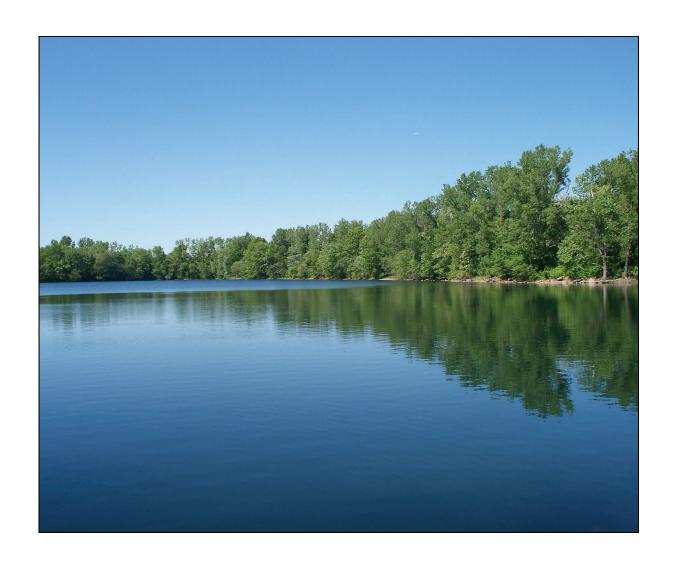
# Pequannock Township

## **Environmental Resource Inventory**



July 20, 2009

### Acknowledgements

Preparation of this Environmental Resource Inventory (ERI) was a joint effort of the Township of Pequannock, the Pequannock Township Environmental Commission, the Pequannock River Coalition and was based on the original ERI created with the assistance of Thonet Associates in 1995. Additional funding for this work was provided by the Association of New Jersey Environmental Commissions.

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### 1. Authorization, Purpose, and Scope

An Environmental Resource Inventory (ERI) is a comprehensive planning document, which describes and analyzes local environmental characteristics and related conditions, primarily for use by various municipal boards and agencies in making land use planning decisions when reviewing development applications and formulating master plans.

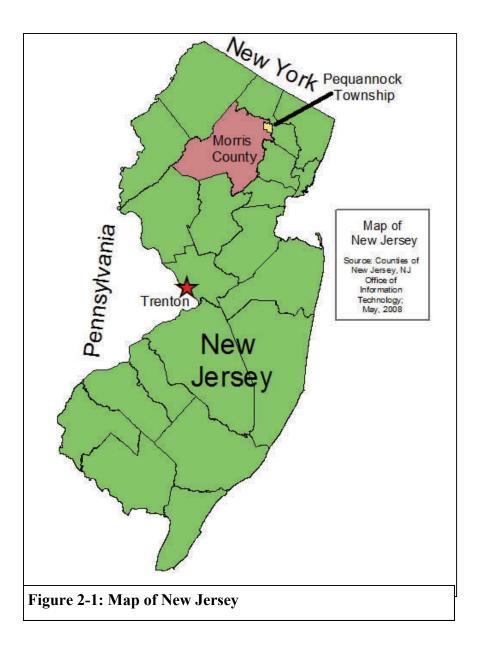
In 2008 the Pequannock Township Environmental Commission determined that the material in their original ERI, created in 1995, had become dated. It was decided to update this information while utilizing the many advancements in computer-based mapping, Geographic Information Systems (GIS), and digitized documents. The goal was to produce a more current document, but also one that would be easier to amend with future revisions.

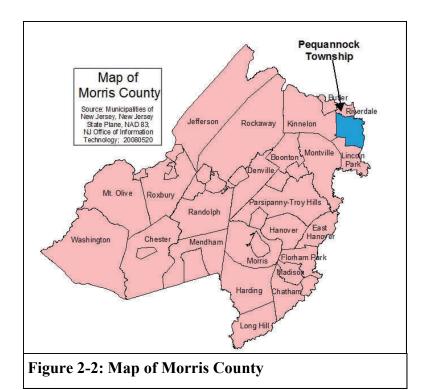
The Pequannock River Coalition, a watershed association operating in Pequannock Township and the 10 other communities of the Pequannock River Watershed, was retained to perform this update. Assistance was provided by the Pequannock Environmental Commission, and funding support in the form of a matching grant from the Association of New Jersey Environmental Commissions. The new ERI was finalized and adopted in x of 2009.

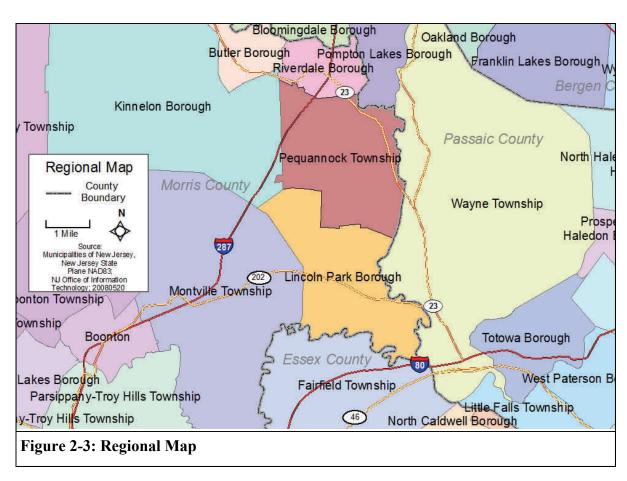
The original ERI was prepared by Thonet Associates, *Environmental Planning and Design Consultants* of South Orange, New Jersey, in accordance with their proposal dated September 29, 1994. Funds for that contract were provided by the Township of Pequannock and the New Jersey Department of Environmental Protection (NJDEP), through a matching grants program administered by NJDEP's Office of Environmental Services (OES).

### 2. General Location and Description

Located in northeastern Morris County, in north central New Jersey, Pequannock Township is 7.04 square miles in area and occupies the fertile ground between the Pequannock and Pompton Rivers to the east and the higher escarpments of the New Jersey Highlands to the west. Within the New York-Northeast New Jersey Metropolitan area, Pequannock borders the Passaic County communities of Wayne Township and Pompton Lakes Borough, and the Morris County communities of Riverdale Borough, Kinnelon Borough, and Lincoln Park Township. Figures 2-1, 2-2, and 2-3 depict Pequannock's location within the state, county, and local area respectively.







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### 3. A Brief History of Pequannock

The first known inhabitants of Pequannock were the Paleo-Indians, followed by the Lenni Lenape. The Lenni Lenape, also known as the Delaware tribe, held most of New Jersey at the time of their initial contact with Europeans. There were three major divisions or subtribes of the Delaware— the Munsee in northern New Jersey and adjacent portions of New York west of the Hudson, the Unalachtigo in northern Delaware, southeastern Pennsylvania, and southern New Jersey, and the Unami in the intermediate territory (including Pequannock), extending to the western end of Long Island. They were gradually crowded west by white settlers, reaching the Allegheny Mountains in Pennsylvania as early as 1724, and settling at points on the Susquehanna River about 1742. Many artifacts of the Lenni Lenape residency have been found throughout Pequannock Township with most findings concentrated near the "East Ditch" in western Pequannock. It is believed that the name Pequannock is derived from a Lenape word meaning, "cleared land ready or being readied for cultivation."

Recorded history began when the European settler's came to inhabit the area and purchased land from the Lenni Lenape peoples. These purchases, made in 1695 and 1697 by Arent Schuyler, Anthony Brocholst, and five other New Amsterdam (New York City) investors, became known as the Pompton Patent. The name "Pompton" is possibly derived from a Lenape word meaning, "a place to catch soft fish" or "a crook in the river." An aerial view of the Pequannock River in the area of Pequannock's Aquatic Park reveals a "Shepherd's crook" in the river there, lending some credence to the crooked-river definition of Pompton.

The Pompton Patent originally encompassed approximately 7,000 acres on both sides of the Pequannock River. The first settlement probably took place in 1710 and was west of the Pompton River. Rich farmland in this part of the region, which was known as the Plains, drew Dutch settlers from New Amsterdam (New York), Acquakannok (Passaic), and Hackensack.

This fertile valley where the Pompton River, Pequannock River and Ramapo River converge provided all that the new settlers needed to maintain a self-sufficient life style, centered solely on farming for their livelihood. They farmed all types of vegetables, grew flax for cloth, and raised livestock, including dairy cows. To help in the processing of many farm products, mills were built including gristmills, carding mills, saw mills, tan bark mills, and distilleries, during the first quarter of the 18th century, using water from these rivers as a source of power.

Industry was introduced to the Pompton Valley after the discovery of large iron deposits in the area, with furnaces built to process it. The first was the Pompton Furnace, built on the original Schuyler Brockholst patent around the year 1726. By the time the American Revolution reached this area of New Jersey, Pequannock Township was in a good position to supply the Revolutionary forces.

In 1740, a year after the formation of Morris County, the General Sessions of Peace met in Morristown. This was the first court set up by the Colonial New Jersey Legislature,

and it divided the newly formed county into three townships, of which Pequannock was the largest. The measurements of incorporation recorded a township 16 miles long by 11 miles wide, containing 74,000 acres. Prior to 1800, little contact took place between the various isolated villages that stretched up and down the few passable roads of Pequannock Township.

Also in 1740, the Morris County Colonial Justices-of-the-Peace appointed the town's first government officials. Subsequently in 1741, the freeholders who attended the annual township meeting elected all public officials. A freeholder was someone who owned land "free and clear." This ownership of land "free and clear" bestowed these people with voting rights as well as the ability to hold office, at least for male landowners. Early government concerns focused on the care of the poor, surveying of land, building and maintaining roads, and runaway livestock. Animal bounties and the ever present issue of tax collection were also concerns of the first town officials.

As the population grew, transportation into and out of the area improved. The first surveyed road into the Pompton Valley was the 1754 King's Highway which followed a north/south route. By 1790, the King's Highway became the "public road through the Plains". It entered the township at the site of the present Route 23 Bridge over the Pompton River, proceeded westward to Jefferson Street, and turned north to join Stoney Brook Road, now known as Mountain Avenue, and ended at Stoney Brook.

During the American Revolutionary War, both Comte de Rochambeau and George Washington's troops camped on what is now the site of the Pequannock Valley Middle School. While Washington stayed at the Schuyler-Colfax House in nearby Pompton, unproven oral history states that he attended church services in the First Reformed Church located in Pompton Plains, also known as the Pompton Meeting House, which had been constructed in 1771. The Grace Chapel of this church still stands along the Newark-Pompton Turnpike. It is a carpenter Gothic style building that served as a Sunday School, and was also used for many other purposes over the years.

The Mandeville Inn, located on the site where the soldiers had camped during the Revolutionary War, was built in 1788. It was first called the Mandeville Farm House and then became the Mandeville Inn in the 19th century. Garret Hobart, Vice President of United States under William McKinley during his first term, owned the Mandeville Inn. The stone with the engraved date of 1788 is now located inside the Pequannock Valley Middle School. The stone was relocated when the Inn was demolished and replaced with the school.

There are some Revolutionary War veterans and at least 75 Civil War veterans buried in the cemetery of the First Reformed Church of Pompton Plains, including African-American Civil War veterans, and a Brev. Brigadier General. John Sanfort, who served in both the American Revolution and War of 1812, is buried here, as are Spanish-American War veterans and veterans of WWI, WWII, Korea, and Vietnam. Among these veterans is James R. Evans, a recipient of the Congressional Medal of Honor. Evans came into town as the station agent at the Pompton Plains Station about 1875. He later became a constable, Justice of the Peace, Post Master, and school board member. He was on the school board that created the Pompton Plains School between 1884 and 1885. The school was torn down

in 1985.

Sunset Road, originally called Bog & Vly Road, was built through Pequannock to Boonton in 1744. This road was the site of some of the oldest homesteads in the Township. In 1789, Jackson Avenue was constructed and named after a popular tavern located at the corner of the new road and what is now called Black Oak Ridge Road in Wayne. In 1874, the Boulevard was constructed as a parallel road to the Turnpike.

The three rivers and the early road system of Pequannock Township and neighboring towns served as a vital transportation network during the Revolution. They connected the north, from Newburgh and West Point, to Philadelphia and Delaware in the south. To control these revolutionary "avenues", a small fortification was built at Federal Hill in Riverdale. During this time of heavy troop movement, Pequannock's hills and mountains served as a signal station for Washington's army.

Pequannock Township was also important during the Revolutionary War because of the "Kings Highway." As stated, this road was created in 1754. By the 1790s it was called the "road through the Plains" and became the Newark-Pompton Turnpike in 1806. It led to today's Rt. 202 or Ramapo Valley Road, a route the British did not control during the Revolutionary War. These roads were used by both American and French troops during this war for independence. During the Revolutionary War, a Liberty Pole was erected on King's Highway, opposite the Dutch Reformed Church as a symbol of support for the Revolutionary forces.

In 1806, the New Jersey State Legislature chartered the Newark-Pompton Turnpike Company. It improved the road and charged tolls for its use until the 1840's. In 1911, the

State took over the Turnpike and numbered the newly paved road State Highway #8 (see Figure 3-1). In 1922, it was renumbered N.J. Highway 23 and paved with concrete from the bridge into Pequannock to Richard's corner in Riverdale. It reverted to a local county road when Route 23 was relocated to the east of the Turnpike in 1935.

In 1811, the State Legislature chartered the Bog & Vly Company to construct a system of drainage ditches to improve farming in the Plains. These ditches are now referred to as the "East Ditch" and "West Ditch". Soil from the ditches was used to lay the roadbed for the current Jacksonville Road.



Figure 3-1: Bridge On Newark Pompton Turnpike In Pequannock Shows Relic Of State Highway 8

Beginning in 1831 the Morris Canal's feeder canal became another route into the Plains. The Township's portion of Aquatic Park contains a remnant of a reservoir that once fed water to the canal, and the remains of the northernmost lock are visible, though located on the Wayne side of the Pompton River.

Commerce and industry boomed during this time as a result. Farmers could now market the products they produced by transporting them to the cities. The new Canal, coupled with the growth of the iron industry along the Pequannock River, led to many jobs and resulted in population growth throughout the area.

Pequannock Township originally covered 176 square miles, but was steadily reduced in size over the many years since it was formed. This began in 1844 with the secession of Rockaway Township. In 1867, Boonton and Montville seceded, followed by the boroughs of Lincoln Park, Kinnelon, Butler, and Riverdale. By the 1920's, Pequannock Township was reduced to only the sections of Pequannock and Pompton Plains. Cedar Crest Village, a large housing development first opened in August 2001, required the purchase of some land from Riverdale and this brought Pequannock Township's current size to about 7.04 square miles.

In the early 1870's, the New York and Greenwood Lake Railway came to



Figure 3-2: Early Map of Pequannock (Source: "Historic Pequannock Township" by Emil R. Salvini. 1987.)

Pequannock Township. Two stations were built: one in Pompton Plains along Jackson Avenue and the other in Pequannock where the railroad tracks now cross the Newark-Pompton Turnpike. Eventually, telegraphs were installed at both stations giving Pequannock an instantaneous connection with the outside world. The railroad was original called the Montclair Railway, then the New York Greenwood Lake Railway, then the Erie Greenwood Lake Division. Today, the New York-Susquehanna and Western Railroad own this land. Commuter service on the railroad lasted until 1966. Freight service continues now on a limited section of the line.

Pequannock's first schoolhouse was built prior to 1800 in what is now Pompton Plains. It stood approximately where the Grace Chapel of the First Reformed Church now stands on the Newark-Pompton Turnpike. A second school was erected about a half mile north of the first school. Another new school was built on property located across the street from the original schoolhouse in 1824. This frame building served the community until 1872, when it was moved from the property so that a new brick school could be built. The frame building was moved further north on the Turnpike; it still stands in a remodeled form at 602 Newark-Pompton Turnpike. The structure outlived its successor, the 1884 Pompton Plains School, which, after two additions in 1923 and 1928, was torn down in 1985 to make way for the new Pompton Plains Post Office.

In 1923, the Pequannock Elementary School was built on Oak Avenue. It was enlarged in 1928 and again in 1963. It served in this role for many years until it was sold to the Boys and Girls Club of Morristown. The Pequannock Valley Middle School was erected in 1950 on the site of the circa 1790 Mandeville Inn. Additions were later made to this school. Other schools now include North Boulevard Elementary School, built in 1954, Pequannock Township High School, in 1959, Hillview School in 1963, and Stephen J. Gerace Elementary School in 1969.

Religion has played an important part in the town's history and development. The First Dutch Reformed Church was organized in 1736 and much of the Township's early history was recorded by this church. The first church building was constructed in 1760 and was located opposite the Thomas Mandeville house, at 679 Newark-Pompton Turnpike, Pompton Plains. It was used for approximately eleven years when, in 1771, a new church was erected at its present site.

The history of the town library began in 1913 when a group of concerned citizens, calling themselves the Neighborhood Club, began the Pompton Plains Library in an unused real estate office just north of Poplar Avenue where Friendly's Restaurant is currently located. In 1925, it moved to the First Reformed Church's Grace Chapel building. Later, in 1931, a Pequannock Branch was started and since closed. In 1962, the Pequannock Public Library was moved to the municipal building. Then in 1997, the Pequannock Public Library moved into its own building on Newark Pompton Turnpike next to the Pequannock Valley Middle School.

In 1817 a citizen's group organized to protect property, and in 1896 the first police force came into being. By 1936 the police department purchased it's first police car. And had a one-way radio hook-up with the Bergen County police. In 1955, 24-hour desk

service was instituted. Volunteer Fire companies were formed in 1915 and 1923 in Pompton Plains and Pequannock, respectively. After World War II the township began to create the various parks in town.

The regional road system, depicted in Figure 2-3, shows that State Highway Route 23 traverses Pequannock in a north/south direction. Route 23 connects to the east with Interstate Highway 80, and State Highway Route 46 for intra- and inter-regional travel. Interstate Highway 287 crosses the northwest corner of the Township and is accessed from an interchange on Route 23 in nearby Riverdale.

Throughout the 1950's and 1960's, Pequannock was on the fringe of the development in the older, more densely populated areas of Passaic, Bergen, and Essex Counties. Because the high elevations to the west isolated Pequannock from the remainder of Morris County, development pressure came from Paterson and Newark via the Newark-Pompton Turnpike and Route 23, more closely matching patterns in Passaic County than Morris. While both Pequannock and Morris County grew in the post-war era of the 1950's, Pequannock continued this growth through the 1960's, while development in the rest of Morris County slowed. Correspondingly, in the 1970's, with the construction of Interstate Highway Routes 80, 280, and 287, and the relocation of many business and corporate headquarters to large, readily developable parcels along these highways, the remainder of Morris County came under considerable development pressures that did not affect Pequannock.

The relocation of employment centers and major shopping centers to highways throughout suburban New Jersey has changed Pequannock's relationship to the surrounding region. On November 19, 1993, after nearly four decades of planning and construction, the entire 66.9-mile length of I-287 was opened to traffic. In the year after I-287 opened, some \$75 million worth of new housing, retail and office buildings construction took place along the route.

Pequannock Township is primarily a suburban "bedroom community" of large numbers of commuters who travel to larger urban centers. For shopping, commuting to work, and to New York City, township residents travel along Routes 23, 46, 80 and 287. Within Pequannock, Chilton Memorial Hospital draws employees from the larger region, and the numerous stores and services along Route 23 draw consumers from many areas outside the Township. There are three business districts in town, the Pequannock and Pompton Plains Business Districts along Newark Pompton Turnpike and a highway business district along Route 23. Four areas are zoned for industrial use, including lands along West Parkway near Route 23, along Alexander Avenue, along Industrial Avenue, and along the southern part of Beaver Brook Road, with extensive industry on West Parkway and Alexander Avenue.

The most recent development to impact Pequannock was the creation of Cedar Crest Village, an age-restricted community in the northwest portion of the Township. The community consists of more than 1,500 dwelling units including three 2-story community buildings, 12 residential buildings, a chapel, parking structures and an extended care facility sited on 143 acres.

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### 4. Demographics and Land Uses

According to the US Census Bureau, in 2000 there were 13,888 people residing in Pequannock Township's 7.04 square miles of land, for an overall population density of about 1,970 people per square mile. The most recent estimates from the Census Bureau indicate that Pequannock's population was approximately 16,769 in 2007, a 21 percent increase from 2000, or an approximately 3 percent increase each year during that period. As shown in Table 4-1, this is the most rapid increase since the 1950s, when population increased about 10 percent annually. Much of this increase is associated with Cedar Crest Village, a senior living center located in the northernmost section of town.

At the time of the last census (2000), Pequannock's population growth of 8 percent since 1990 was slightly lower than the Morris County average of about 12 percent. Figure 4-1 presents a graphic illustration of the growth rates for municipalities in Morris County from 1990 to 2000.

The Census Bureau information indicates that, in 2000, the township consisted of 5,026 households and 3,829 families. The average household size was 2.76 and the average family size was 3.23 people. About 65.5 percent of households consisted of married couples living together, 35.6 percent of households had children under the age of 18, 7.8 percent of households had a female householder with no husband present, and 23.8 percent of households were non-families. About 20.9 percent of all households were made up of individuals and 8.8 percent had someone living alone who was 65 years of age or older. The median age in the township was 39, and the population distribution included 25.9 percent under age 18, 5.8 percent from 18 to 24, 29.6 percent from 25 to 44, 24.6 percent from 45 to 64, and 14.1 percent at 65 years of age or older.

Table 4-1: Population of Pequannock Township 1950 to 2007			
Year	Population	% Change from previous decade	
1950	5,254	+84	
1960	10,553	+101	
1970	14,350	+36	
1980	13,776	-4	
1990	12,844	-7	
2000	13,888	+8	
2007	16,769	+21	

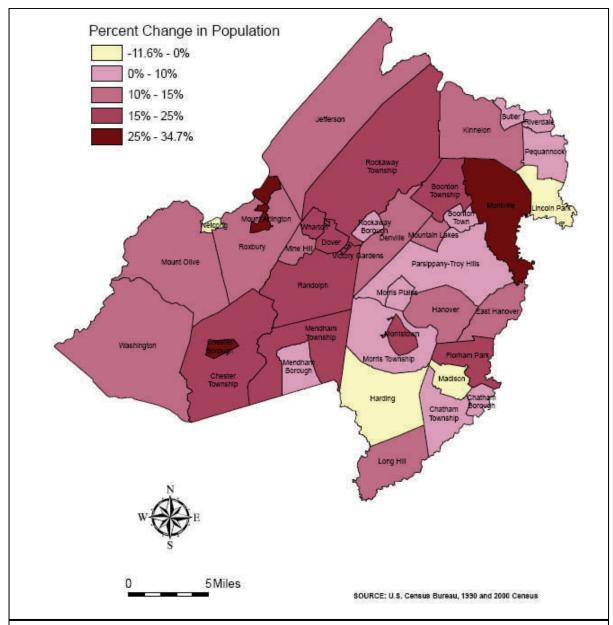
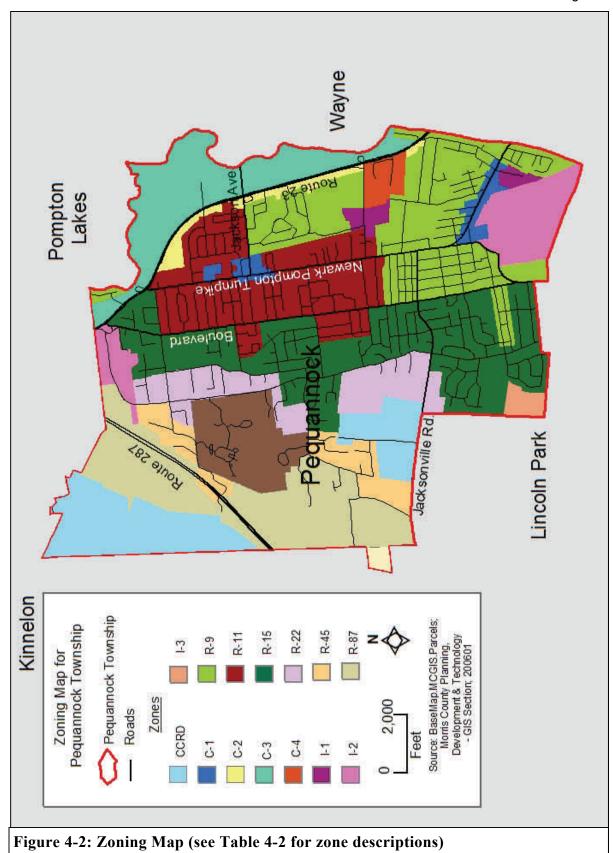


Figure 4-1: Morris County Population Change By Municipality, 1990-2000

Pequannock Township's largest single land use is residential properties. Table 4-3 provides an approximate breakdown of Pequannock's existing land uses. As shown, over 45 percent of the township's total area is devoted to residential properties. Another 30 percent is open space in the form of either vacant, agricultural, or park land. Public buildings and grounds, schools, and quasi-public entities (such as churches and charitables) account for another 5 percent. Commercial, industrial, and utilities properties account for approximately 10 percent, and streets and highways account for the remaining 10 percent.

The existing land uses described above often vary somewhat from the zoning that has been established in specific areas, particularly with respect to lands used for municipal or government uses, parks or open space, and lands in agricultural use. Of Pequannock Township's total acreage, approximately 70 percent is zoned for residential use, and 18 percent as commercial or industrial. A current zoning map is provided as Figure 4-2. This data is also provided in tabular form in Table 4-2.

Table 4-2: Township Acreage by Zone			
Map Code	Category	Acreage	Percent of total
CCRD	Continuing Care Retirement District	283	6.6
C-1	Community Business District	72	1.7
C-2	Highway Commercial District	65	1.5
C-3	Regional Commercial District	379	8.8
C-4	Regional Commercial District	51	1.2
I-1	1 Acre Industrial District	44	1.0
I-2	2 Acre Industrial District	233	5.0
I-3	3 Acre Industrial District	30	0.7
R-9	1/5 Acre Residential	688	16.0
R-11	1/4 Acre Residential	556	12.9
R-15	1/3 Acre Residential	788	18.3
R-22	1/2 Acre Residential	275	6.4
R-45	1 Acre Residential	168	3.9
R-87	2 Acre Residential	670	15.6



Pequannock Township Environmental Resource Inventory

Table 4-3: Township Acreage by Land Use (based on 4,563 acres total			
Land Use	Acres <sup>(1)</sup>	Percent of Total Land	
Residential	2,088	45.8%	55.1%
Single Family	1,940	42.5%	51.2%
Multi Family	148	3.2%	3.9%
Commercial	224	4.9%	5.9%
Industrial	195	4.3%	5.1%
Park Land	341	7.5%	9.0%
Municipal	182	4.0%	4.8%
County (Morris and Passaic)	159	3.5%	4.2%
Public Buildings and Grounds	13	0.3%	0.3%
Schools	80	1.8%	2.1%
Public	69	1.5%	1.8%
Other	11	0.2%	0.3%
Quasi-Public	109	2.4%	2.9%
Churches and Charitables	96	2.1%	2.5%
Other Exempt	13	0.3%	0.3%
Utilities	33	0.7%	0.9%
Agricultural	236	5.2%	6.2%
Streets and Highways <sup>(2)</sup>	468	10.3%	12.4%
Subtotal Developed	3,787	83%	100%
Vacant	776	17.0%	n/a
Municipal	363	8.0%	n/a
State	27	0.6%	n/a
Other	386	8.5%	n/a
Subtotal Undeveloped	776	17.0%	n/a
Total	4,563	100%	n/a

**Notes:** (1) All acreages are approximate and include areas of water (173 acres). (2) Based on 1993 calculation; updated values not available.

The Historic Landmark District is an overlay zone representing the Martin Berry house and grounds (see map in Figure 4-4). This house, circa 1720, is the only structure in Pequannock to be on the National Register of Historic Places (see Figure 4-3).

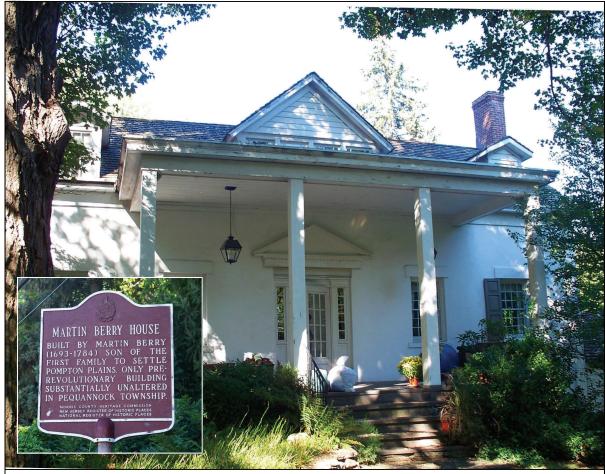
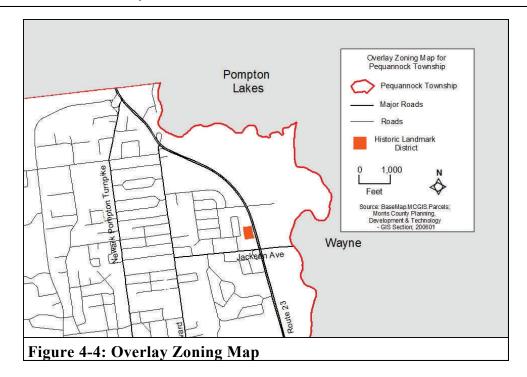


Figure 4-3: Martin Berry House



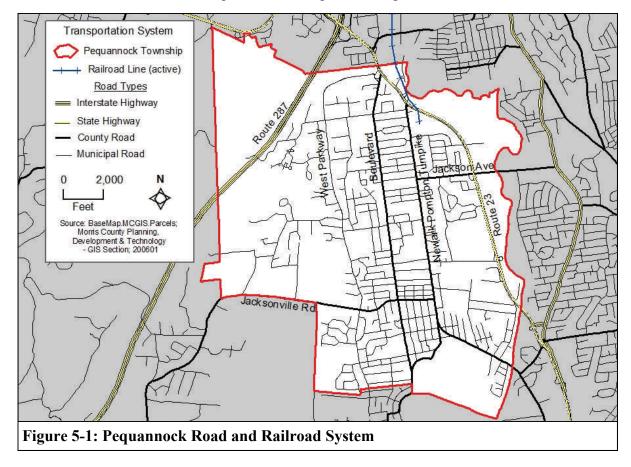
### 5. Existing and Planned Infrastructure

The term "infrastructure" can be defined as those facilities or structures that are necessary to support a society. In Pequannock that includes roads, sewers, water supplies and a number of other components.

#### 5-I. Transportation

According to data collected by the U.S. Census Bureau in 2000, about 90% of Pequannock residents travel to work using automobiles. Therefore, transportation in Pequannock relies largely on its road system. The road system in Pequannock Township ranges from roads developed in the 18th century to modern highways that were completed in the last decade. At this point the road system may be considered mature with no major changes envisioned in the near future. These roads are controlled and maintained either by the state, the county or by local government.

Aside from road transport, there is a freight rail line of the New York-Susquehanna and Western Railroad that continues to operate a rail spur in the northern portion of the township, servicing Morris Pipe and Supply, Inc. (a division of Morris Industries, Inc.). Although the railroad easement continues south and crosses the Pompton River at a bridge near the extreme southeastern border of township, most of its length is no longer in service. The roads and active rail lines of Pequannock are depicted in Figure 5-1.



#### 5-II. Water Supply

Like all communities, the residents of Pequannock require an ample supply of potable water, for a variety of residential and commercial uses. The overwhelming majority of users in the Township obtain water supplied by Pequannock's municipal water system: more than 96 percent of residences and some 360 commercial, 8 industrial, and 9 municipal users. The remainder obtain their water from private wells.

Pequannock distributes water obtained both from wells located within the township and from a reservoir system in the Pequannock River watershed that is owned by the City of Newark and has two interconnections with the Township's water supply. The purpose of these interconnections is to supplement the Township's supply during high-demand periods and emergencies. In 2007, approximately 78 percent of the water distributed by the Township originated from the wells, and 22 percent was obtained from interconnections with the Newark system. The Township also has interconnections to supply water to both Lincoln Park (which purchases water in bulk from Pequannock) and to Riverdale (for emergency supply to Riverdale).

A one million gallon water storage tank and booster station was built off Robert Place in Greenview Park. The storage tank contains additional water for peak periods and emergencies as required by state law. There is another booster pump station on Jacksonville Road that serves a high pressure zone located on the upper parts of Sunset Road. Existing loop mains equalize pressure and distribution, and more may be required if development continues in this area.

Pequannock's three wells are located in the northern part of the Township, off of the Boulevard, Ridge Road, and West Parkway (see Figure 5-2). As discussed in the section on Groundwater Quality, the public wells have two water-quality issues—excessive hardness and high sodium levels. Of these, the high sodium levels are the more pressing concern due to the associated health risks that these pose to some residents. As noted, the sources of high sodium levels in groundwater are often associated with road salts. This can result from improper storage of these salts, or runoff from salt-treated roads. In Pequannock, road salt is stored at the DPW facility at Alexander Avenue, far from the public wells, so this storage is not a likely source.

As shown in the aerial view in Figure 5-2, there are extensive roads and parking lots, including Rt. 287, in the area of Pequannock's wells. The Malcolm Pirnie report, published in 1980, discussed the potential influence of Rt. 287 on these wells. The report stated that "A preliminary study conducted by the New Jersey Department of Transportation (N.J. DOT) suggests that the major source of possible contamination is from salts used in highway deicing operations. These include sodium chloride and calcium chloride. "Although the N.J. DOT concluded that "...contamination of any water resources, either ground or surface waters, in the vicinity of the proposed highway would not occur."

The study seemed to concentrate more on surface water than groundwater quality. Nonetheless, the contamination has occurred. However, without additional study it is

impossible to determine whether the source of this sodium contamination is Rt. 287, local roads, parking lots, sources beyond Pequannock's borders, or a combination of these.

Although dilution of the Township's well water is being pursued as a way of correcting this, another means may be attempting to address the sodium at its source. Groundwater contamination from sodium is not a problem unique to Pequannock. The USEPA has prepared a document dealing with this specific issue, entitled "Managing Highway Deicing to Prevent Contamination of Drinking Water." This document lists a number of measures that may be employed to reduce or eliminate these problems, such as the use of alternative deicing chemicals, anti-icing or pre-treatment, changes in spreading rates, improving the timing of application, or use of superior application equipment. The full document is attached here as Appendix A.

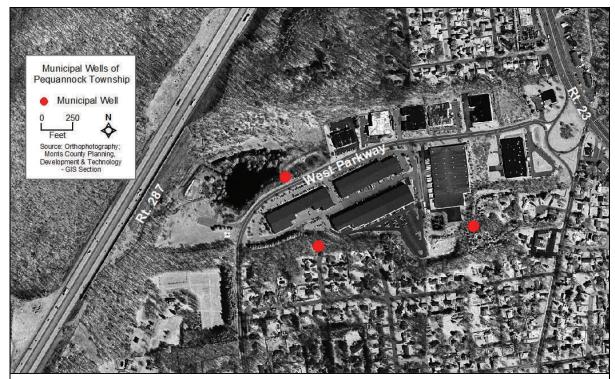


Figure 5-2: Municipal Wells of Pequannock Township



Figure 5-3: Area Around Municipal Wells of Pequannock Township (looking east)

#### 5-III. Wastewater

Pequannock's wastewater consists of domestic sewage, as well as wastewater generated by public institutions and by commercial and light-industrial uses. Wastewater from homes consists of sanitary sewage (uses associated with toilets, bathing, clothes washing, and dishwashing) and contains solids, oxygen-demanding materials, nutrients (phosphorus and nitrogen), pathogens (bacteria and viruses), and other pollutants associated with various activities. Wastewater from public institutions (such as schools), commercial establishments, and industrial uses also contains sanitary sewage along with other waste chemicals and pollutants associated with the activities conducted by the particular establishment.

In 1970, through simultaneous ordinances, the municipalities of Pequannock, Lincoln Park and Fairfield established the Pequannock, Lincoln Park and Fairfield Sewerage Authority, commonly known as the Two Bridges Sewer Authority (TBSA). Pequannock adopted subsequent ordinances governing TBSA were in 1982, 1985, 2005 and 2009. Construction of the TBSA sewage treatment facilities was completed in 1978, and an advanced-treatment stage for nitrogen removal was completed in 1982. Located in the Two Bridges section of Lincoln Park, TBSA's treatment facilities in Lincoln Park and Fairfield discharge treated sewage to the Pompton River near its confluence with the Passaic River. A New Jersey Pollution Discharge Elimination System (NJPDES) permit specifies the allowable capacity and required quality of effluent discharged from the treatment facilities. The permitted treatment capacity of the combined facilities is 7.5 million gallons per day (mgd), although at present only about 2.47 mgd of that capacity is being utilized. Pequannock has contracted for 1.25 mgd, but currently uses about 600,000 gallons per day (0.6 mgd) with about 1,090 connections.

Treatment of wastewater at the TBSA treatment facilities requires a sanitary sewer network to convey the wastewater from the source. At present, only a portion of the township is served by the sanitary sewer network. Figure 5.4 shows which areas of Pequannock are now served by a sanitary sewer network versus areas that are undeveloped or served by onsite wastewater treatment systems. As described below, planning is underway to expand the sanitary sewer network through construction of sewers in some previously unsewered areas. Once a sanitary sewer is constructed, Pequannock ordinances require adjacent properties to connect to that sanitary sewer network within a relatively short period of time.

As shown on Figure 5.4, approximately two thirds of homes in Pequannock rely on onsite wastewater treatment systems, commonly known as "septic systems." When properly designed, installed, operated, and maintained, septic systems can be the most cost-effective method of wastewater treatment, removing solids, pathogens (bacteria and viruses), and nutrients (phosphorus and nitrogen) before these contaminants reach the groundwater. One benefit of septic systems is that they help replenish groundwater and maintain stream flows by keeping used wastewater close to the source rather than exporting that water to a sewage treatment plant that discharges far from the water source.

Although properly maintained septic systems can last for the life of the home,

improperly operated systems will fail and pose a concern to the environment. For example, if homeowners improperly dispose of toxic chemicals down their drains, these chemicals can disrupt the treatment process of the septic system and are likely to end up entering the groundwater. In addition, if homeowners do not have their septics pumped with the proper frequency (typically every 2 to 3 years), the system drainage field will eventually clog and fail to properly treat contaminants.

Even properly functioning septic systems can sometimes pollute water, primarily through the release of nitrates (a form of nitrogen that can be toxic in high concentrations). Nitrates from septic systems can flow to surface water or wells via the groundwater, and if the groundwater recharge is not sufficient to dilute the nitrates to acceptable levels, the nitrates can pose a health hazard. Nitrates can also enter the groundwater due to fertilizer use on lawns. According to Pequannock's annual water quality reports (see Appendix D), nitrate levels have been well within acceptable limits, but nitrate levels have been rising over the years.

Onsite wastewater treatment systems can also serve industrial and commercial uses. However, these non-household applications may involve toxic chemicals and high or irregular usage patterns, and so NJ state law, known as Chapter 199, revised in the 1980's, contains strict constraints on such systems for industrial and commercial uses. A New Jersey Pollution Discharge Elimination System (NJPDES) permit for non-domestic uses of septic systems is now required by NJDEP, and this regulation significantly increases the cost of repairing and maintaining existing non-domestic septic systems.

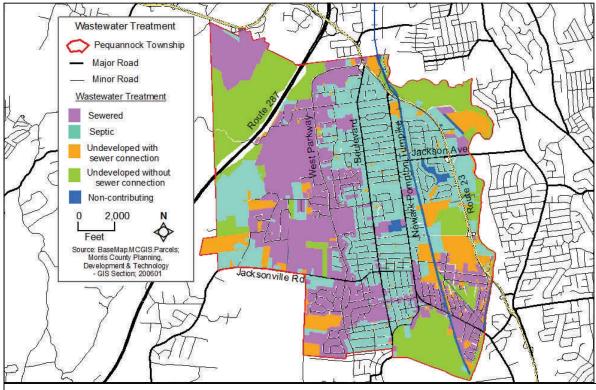


Figure 5-4: Wastewater Treatment in Pequannock Township

Conditions in certain sections of Pequannock are not suitable for conventional septic systems. Pequannock's Master Plan has designated certain sections of town to remain on septic, with other areas to become sewered. In 2008, the township completed two sewer-service expansions, one in the southeastern Pequannock section and another in the Munson Road / Farm Road area in the southwest section of town. A third expansion for the "Village" section of town (roughly, east of Newark Pompton Turnpike to Rt. 23, from Jackson Avenue south to Alexander Avenue) is currently in the planning stage.

#### 5-IV. Floods, Flood Control and Stormwater Management

Stormwater runoff can occur when rain or snow melt falls on a surface through which the water cannot fully infiltrate. Impervious surfaces (such as roofs, streets, sidewalks, and parking lots) typically generate much more runoff than pervious surfaces (such as forests, lawns, gravel, or porous pavement), though even pervious surfaces can generate significant runoff if they are already saturated. The amount of runoff also depends on the amount and duration of the rainfall (or snow melt).

To avoid street flooding and other localized problems in developed areas, stormwater runoff is managed through drainage systems. In the past, most of these systems were designed to convey the runoff directly to a nearby ditch or stream. A common example is a storm drain along a roadway: runoff enters the drain through a grate and into an underground chamber known as a catch basin, which is connected to an underground pipe called a storm sewer. The storm sewer ultimately discharges to a surface waterbody such as a stream.

Today, however, a variety of methods are used to increase the infiltration of this stormwater and improve its quality. The New Jersey Stormwater Management Rules at N.J.A.C. 7:8 govern the management of stormwater. Specifics on these rules are provided later in this section. In addition, the state has provided a manual to assist in the proper control of stormwater, titled the New Jersey Stormwater Best Management Practices Manual

As runoff flows across lawns or pavement, it can pick up contaminants from these surfaces. Lawn pesticides and fertilizers, automobile oils and antifreeze, litter, animal droppings, and eroded soil solids are common examples of pollution that can be conveyed by stormwater runoff. A variety of devices, including filters, ponds, and basins can be designed to capture solids, filter pollutants, infiltrate the stormwater and trap substances such as oils. Maintenance of such systems can be difficult and/or costly. One of the best ways of reducing pollution from stormwater runoff is limiting the material that finds its way into the runoff initially. For example, the proper use of pesticides and fertilizers is important. Pequannock recently adopted an ordinance requiring the proper use of lawn chemicals to control levels of phosphorus discharging to its surface waters.

Although floods are a natural phenomenon, they can be exacerbated by manmade changes to land use. For example, the increase of impervious cover—roads, buildings, and parking lots—can reduce groundwater recharge when rainfalls occur. At the same time, the impervious cover channels the same water, known as stormwater, to rivers and streams, increasing the likelihood and magnitude of flooding. The filling and development of low-lying floodplain areas that would store floodwaters during floods, can also cause or increase problems.

For many years the state of New Jersey has sought to regulate and manage floodplains while supporting similar efforts at the Federal level by working with the Federal Emergency Management Agency (FEMA).

The following description of these efforts is taken from the NJDEP website:

"In 1929, N.J.S.A. 58:1-26 authorized a state agency to regulate structures within the natural and ordinary high water mark. In 1962, a second law N.J.S.A 58:16A(50-54), was adopted authorizing the Division of Water Policy and Supply, to study flood plain areas and to delineate such area by resolution. In 1972, the legislature adopted a third statue amending the 1962 Act which authorized the Division of Water Policy and Supply to delineate and mark flood hazard areas and to adopt regulations for these areas. Under the 1972 Act, N.J.S.A. 58:16A (50-66), the Department is authorized to adopt Floodway regulations and to promulgate minimum standards for local rules and regulations concerning development in Flood Fringe areas.

The Division of Water Policy and Supply, now the NJ Department of Environmental Protection was authorized "to adopt land use regulations for the flood hazard area, to control stream encroachments, to coordinate effectively the development, dissemination, and use of information on floods and flood damages." The state's approach to effectively providing this information was to develop flood hazard area maps. The New Jersey maps predated the Federal maps and indicate the special flood hazard area or 100-year flood and the floodway that the Federal maps eventually showed but also delineates the New Jersey Flood Hazard Design Flood, based on discharge 25% larger than the 100-year flood discharge. As these maps preceded similar efforts at the federal level, they help demonstrate the history and depth of the State of New Jersey's commitment to flood plain management.

FEMA has moved in the direction of a five-year digital map modernization program, based on countywide studies rather than municipal studies. The countywide studies insure agreement between municipalities, provides a digital environment to allow for easier revisions and updates, and includes original delineations with more recent updated delineations.

New Jersey's current FEMA maps are in the process of being updated. The bulk of the state's effective maps are more than 16 years old and only a handful of New Jersey's almost 550 National Flood Insurance Program (NFIP) communities are currently in the digital format. The manual cartographic methods, used to develop most of the state's maps, limit the application of the data. New Jersey seeks to maintain and incrementally grow its role in project management and community outreach for Map Modernization. It will continue to work with established partners at the Federal level, like the US Army Corps of Engineers (USACE), United State Geological Survey (USGS), and Natural Resources Conservation Service (NRCS), while building partnerships at the municipal level for data development and program oversight.

The state envisions its NFIP coordinator, the New Jersey Department of Environmental Protection (NJDEP), as well as its Office of GIS (NJOGIS), working together with FEMA to develop the spatial data needed to support the development of updated, highly accurate flood hazard data. With FEMA support we are developing statewide elevation data that should reduce the cost of developing new hydraulic analyses. This data, when coupled with the statewide orthophotography produced by NJOGIS, will perform an excellent platform on which to build next generation of FEMA and State flood mapping.

New Jersey will continue to take the lead in prioritizing projects, coordinating available data sources and conducting the outreach; all essential components in the data production and map adoption components of the program. FEMA, in the state's plan, would retain responsibility for actually developing the new floodplain data, producing Digital Flood Insurance Rate Maps (DFIRMs) and assisting in the post-preliminary process.

New Jersey seeks to integrate its mapping program with the FEMA program. This integration hinges on creating FEMA FIRMs for New Jersey, which delineates the New Jersey Flood Hazard Area (NJFHA). The flood hazard area, computed by using 100-year discharge plus 25%, may be simply a digital layer, but it is the state's regulatory standard. Currently, because FEMA FIRMs do not have this data, the state is bound to maintain and update its own state maps each time FEMA updates its maps. This is an arduous process and necessitates some duplication of effort. By including the NJFHA on the DFIRM, the state would be able to use the FEMA DFIRMs as the single source for both Federal and state flood plain management, freeing up staff resources and increasing efficiency. "

Appendix B includes the existing NJDEP "Floodway and Flood Hazard Area" maps developed in the 1980s for the streams and rivers in Pequannock.

On the Federal side, FEMA prepared a Flood Insurance Study (FIS) in 1986 for Pequannock, in which detailed hydrologic analyses were prepared for the Pompton, the Pequannock, and the Ramapo Rivers, the East and West Ditches, and the tributary to the East Ditch, to establish the peak discharge-frequency relationships. Discharge-frequency data for the Pompton River were based on discharges calculated by the United States Geological Survey (USGS). The calculations followed the standard log-Pearson Type III analysis recommended by the Water Resources Council, which included weighting stations and regional skew.

For the other streams studied, hydrologic analyses were based on the method for estimating flood peak magnitudes as described in New Jersey's Special Report #38. This method is based on a multiple regression analysis used to develop mathematical relationships between flood discharges at the various reference intervals (2-year, 10-year, 50-year, and 100-year) obtained from gauging station data and the hydrologic characteristics of the watersheds. Flood information from 103 sites was used in making the analysis. Hydrologic parameters included stream drainage area, main channel slope, surface storage area, and an index of man-made impervious cover basin on basin population and development conditions. The 500-year discharge value was extrapolated from the lower frequency floods.

Hydraulic analyses of Pequannock's streams were carried out by FEMA to estimate the flood elevations for storms at selected recurrence intervals. Cross-section data for the hydraulic analyses were obtained from aerial photographs and below water sections were obtained by field measurement. Cross-sections were located at close intervals above and below bridges and culverts in order to compute the significant backwater effects of these structures in the highly urbanized areas. All bridges and culverts were field surveyed to obtain elevation points and structural geometry.

Water surface elevations of floods of the selected recurrence intervals were computed using the US Army Corps of Engineers (COE) HEC-2 step-backwater computer program.

Flood profiles were drawn showing computed water surface elevations for the 10-year, 50-year, 100-year, and 500-year floods.

For the purposes of the National Flood Insurance Program, a floodway is used as a tool to assist the local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a flood fringe.

The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to one foot, provided that hazardous velocities are not produced. However, since New Jersey has established criteria limiting the increase in flood heights to two-tenths of a foot, floodways having no more than two-tenths of a foot surcharge were delineated for the Pequannock FIS, and these floodways have been adopted by NJDEP. As noted, these floodway maps are included in Appendix B.

The floodways presented were computed for certain stream segments on the basis of equal conveyance reduction from each side of the flood plain. Floodway widths were computed at cross-sections. Between cross-sections, the floodway boundaries were interpolated. In cases where the floodway and the 100-year flood plain boundaries are either close together or co-linear, only the floodway boundary is shown. Portions of the floodway widths for the Pompton, the Pequannock, and the Ramapo Rivers, and the West Ditch, extend beyond the corporate limits of the Township.

The area between the floodway and NJDEP's Flood Hazard Area boundaries is termed the flood fringe. The flood fringe encompasses that portion of the flood plain that could be completely obstructed without increasing the water surface elevation of the 100 -year flood more that 0.2 foot at any point, assuming that such encroachment did not result in an increase in the magnitude of the peak flows.

On the local level, floods have been documented in Pequannock since the turn of the century. In 1955, Pequannock tried to establish a flood zone prohibiting construction within 100 feet of a river bank, but this effort was successfully challenged in court. After the Memorial Day flood in 1968, Pequannock tried again to establish a flood zone based on observed elevations of that flood. Fortunately in that same year, the National Flood Insurance Act was passed, and the Federal Emergency Management Agency (FEMA) began delineating the flood plain.

In 1978 Pequannock passed a comprehensive Flood Damage Prevention Ordinance. This ordinance prohibits construction in the floodway and requires that new construction in the flood plain must have its first floor two feet above the base flood elevation. It also prohibits basements, requires flood proofing of commercial structures and utilities, and established construction guidelines to reduce flood damage and eliminate obstructions to flood waters.

These local measures are supported by state laws such as the Flood Hazard Control Act Rules (N.J.A.C. 7:13) and the Stormwater Management Rules, that require stream encroachment permits for placing fill in flood plains, require recharge of stormwater, and

demand reductions in the peak flow of runoff from sites after development.

Under the Flood Hazard Control Act Rules, development activities that displace floodwaters, if allowed, must compensate by creating additional flood storage. The rules surrounding this are complex and can vary site to site.

Rules surrounding the management of stormwater have evolved over time. In January 1992, a revised stormwater management ordinance was adopted by the Pequannock Council to address the first phase of the guidelines established by the NJ Stormwater Management Act of 1988. The new ordinance regulates the impact of runoff caused by new development and provides a means of review and inspection for existing public and private facilities. Pequannock also has entered into an agreement with the Morris County Soil Conservation District for sediment and soil erosion control.

In 2004 two new sets of stormwater rules were adopted by the state. Together these two sets of rules established a comprehensive framework for addressing water quality impacts associated with existing and future stormwater discharges.

The first set of rules are the Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A). These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s.

Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.

The second set of rules are known as the Stormwater Management rules (N.J.A.C. 7:8). These rules set forth the required components of regional and municipal stormwater management plans, and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, runoff quality controls, and buffers around Category One (C1) waters.

The rules emphasize, as a primary consideration, the use of non-structural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control and a Special Water Resource Protection Area (SWRPA)

or 300 foot buffer adjacent to Category One (C1) waters and their immediate tributaries. Currently there are no C1 waterways in Pequannock Township.

Only new development that will ultimately result in the disturbance of one or more acres of land, or increased impervious surface by one-quarter acre or more (i.e. "major development") and is not exempt from the rules, must comply with the rules. New development with cumulative impacts below these thresholds, major development that is specifically exempted under the rules and development that does not require any local or Division of Land Use Regulation permits are not required to comply with these rules.

Pequannock adopted ordinances in 2008 to implement these requirements.

Another initiative directed at flood control is the "Blue Acres" program. After the 1984 flood, the NJ State Division of Water Resources and FEMA provided funding for the purchase of residences within the Passaic River Basin Floodway. In Pequannock, this program allowed the purchase and removal of 61 houses in the floodway. At the time of this writing, 31 of these home sites are owned by Pequannock Township, 14 by the NJ Department of Environmental Protection and 1 by the NJ Department of Transportation. 46 remain in private ownership. Although the program has been suspended due to termination of funds, the township supports the concept and will reinstate it if funding becomes available.

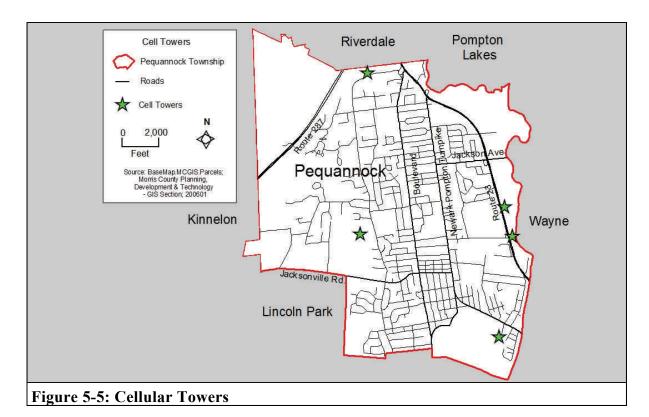
In an effort to improve the township's ability to monitor the condition of the streams, culverts, and flood-control gates, the Pequannock Town Council requested that the Environmental Commission conduct inspections of the township's streams to document the condition of the streams and to note issues such as potential desnagging requirements (e.g., the presence of trees or other debris in the waterways that could potentially inhibit flow and contribute to flooding), potential problems with culverts and backflow-prevention gates, general litter levels in and around the waterways, general access issues that may be of concern for a clean-up operation, and other potential issues. These ongoing inspections started in 2008 and the inspection reports that have been completed to date are provided in Appendix H. It is anticipated that additional inspection reports will be added as they are completed in the future.

#### 5-V. Utilities

Within Pequannock Township, gas, electric, cable television and telephone service are provided by Public Service Electric and Gas, Jersey Central Power and Light, TCI of Northern New Jersey, and Bell Atlantic - New Jersey, respectively. The maintenance and extension of these services is not dependent upon municipal finances. In the case of subdivisions and site plans, the utilities are extended at the expense of the developer and/or the utility company.

The Township's Land Development Ordinances require that all new utility extensions be constructed underground. When major capital improvements are planned by public and private concerns, consideration should be given to relocating existing overhead utilities. underground. However, there is no requirement for existing overhead utilities to be placed underground at this time.

In recent years the proliferation of cellular communication and cellular towers has had an impact on the visual landscape of Pequannock Township. In all, 5 cellular towers are located in the township. Their locations are shown in Figure 5-5.



Pequannock Township Environmental Resource Inventory

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## 6. Topography

Topographic information is useful for a variety of reasons, as a physical description of the landscape; to determine elevations and steep slopes; and to delineate the boundaries of watersheds and drainage areas. The patterns of development often conform to topographic features, especially in suburban and rural areas. In the previous section, Existing Land Use, significant differences were noted in development patterns between Pequannock and the rest of Morris County. One reason for these differences is the regional topography, which physically isolates the Township from most of Morris County by mountainous terrain, while connecting it to Passaic and Essex County by rivers and floodplains.

As described in the section on Geology, Pequannock Township sits at the juncture of two geologic provinces in New Jersey: the flat/rolling Piedmont and the steep/rocky Highlands. Although the largest portion of Pequannock Township lies in the Piedmont and is very flat, having elevations that vary between 180 and 200 feet above mean sea level, in the northwestern corner that marks the beginning of the Highlands, a dramatic change in elevation occurs. In this area, which begins in the vicinity of the western portion of Mountain Avenue and the eastern edge of Mountainside Park, and is crossed by Route 287, elevations begin at about 200 feet and climb as high as 734 feet at the top of Pequannock's Turkey Mountain, aka Pequannock Knob (see Figure 6-2 and 6-3). Figure 6-1 shows the dramatic visual change in topography.

Between the western portion of Mountain Avenue and the Township's northwestern borders, much of the terrain contains slopes in excess of 20 percent. These areas are very susceptible to soil erosion with any disturbance of the ground or vegetative cover and should be considered as areas of special ecological concern. The steep slopes also contribute a significant amount of water for municipal wells. Runoff from the slopes to the lower elevations, traveling

either above ground or through the soils has the potential of recharging the aquifers below. Figure 6-4 illustrates Pequannock's topographic characteristics in relation to degree of slope.

The abrupt change in elevation provides excellent views of Pequannock Valley from Mountainside Park. One can also view the mountains from several locations within the Township. Examples are at Jacksonville Road (see Figure 6.1), Chilton Hospital, and Route 23, when traveling north. Some of the pristine quality of these mountain views was lost,



Figure 6-1: Vista from Jacksonville Road shows the dramatic change in Pequannock from the Piedmont region (foreground) to Highlands region (background).

particularly from the Route 23 perspective, with the cut in the mountain required for the construction of Route 287.

This situation has raised the issue of maintaining views of undisturbed or unimproved mountains, a goal specifically listed in the Township Master Plan. At present Pequannock Township does not have an ordinance protecting steeply sloped land from disturbance.

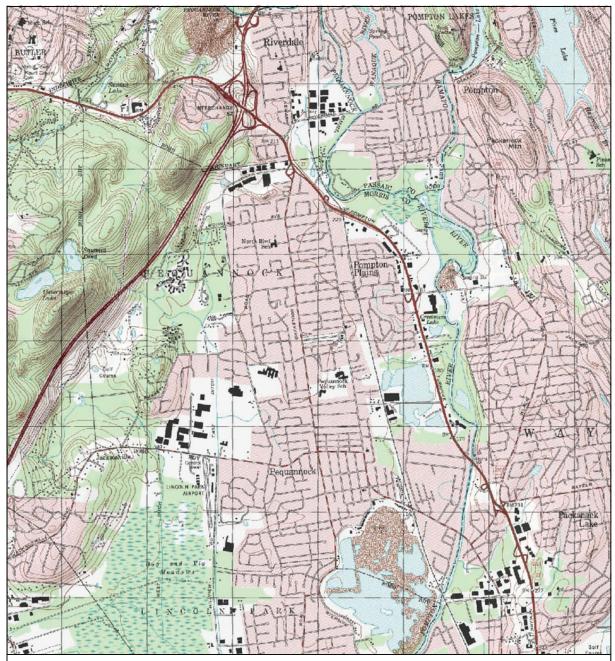
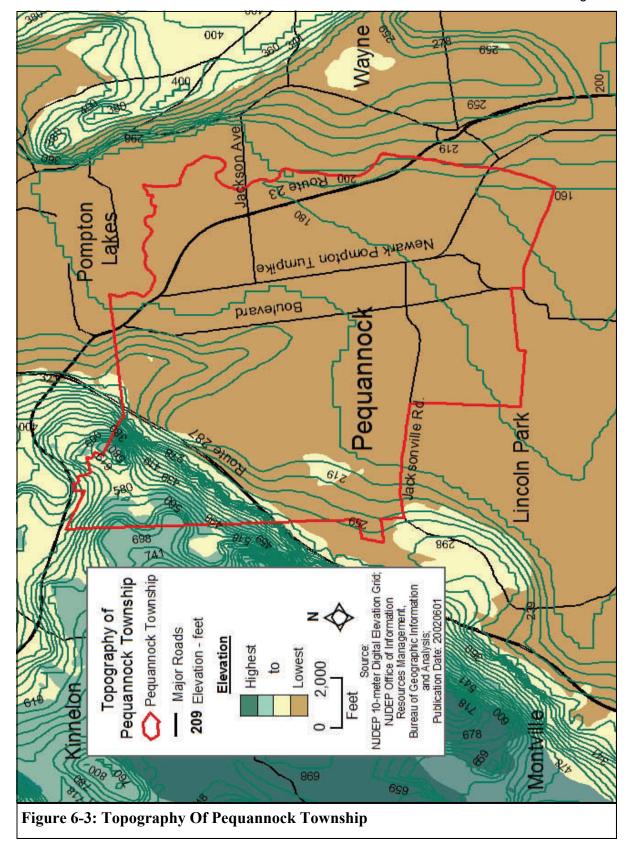
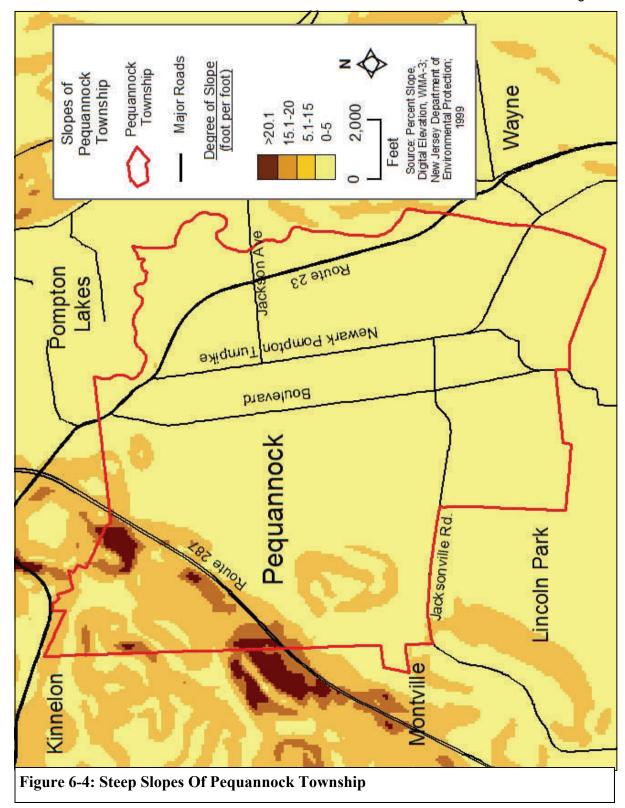


Figure 6-2: Topographic Map Of Pequannock Township And Surrounding Area





# 7. Geology

Geology, the study of the composition, structure, and history of the earth, can be considered the "bedrock" of any environmental analysis or inventory. The types of soils and minerals, the presence and movement of groundwater and the kinds of vegetation all are direct results of geologic processes. The processes of geology are constantly at work reshaping the landscape. Some are readily observable, such as erosion and sedimentation. Others such as faulting, volcanic activity, folding, bending, and compression, can only be observed in the geologic time frame of millions of years, and can be considered dormant since the last retreat of the glaciers. A complete understanding of the geologic history of a region can take years of study. The following information, from the introduction to John E. B. Baker's Geologic History of Pequannock Township, only scratches the surface, but will adequately serve the purpose for this report.

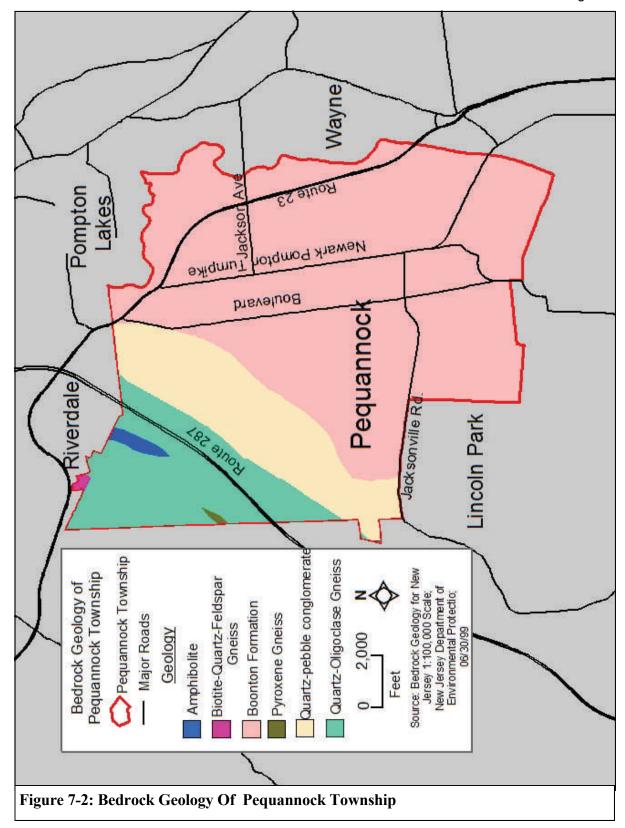
Pequannock Township straddles two of the four major geographic and geologic provinces in New Jersey: the Mesozoic Piedmont and the Precambrian Highlands. The

former is a suite of sediments and volcanic rocks, approximately two hundred million years old, collectively referred to as the Brunswick formation, and the latter is crystalline plutonic and metamorphic rocks about one billion years old, known as the Precambrian formation. Only 18,000 years ago, both of these provinces were covered by the last glacial advance. Figure 7-1 illustrates the location of Pequannock in relation to these physiographic provinces, and Figure 7-2 shows the underlying geology of the township.

In Pequannock, the border separating the Highlands and Piedmont Provinces is the Ramapo Fault. The oldest rocks are Precambrian gneisses and plutonic zones that resulted from the metamorphism and melting, in place, of even older marine volcanics and sediments on the border of the ancient continental shield or craton of North America. These oceanic rocks were subducted to a depth of some 18 km., 600 to 700 degrees Celsius, and pressures of 5 kilobars (75,000 pounds per square inch). At this



Figure 7-1: Physiographic Provinces Of New Jersey



depth, about 1.1 to 1.3 billion years ago, the oceanic sediments and volcanics were metamorphosed and locally melted to create the gneisses, marbles, pink granites and amphibolites we see today. They have been uplifted by plate tectonics and thrust faulting to where we see them in outcrops along Routes 23 and 287. This geologic upheaval formed the New Jersey Highlands Province, which is known as a source for the magnetite iron ores so vital during the Revolution and also as an apparent source of radon gas. These features are depicted in Figure 7-5 and Figure 7-6.

Starting about one million years ago, glaciers began their advance from the polar ice caps. There were a number of advances and retreats, lasting thousand or tens of thousands of years.

The last glacial advance, the Wisconsin, ended only 20,000 years ago, a mere heartbeat in the history of the Earth.

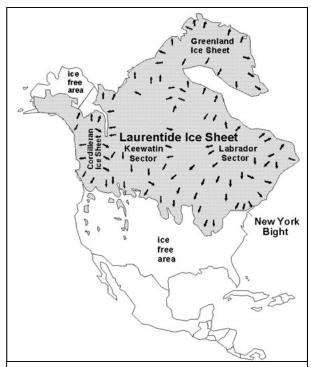


Figure 7-3: Extent Of Late Pleistocene Glaciation In North America. (Source: USGS; Quaternary Geology of the New York City Region)

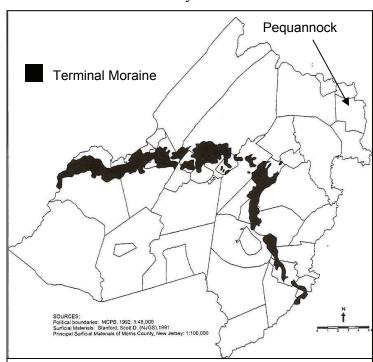


Figure 7-4: Location Of Terminal Moraine In Morris County (Source: A Natural Resource Management Guide for the County of Morris 2000)

This final ice sheet covered large areas of North America (see Figure 7-3) and the northern third of New Jersey, leaving a large pile of debris known as the terminal moraine (see Figure 7-4). The terminal moraine, up to two hundred feet high and at least a mile wide, is that pile of material "bulldozed" by the end of the glacier's toe, whose edge in New Jersey runs through Dover and Morristown, dips southeast towards Perth Amboy, and then winds northeast into the ocean to form Long Island, New York.

Because the terminal moraine created a natural dam across the valley between the Watchung lava flows and the Ramapo fault-line, the melting glacial ice formed many lakes. One of these lakes,

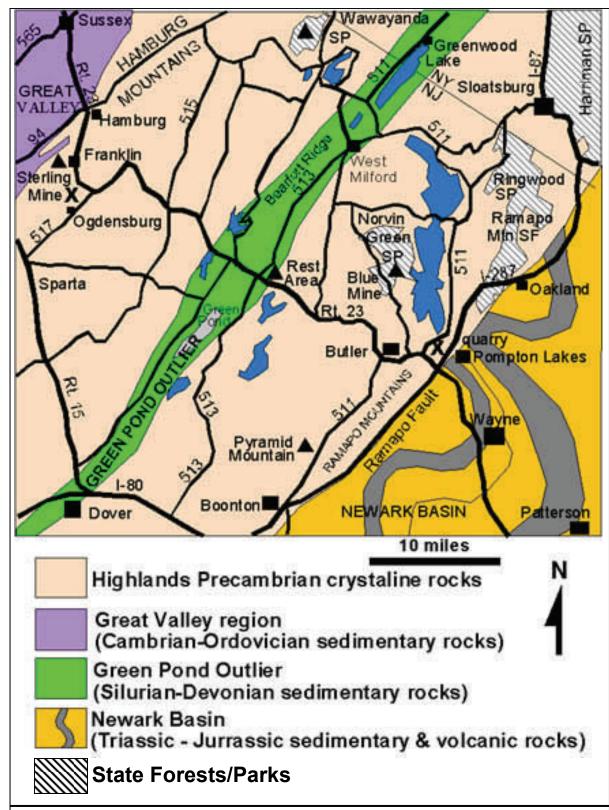
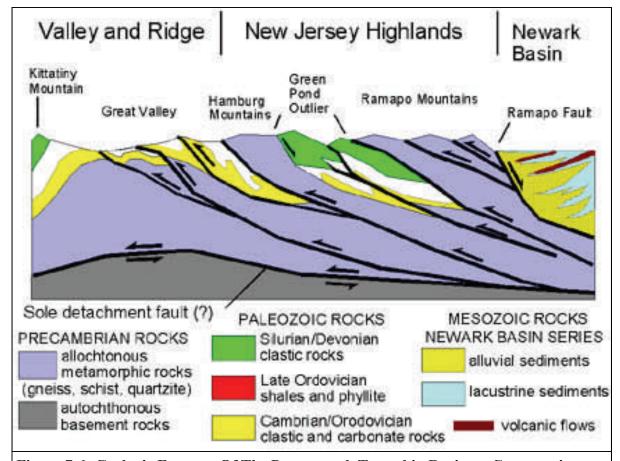


Figure 7-5: Geologic Features Of The Pequannock Township Region

Source: US Geological Survey, Highlands Sites in New Jersey, <a href="http://3dparks.wr.usgs.gov/nyc/highlands/ramapo.htm">http://3dparks.wr.usgs.gov/nyc/highlands/ramapo.htm</a>, 2003



**Figure 7-6: Geologic Features Of The Pequannock Township Region—Cross section** Source: US Geological Survey, Highlands Sites in New Jersey, <a href="http://3dparks.wr.usgs.gov/nyc/highlands/ramapo.htm">http://3dparks.wr.usgs.gov/nyc/highlands/ramapo.htm</a>, 2003

called Glacial Lake Passaic, covered between 10 and 30 miles, to a depth of 250 feet, occupied the area between the Jurassic Watchung Lavas and the Ramapo Fault.

Glacial Lake Passaic existed in various forms, from about fourteen to six thousand years ago. Where streams entered the lake, they deposited large deltas. One forms the high ridge of sand and gravel separating Riverdale and Houdaille sand pits (Mountainside Park). Where the Passaic River bogs down, to pass over the flat glacial drift south of the Hook Mountain lava flows in Lincoln Park, it begins to meander. Here it has created features such as a wide flood plain (the meadows), bayou streams, cut off ox-bow lakes and other features of a mature river. During this time, fine-textured sediments were deposited on the lake bottom. These fine muds formed an impermeable cap which confines Pequannock's subterranean aquifer, the source of most of the township's drinking water. Figure 7-7 illustrates three stages of Glacial Lake Passaic in relation to the Pequannock area.

The passage of glaciers over Pequannock, had other impacts, such as erosional forces, that transformed the landscape. This passage rounded off the tops of the Highlands ridges

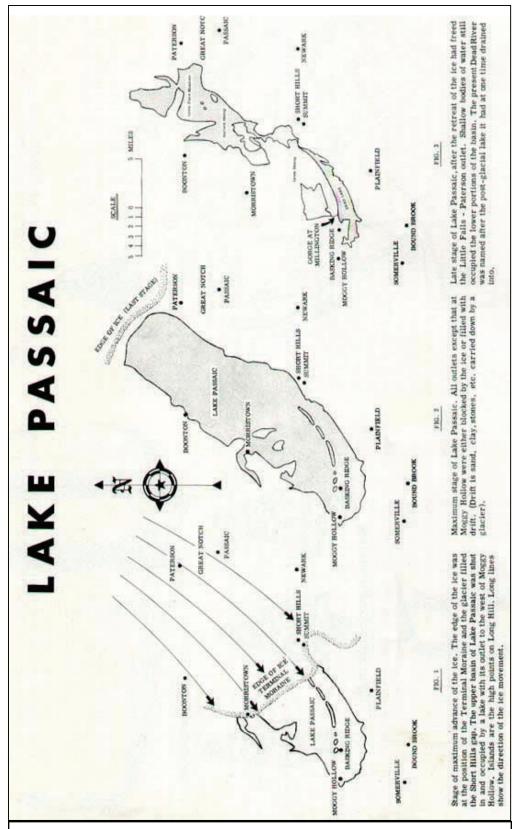


Figure 7-7: Glacial Lake Passaic

(Source: Wikipedia.com. << http://en.wikipedia.org/wiki/Glacial\_Lake\_Passaic, 2008)

and turned the former V-shaped river valleys between the ridges into U-shaped valleys. This was accomplished by the ground moraine, made of plucked up boulders, cobbles, pebbles, sand and silt that gouged, polished, grooved and striated the bedrock surface. Nowhere is

Figure 7-8: U-shaped Valley Of Pequannock River

this better demonstrated than on the outcrop of cataclastic (fault created) mylonite/phyllonite near the parking lot at Mountainside Park. Another good local example, shown in Figure 7-8, is the glacially-formed U-shaped notch where the Pequannock River in West Milford passes between Kanouse Mountain and Copperas Mountain.

The glaciers deposited two kinds of "drift": unsorted, unstriated "till," and striated,

better sorted melt water deposits called "fluvoglacial" sediment. The former deposits form

moraines, dumped in place as the ice receded, whereas the latter were carried and sorted by the meltwater streams. In Pequannock, pockets of till can still be found, with giant boulders on top of the peaks of the Highlands (see Figure 7-9). The valley, however, is mostly filled with fluvoglacial deposits dropped by torrential meltwater streams and moraine-dammed Glacial Lake Passaic sediments. As the ice thinned, holes or wells formed and the streams traversing the surface of the glacier deposited striated and



Figure 7-9: Boulder Deposited By Glacier, Mountainside Park

sorted, cone-shaped mounds of sands and gravels called "kames." These kames are found throughout northern New Jersey above the terminal moraine. They are often quarried for sand and gravel for the cement industry.

Today's major geologic activity in the area is an occasional earthquake along the Ramapo Fault. These tiny tremblers are probably caused by the uplift of the rocks

readjusting themselves after the loss of the weight of the great ice sheet. The Ramapo Fault has been the focal point of major tectonic activity for over a billion years. One of the best places to view the scars of this activity is the small, glacially scoured, polished, gouged, and striated outcrop of cataclastic phyllonite and mylonite at Mountainside Park. This rock shows several periods of faulting. The original rocks show intense deformation from compression under extreme pressure but little heat. These can be seen in the highly contorted, multiple folds and kinks in the outcrop. These folds upon folds are further cut by younger tiny faults now filled with secondary minerals like quartz and, in Riverdale, by greenish epidote and chlorite. These folds and faults are cut by still younger unfilled joints and faults.

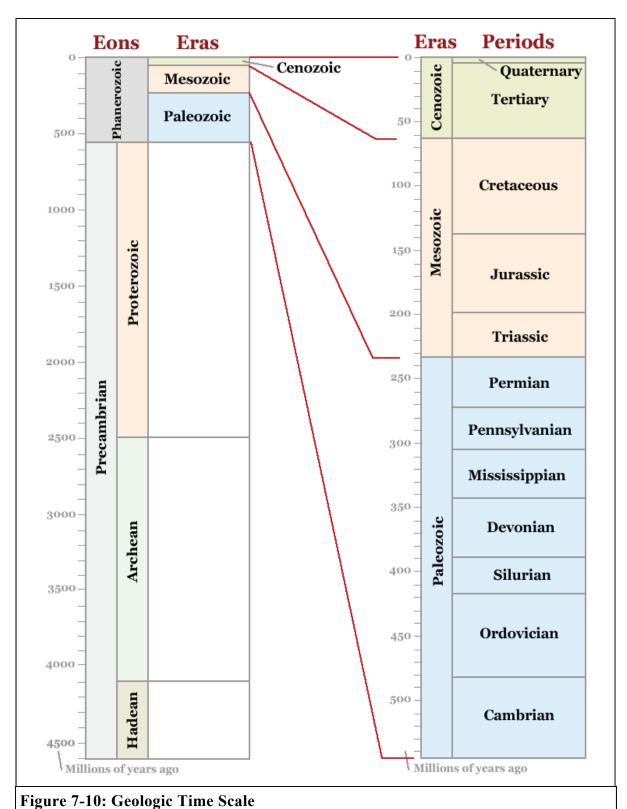
Geologists surmise that the Ramapo fault was active during the Grenville Orogeny (compressional-thrust faulting) in the late Proterozoic Eon (see Figure 7-10), one billion years ago; during the Taconic Orogeny (thrust, normal and horizontal faulting) in the Cambrian Period of the Paleozoic Era, four hundred million years ago; later in the Paleozoic Era, during Allegheny Orogeny, 300-350 million years ago (thrust faulting); and during the Jurassic Period of the Mesozoic Era, 150 to 200 million years ago (rifting - normal and block faulting). Each was associated with some type of magmatic intrusions or anatectic, in-place melting, and each occurred at various depths; from 20 km. to the surface .

Along the fault line, where Routes 287 and 23 cross, another fault associated phenomenon can be seen. This is slickensides, the polished surface where one block of rock passes by another. These are observed in outcrops throughout the road cuts.

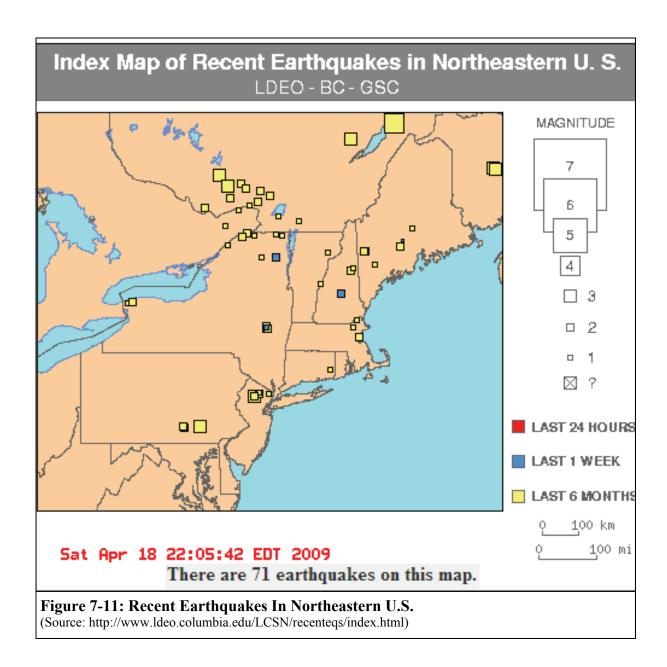
Today, with modern seismic techniques, it is possible to calculate the focus (at some depth, usually 1 to 2 km.) and epicenter (point on surface above focus) for each quake in an area. One should note that the Ramapo fault is really a series of smaller, parallel faults running in a southwest-northeast strike, and separating the Piedmont Province from the Highlands Province. Standing in Pequannock Valley and looking to the northwest at the Highlands, one can see the normal fault scarp dipping some 50 degrees to the southeast.

Every year several small earthquakes are recorded along the Ramapo fault-line, or one of its subsidiaries. Most cannot be felt by humans and only register as a one or two on the Richter scale at local seismic stations. Every couple of years there is a three or a four on the Richter scale, which is felt as a deep rumbling and a rattling of windows. Some scientists feel that the region is due for a major quake. For example, between February 2 and February 18, 2009, a series of five quakes with magnitudes from 1.1 to 3.0 occurred within approximately 20 miles of Pequannock (see Figure 7-11).

Although New Jersey's building code reflects a low probability of the occurrence of a major earthquake, some scientists feel that the region is due for a major quake. Professor Alexander Gates, chair of the Rutgers University, Newark, Department of Earth and Environmental Sciences and author of "The Encyclopedia of Earthquakes and Volcanoes", spoke about the Ramapo Fault in an interview with the New York Times (Margo Nash, March 25, 2001, ON THE MAP; Exploring the Fault Where the Next Big One May Be Waiting). Gates said "We should not forget that we had a 5.4 earthquake 117 years ago. The recurrence interval for an earthquake of that magnitude is every 50 years, and we are overdue." Recent quake information can be found at <a href="http://www.ldeo.columbia.edu/LCSN/recentegs/Quakes/quakes0.html">http://www.ldeo.columbia.edu/LCSN/recentegs/Quakes/quakes0.html</a>.



(Source: http://geology.com/time.htm)



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#### 8. Soils

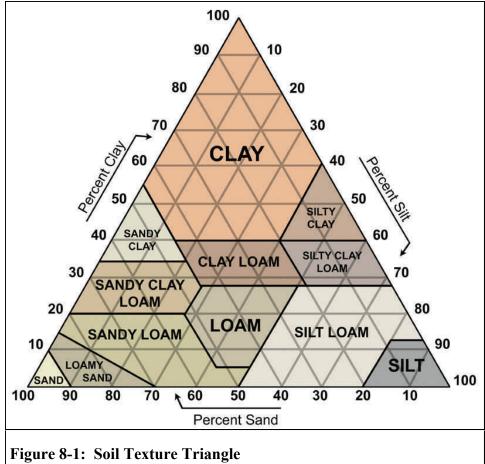
Soil properties are often used in planning the nature and location of developed land uses. Application of soil analyses helps minimize the long term cost and environmental impact of construction on a particular site, as well as the impact of planning on a larger, more generalized scale. The following brief explanation of the structure and properties of soil in general demonstrates the importance of soil in the context of this ERI.

The main constituents of a typical soil are rock particles produced by the weathering process from the parent material of the soil. The parent material may be either local bedrock or material brought to its present location by glaciation, water, wind or other forces. The particles become mixed with decaying animal and vegetable matter that has fallen to the ground. The spaces between this combination of organic and inorganic particles are filled with air or with water which filters down into them. The relative amount of water and air in a soil varies with time, depending on local precipitation. When the particles of a soil are of a common size, the soil is called "sorted." When particles of different sizes are mixed together, the soil is "unsorted." The pore spaces, or voids, in sorted soils are uniform in size and allow water to flow through them easily. In unsorted soil, the voids are smaller and more varied in shape, making it more difficult for water to pass through them. The drainage rate of unsorted soils is slower than that of sorted soils.

Soils are classified according to their textures, which are dependent on particle size. Sand particles are the largest, silt smaller, and clay the finest. Soil scientists can determine soil texture in the field by feeling it, or more precisely in the laboratory by using sieves. Figure 8-1 gives the names of the soil classes and the percentages of different particle sizes in each class.

A special relationship exists between water and soil when the percentage of clay particles is high. Because the clay particles are very fine, the water cannot readily drain through the pore spaces. The chemical composition of clay also allows the water to bond to the individual particles. The effectiveness of the bonding is increased by the unusually high surface -to-volume ratio of the clay particles. As a result, clay expands when wet. As it dries, it shrinks and cracks. Its poor drainage characteristics, plus its wet-dry instability, cause clay to present special limitations for both agriculture and development. Limitations for land uses are also presented by other soil properties such as stoniness, insufficient depth of soil, high potential for erosion or a generally high water table.

Water which infiltrates into soil sorts the soil materials by carrying the finer particles into deeper pore spaces and leaving the coarser particles in place. The simultaneous processes of accumulation of material and differentiation of that material into layers called "soil horizons" takes place over a long period of time. The farmer is primarily interested in the properties of the upper horizon, while the engineer is concerned with deeper layers that remain after the topsoil has been removed from a construction site. Some water, as it moves down through the voids in soil, is absorbed by the roots of trees and plants. The rest eventually reaches the water table, below which all of the voids are filled. The depth of the water table below the surface of the ground varies with time, depending on long-term precipitation levels. In general, however, the water table reaches a high point in the late spring. The long-term average level of this high point is called the "seasonal high water table." It can be



(Source: http://www.soilsensor.com/soiltypes.aspx)

determined at any specific location by color changes in the soil. Long-term presence of water gives the soil a grayish color, whereas soil that has fairly steady exposure to air is a brownish or reddish color due to oxidation of iron in the soil particles. The gray discoloration is also present in soils which are flooded regularly.

In the USDA/SCS Soil Survey for Morris County, the soils in Pequannock are classified into three soils associations, depending on how they were formed. One of these associations contains soils formed in young glacial till. These soils are dominantly gravelly and extremely stony sandy loams underlain by glacial till that ranges from gravelly loam to silt loam. Outcrops of bedrock are common in some steep areas. In Pequannock, this soil association is the Rockaway-Hibernia-Urban land association, described as deep, welldrained to somewhat poorly drained, gently sloping to steep gravelly sandy loams and stony to extremely stony loams and sandy loams that overlie granite gneiss; on uplands.

Another soil association is the Riverhead-Urban land-Pompton association, formed in organic deposits, glacial lake sediment, or glacial outwash. These soils consist of wet organic soils, wet clayey soils, and wet or dry gravelly sandy loams. They are underlain by stratified or lacustrine sediment and are in basins, on low plains, or on terraces. This association consists of deep, well-drained to somewhat poorly drained, nearly level to

strongly sloping gravelly sandy loams and sandy loams that overlie stratified outwash sand and gravel: on outwash plains and terraces.

The third soil association found in Pequannock is the Carlisle-Parsippany-Preakness association, also formed in glacial lake sediment or outwash. Soils in this association are deep, poorly drained and very poorly drained, nearly level mucks, silt loams, and sandy loams that overlie stratified lacustrine sand, silt, and clay or stratified outwash sand and gravel: in depressions or along low-gradient streams.

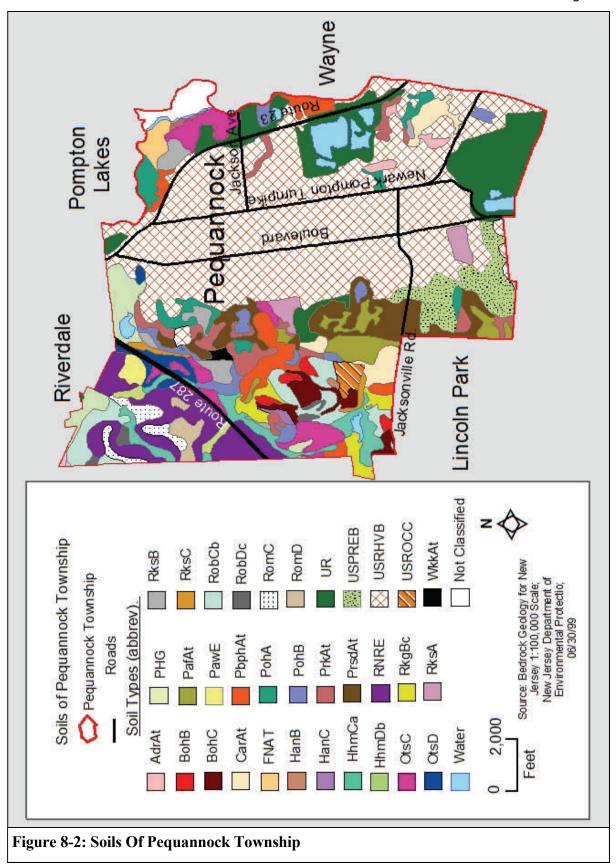
The soils of Pequannock Township are described and illustrated in Figures 8-2 to 8.6. These soil series are fully described in Appendix C with information taken from the U.S. Department of Agriculture, National Resources Conservation Service. Table 8-1 shows the relationship between the soil symbols in these Figures and the soil names listed in Appendix C.

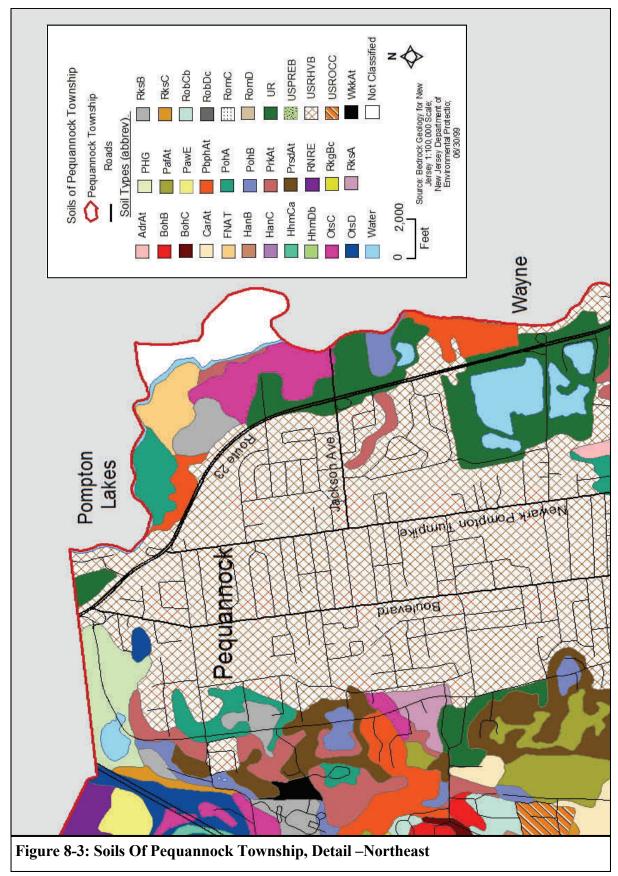
Table 8-1: Relationship Of Map Symbols To Soil Names And Descriptions				
Map Symbol	p Symbol Description			
AdrAt	At Adrian muck			
BohB	Boonton Moderately well drained gravely loam, 3-8 percent slopes	Boonton		
BohC	Boonton Moderately well drained gravely loam, 8-15 percent slopes	Boonton		
CarAt	Carlisle muck, 0-2 percent slopes, frequently flooded	Carlisle		
FNAT	Fluvaquents and udifluvents, 0-3 percent slopes, frequently flooded	Fluvaquents		
HanB	Haledon silt loam, 3-8 percent slopes	Haledon		
HanC	Haledon silt loam, 8-15 percent slopes	Haledon		
HhmCa	Hibernia loam, 3-15 percent slopes, stony	Hibernia		
HhmDb	Hibernia loam, 15-25 percent slopes, very stony	Hibernia		
OtsC	Otisville gravelly loamy sand, 3-15 percent slopes	Otisville		
OtsD	Otisville gravelly loamy sand, 15-25 percent slopes	Otisville		
PHG	Pits, sand and gravel	Pits, sand and gravel		
PafAt	Palms muck, 0-2 percent slopes, frequently flooded	Palms		

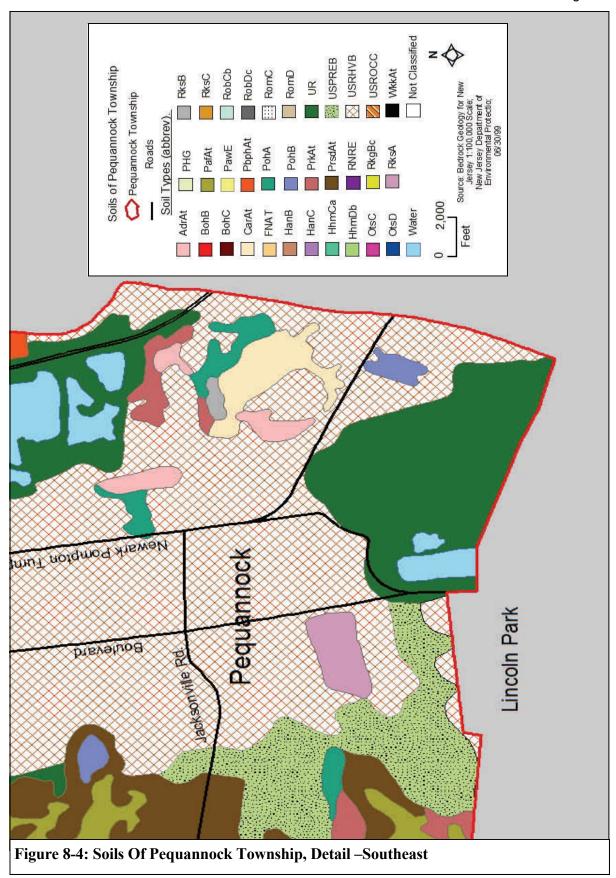
The soils associated with wetland conditions are known as hydric soils. In Pequannock, Pequannock Township Environmental Resource Inventory 07/20/09

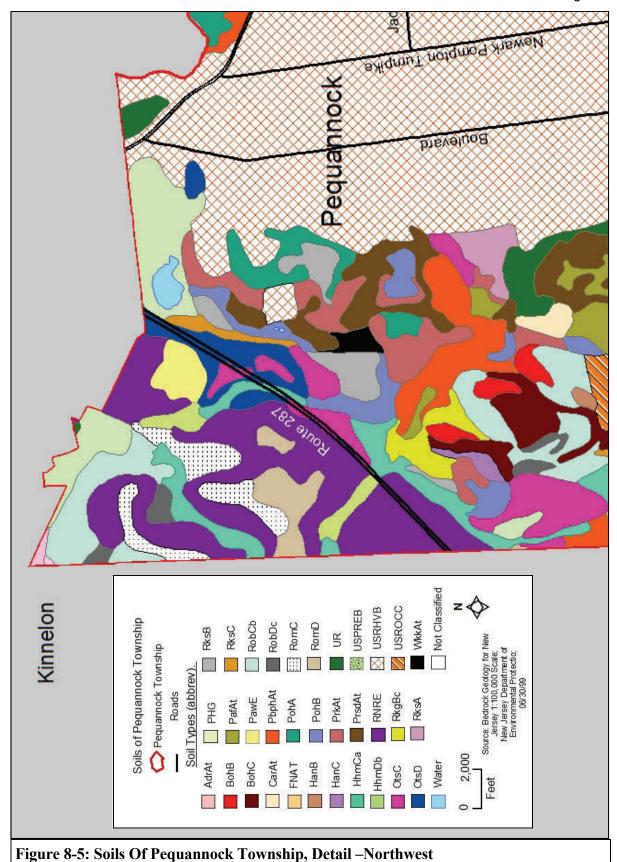
Table 8-1 (continued): Relationship Of Map Symbols To Soil Names And Descriptions

Map Symbol	Description	Name/Series	
PawE	Parker-Rock outcrop complex, 25-45 percent slopes	Parker	
PbphAt	Parsippany silt loam, sandy loam substratum, 0-3 percent slopes	Parsippany	
PohA	Pompton sandy loam, 0-3 percent slopes	Pompton	
PohB	Pompton sandy loam, 3-8 percent slopes)	Pompton	
PrkAt	Preakness sandy loam, 0-3 percent slopes, frequently flooded	Preakness	
PrsdAt	Preakness dark surface variant sandy loam, 0-3 percent slopes, frequently flooded	Preakness	
RNRE	Rock outcrop—Rockaway complex, 15-35 percent slopes	Rockaway	
RobCb	Rockaway sandy loam, 8-15 percent slopes, very stony	Rockaway	
RobDc	Rockaway sandy loam, 15-25 percent slopes, extremely stony	Rockaway	
RomC	Rockaway –Rock outcrop complex, 8-15 percent slopes	Rockaway	
RomD	Rockaway –Rock outcrop complex, 15-25 percent slopes	Rockaway	
RkgBc	Ridgebury loam, 0-8 percent slopes, extremely stony	Ridgebury	
RksA	Riverhead gravelly sandy loam, 0-3 percent slopes	Riverhead	
RksB	Riverhead gravelly sandy loam, 3-8 percent slopes	Riverhead	
RksC	Riverhead gravelly sandy loam, 8-15 percent slopes	Riverhead	
UR	Urban Land	Urban Land	
USPREB	Urban land-Preakness complex, 0-8 percent slopes	Urban Land	
USRHVB	Urban land—Riverhead complex, 3-8 percent slopes	Urban Land	
USROC	Urban land-Rockaway complex, 3-15 percent slopes	Urban Land	
WkkAt	Willette muck, 0-2 percent slopes, frequently flooded	Willette	

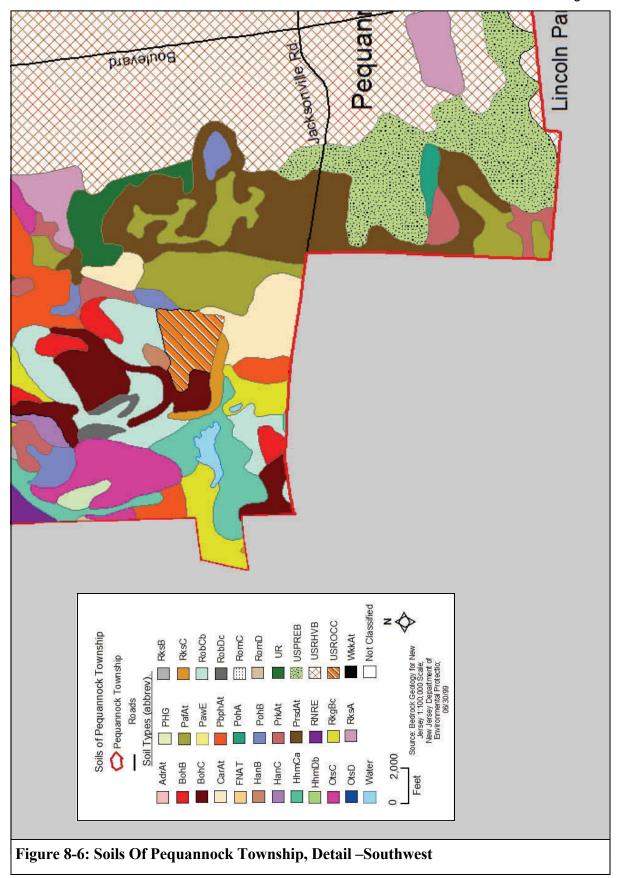








Pequannock Township Environmental Resource Inventory



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### 9. Climate

For most local planning decisions, average annual precipitation is a primary climatological factor of interest, because the amounts of runoff from rainfall and snowmelt influences water supply, flood control, and groundwater recharge. Average temperature and wind direction are also important considerations in design and construction. Although actual weather conditions vary from year to year, a compilation of statistical information over a period of years can give a good idea of average weather conditions, which can be used to generate a profile of a regional climate.

Since 1854, there has been a continuous record of weather data taken in Newark, and there are now about seventy five "first order" stations for recording weather data throughout the state. These stations record temperature, humidity, wind speed and direction, and barometric pressure on an hourly basis. Other "second order" stations record less data less frequently. The information collected from these stations and also from private "cooperative observing" stations is collected by the National Weather Service Center in Asheville, North Carolina. The New Jersey State Climatologist publishes some of this information in monthly and annual summaries.

Pequannock's climate, although temperate and humid, has a continental climate with very little oceanic influence. The nearest weather recording station to Pequannock is located in Boonton. Table 9-1, taken from the New Jersey State Climatologist website, contains some of the precipitation and temperature data collected at this station. This table reveals that although the annual average precipitation in Boonton is 50.94 inches, and is well distributed throughout the year, the heaviest accumulations of rain occur during the summer months. Most of the summer rain falls during the thirty three thunderstorms that occur as a yearly average. In Boonton, a wet year could have as much as 59.4 inches of rainfall and a dry year could be as low as 35.1 inches.

Although summer temperatures seldom exceed 100 degrees Fahrenheit, readings in the nineties are not uncommon during July and August. Winter temperatures are generally above 10 degrees Fahrenheit most of the time, but can remain sufficiently cold for durations long enough to require footings and farm drainage tiles to be excavated to a depth greater than 30 inches to protect them from freezing.

The typical length of the growing season in the Pequannock area is 130 to 170 days with an average of 151 days. The usual date of the first killing frost varies from September 19 to October 18 with an average date of October 3. The last killing frost normally ranges from April 22 to May 18 with an average date of May 5.

 $\begin{tabular}{ll} \textbf{Table 9-1: Climate Information Collected In Boonton From 1971-2000} \\ \textbf{Source: NJ State Climatologist; http://climate.rutgers.edu/stateclim_v1/norms/monthly/index.html} \\ \end{tabular}$ 

Month	Average Low Temperature	Average High Temperature	Average Temperature	Average Monthly Precipitation
January	18.7	36.1	27.4	4.17
February	20.4	39.2	29.8	3.05
March	29.2	48.6	38.9	4.24
April	39.1	60.0	49.6	4.37
May	48.8	71.1	60.0	4.83
June	57.8	79.5	68.7	4.55
July	62.7	84.5	73.6	4.67
August	60.9	82.7	71.8	4.05
September	52.7	75.2	64	5.08
October	40.6	63.6	52.1	3.96
November	33.5	52.3	42.9	4.19
December	24,6	41.0	32.8	3.78

## 10. Hydrology and Water Quality

All plants and animals need water to sustain life. Water enables the body to absorb nutrients and eliminate wastes. Many animal and plant species live their entire lives within an aquatic environment. Interestingly, water covers about two-thirds of the earth's surface and comprises about two-thirds of human body weight. Water, in its natural condition, is never completely "pure". The chemical and physical properties of water can differ from place to place at the same time and from time to time in the same place. These differences can be naturally occurring or man-made. Generally speaking, the quality of life on earth depends in a large measure on the quality and quantity of available water.

Water is a clear, colorless, tasteless, and nearly odorless substance which can occur in gaseous, liquid, or solid form within the normal range of temperature. More than half of the identified chemical elements can be dissolved in water, and many of these are ingested by plants and animals in this manner. Since there is practically no chemical interaction with most of the dissolved substances, the basic properties of water remain. This property allows water to be cleansed of almost any other material. Water becomes polluted when this cleansing capacity is exceeded.

The source of all water on our planet is precipitation. In general, precipitation which falls to earth evaporates or transpirates into the atmosphere, infiltrates into the ground, or becomes surface runoff. The hydrologic cycle shown in Figure 10-1 illustrates this

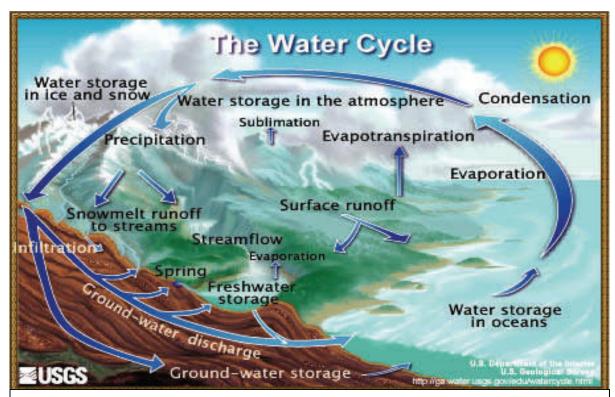


Figure 10-1: The Water Cycle

(Source: U.S. Geological Survey. 2006. *The Water Cycle*. U.S. Geological Survey. <a href="http://ga.water.usgs.gov/edu/watercyclesummary.html">http://ga.water.usgs.gov/edu/watercyclesummary.html</a>)

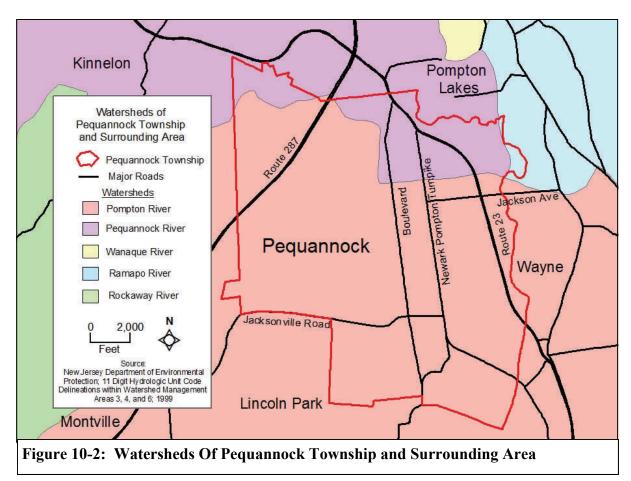
phenomenon.

### 10-I. Surface Water Hydrology

Watersheds are topographically defined drainage areas that contain all the sources of water that contribute to a specific body of water. Pequannock Township sits at or near the junction of several watersheds as shown in Figure 10-2, including portions of the watersheds of the Pompton River, Ramapo River, Pequannock River, and Wanaque River. The principal waterways of Pequannock Township are illustrated in Figure 10-3.

As illustrated in these figures, the Wanaque River joins the Pequannock River in Pompton Lakes, and then the Ramapo River joins the Pequannock River to form the Pompton River. To get a sense of the relative importance of each of these tributary drainage basins on the Pompton River, it is useful to note that the water at the head of the Pompton River is comprised of about 58 percent Ramapo River, 30 percent Pequannock River, and 12 percent Wanaque River (based on the median flows measured in each river by the US Geological Survey.)

There are many factors which determine the flow of water through a watershed. These factors, which include the amount and frequency of rainfall, geographic features of the land including slope, shape, and size, and the kinds of soil, enable hydrologists to estimate the amount of water that is produced in a watershed. For planners, these estimates are



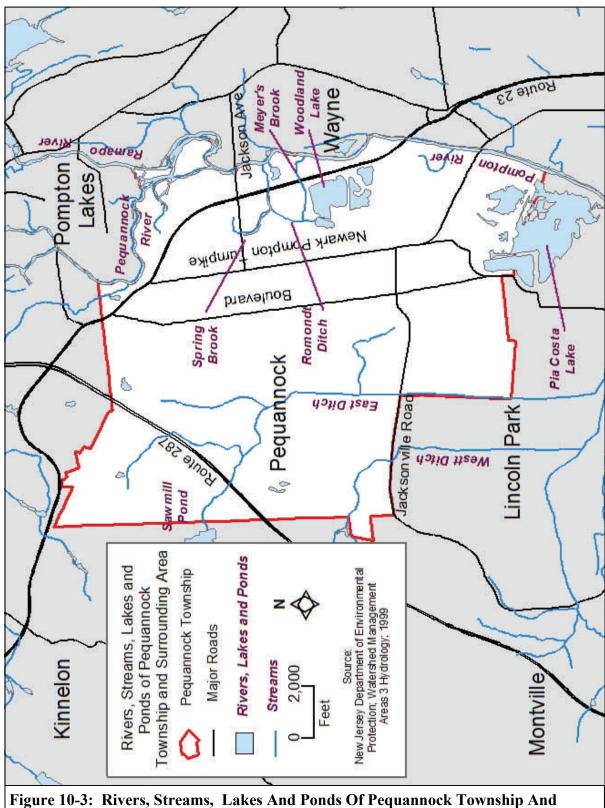


Figure 10-3: Rivers, Streams, Lakes And Ponds Of Pequannock Township And Surrounding Area

invaluable for water supply and wastewater management, irrigation, recreation, navigation and flood control.

Both droughts and floods are natural phenomenon, although they can be exacerbated by manmade changes to land use. For example, the increase of impervious cover—roads, buildings, and parking lots—can reduce groundwater recharge, leading to low stream and river flows during non-rainfall periods. During rainfalls this impervious cover channels more water to rivers and streams, increasing the likelihood of flooding.

Low lying areas of Pequannock are subject to periodic flooding caused by the overflow of the Pompton, Pequannock, and Ramapo Rivers, the East and West Ditches, and tributaries to the East Ditch. The greatest flood on record occurred in 1903, and the second greatest in on March 2, 1902, as a result of snowmelt and heavy rain.

Since 1940, the USGS has continuously recorded water levels at a gauge on the Pompton River in Pompton Plains. Table 10-1 shows the top-ten flood elevations recorded at this gauge. As shown, all of the top-ten floods have occurred since 1968. These major floods typically occur in either the spring (February to May) or fall (September through November). The flood of 1984 caused substantial damage (roughly \$600 million) and the governor declared a disaster area. The storms of May 1968 and April 2007 also caused widespread damage. Figures 10-4 to 10-7 show the peak discharges recorded on the Pompton River at Pompton Plains from 1940 to 2008.

Table 10-1: Top- Pompton Plains	Ten Flood Elevations C 1940-2009	Of Pompton River At
Rank	Date	Elevation (ft)
1	04/06/1984	24.47
2	05/30/1968	22.18
3	04/16/2007	21.72
4	09/17/1999	21.00
5	04/03/2005	20.42
6	02/03/1973	20.37
7	04/10/1980	19.56
8	11/09/1977	18.65
9	11/09/2005	17.86
10	10/13/2005	17.56

Notes:

Elevations are with respect to gauge datum. Flood stage is at 16 ft. Lowest level of 0.0 ft was recorded on 8/18/1904 and 4/1/2002.

 $Source: \underline{http://newweb.erh.noaa.gov/ahps2/crests.php?}$ 

wfo=phi&gage=pppn4

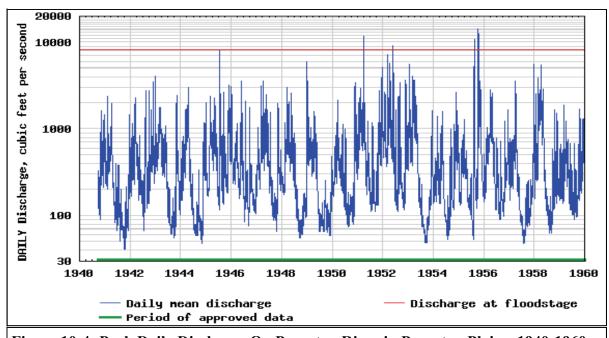


Figure 10-4: Peak Daily Discharge On Pompton River in Pompton Plains, 1940-1960 (Source: http://waterdata.usgs.gov/nj/nwis/dvstat/?format=sites\_selection\_links&search\_site\_no=01388500)

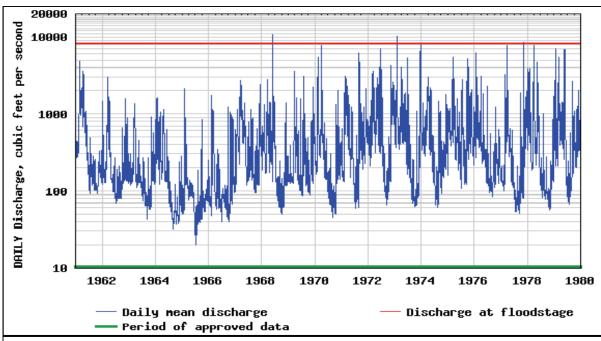


Figure 10-5: Peak Daily Discharge On Pompton River in Pompton Plains, 1961-1980 (Source: http://waterdata.usgs.gov/nj/nwis/dvstat/?format=sites\_selection\_links&search\_site\_no=01388500)

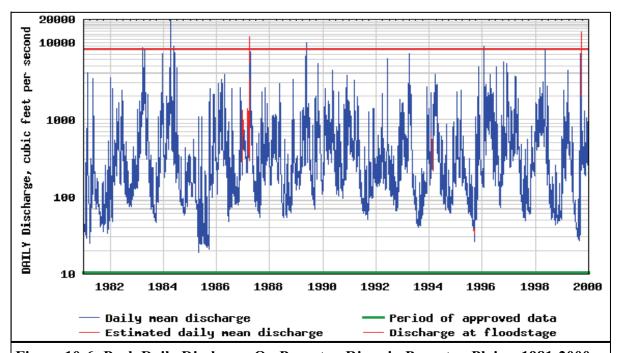


Figure 10-6: Peak Daily Discharge On Pompton River in Pompton Plains, 1981-2000 (Source: http://waterdata.usgs.gov/nj/nwis/dvstat/?format=sites\_selection\_links&search\_site\_no=01388500)

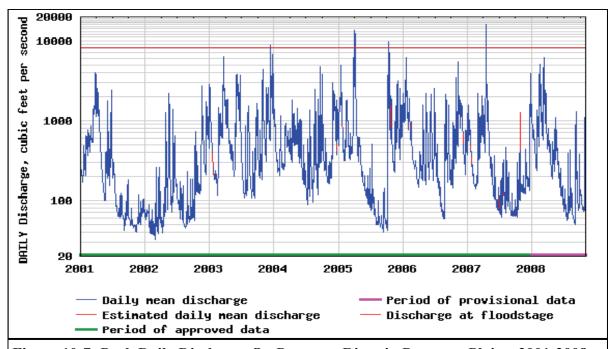
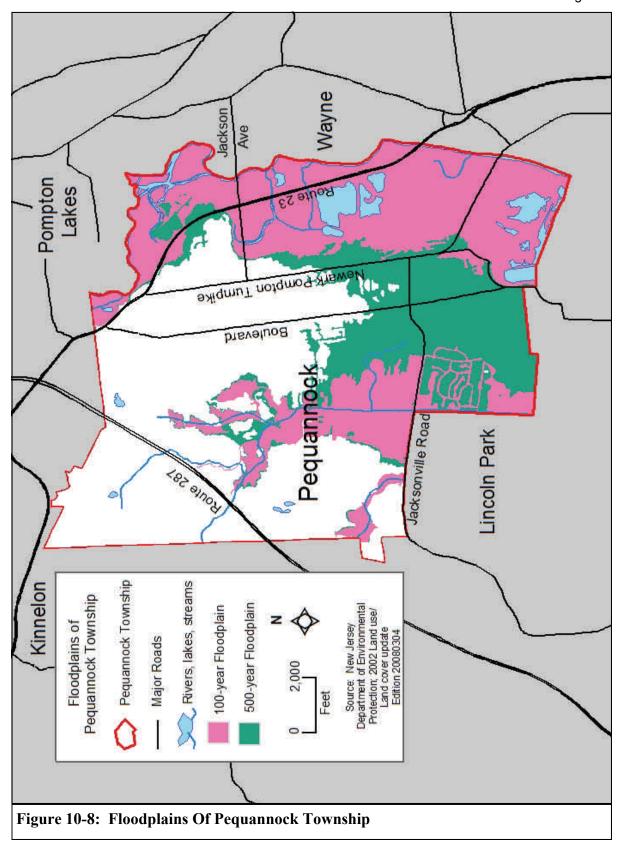


Figure 10-7: Peak Daily Discharge On Pompton River in Pompton Plains, 2001-2008 (Source: http://waterdata.usgs.gov/nj/nwis/dvstat/?format=sites\_selection\_links&search\_site\_no=01388500)



#### 10-II. Streamflow Characteristics

Streamflow patterns are of interest in water quality planning when determining the assimilative capacities of a stream. The greatest factor controlling the overall waste-assimilative capacity of surface water is the amount of dilution provided. If all other factors are equal, a stream with a higher flow will be able to accept greater amounts of pollution without developing objectionable conditions than will a stream with a lesser flow. However, this assimilation capacity during high flows will be affected by non-point contributions, such as urban runoff, bank erosion, and benthic scouring.

Although ground and surface waters are discussed separately in this report, it is important to recognize their interdependence. Since stream flow consists mainly of groundwater contributions during low flow, groundwater storage is a prime consideration in flow maintenance.

When evaluating the capacity of streams to withstand the impacts of pollution, low flows are of critical importance. A basic measure of low flows is the "minimum average seven consecutive day low flow which occurs once every ten years" (MA7CD10). In The Northeast New Jersey Water Quality Management Plan, prepared by NJDEP in 1979, the MA7CD10 flow for the Pompton River was recorded as 0.10 cubic feet per second (CFS) per square mile, which is about five or six percent of the Pompton River's average annual flow rate. The MA7DC10 for the Pequannock River was not recorded in this NJDEP report, however, a USGS gaging station on the Pequannock River in Riverdale (see Figure 10-9) provides information on the flow rates recorded there from October 1993 to October 1997. This station shows low flow rates of about 10 cubic feet per second or about 0.12 CFS per

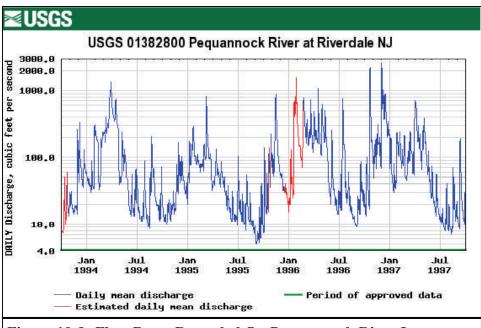


Figure 10-9: Flow Rates Recorded On Pequannock River In Riverdale

Source: USGS National Water Information System Web Interface; <<http://waterdata.usgs.gov/nj/nwis/dv/?site\_no=01382800&amp;referred\_module=sw

square mile of drainage area with the lowest flows recorded in 1995 at about 5 CFS or 0.06 CFS per square mile. A short distance downstream of this site substantial flows enter the Pequannock from the Wanaque River. A steady discharge of about 17 CFS is released from Wanaque Reservoir into the Wanaque River during the summer months. This water more than doubles the typical flow rates on the Pequannock River as it enters Pequannock Township.

The Township's smaller streams, namely Sawmill Creek and the East and West Ditches, would probably have low flow characteristics approaching zero during very dry periods.

Some additional information about the township's streams is available in Appendix H, containing stream inspection reports performed by the Pequannock Environmental Commission that provide location maps, observations, and photographs.

## 10-III. Surface Water Quality

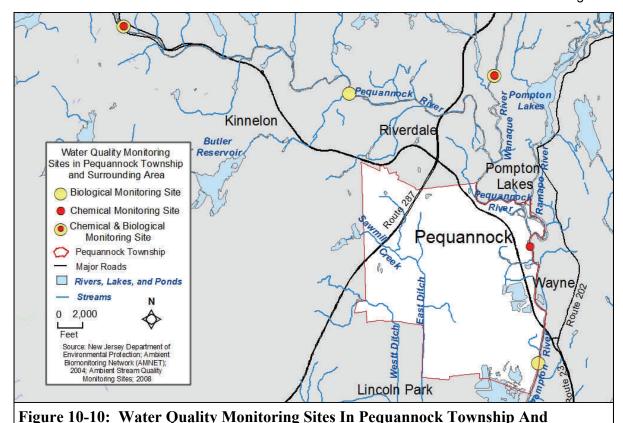
Water quality in New Jersey is tightly regulated by a variety of federal and state programs and regulations. One of the most important is the federal Clean Water Act, which requires each state to establish "designated uses" for waterways within the state. These uses vary with the classification of the waterbody and may be such things as swimming, fishing, or use as wildlife habitat. All of the waterways in Pequannock are classified by NJDEP as Freshwater-2, Non-Trout (FW2-NT) waters. These waters are generally not suitable for trout because of their physical, chemical, or biological characteristics, but are suitable for a wide variety of other fish species.

In all FW2-NT waters, the designated uses are:

- 1. Maintenance, migration and propagation of the natural and established biota;
- 2. Primary and secondary contact recreation;
- 3. Industrial and agricultural water supply;
- 4. Public potable water supply after such treatment as required by law or regulation; and
- 5. Any other reasonable uses.

"Agricultural water supply" means water used for field crops, livestock, horticulture, and silviculture. "Industrial water supply" means water used for processing or cooling. "Primary contact recreation" means activities that involve significant ingestion risks and includes, but is not limited to wading, swimming, diving, surfing, and water skiing. "Secondary contact recreation" means activities where the probability of water ingestion is minimal and includes, but is not limited to boating and fishing.

The state must create water quality standards sufficient to protect these uses, then review each waterway to see if it meets these standards. Every 2 years the state must prepare a "305(b) Report" that includes the status of principal waters in terms of overall water quality and support of designated uses, as well as strategies to maintain and improve



Surrounding Area

water quality. This is used by Congress and USEPA to establish program priorities and funding for federal and state water resource management programs.

Waterways that do not meet the standards are considered "impaired" and are included on a separate report, called the "303(d) list", that is also provided to the federal government every 2 years. In New Jersey the 305(b) and 303(d) reports are combined into one document entitled the "Integrated Water Quality Monitoring and Assessment Report", also known as the "Integrated List".

To determine what waterways may be impaired the NJDEP maintains monitoring networks. The Ambient Surface Water Quality Network was established in 1976 to determine status and trends of surface waters in New Jersey. Currently a network of 115 stations is sampled four times per year. A wide range of conventional parameters, metals, pesticides/volatile organic carbon (VOC's) and sediments are monitored in this program.

In 1992, the NJDEP's Bureau of Freshwater & Biological Monitoring reactivated its Ambient Biomonitoring Network (AMNET) which, at the time of its last sampling in 1988, consisted of only 18 sampling sites statewide. The old network was determined to be inadequate to support the NJDEP's needs, so bureau staff designed a new program. The new program established sampling stations in every sub-watershed, statewide, where the health of instream benthic macroinvertebrate communities (bottom dwelling organisms visible to the naked eye) would be sampled on a rotational schedule of once every five years. Visual observations, stream habitat assessments and limited physical/chemical parameters are also

performed on each site. At present 820 sampling sites have been established. Figure 10-10 illustrates the location of the water quality testing stations operated by NJDEP in Pequannock and surrounding towns.

The principal source of the degradation of surface water quality in Pequannock and across our region is the non-point source pollution caused by urban-suburban development. In general, water quality declines downstream, from these non-point sources including runoff from roads, construction, urban surfaces, and storm sewers.

Pequannock Township's principal streams include the Pequannock River, the Pompton River, East Ditch, West Ditch, and Sawmill Creek (see Figure 10-3). The Pompton River is formed as the Pequannock and Ramapo Rivers converge, and flows southerly for about seven miles into the Passaic River in Lincoln Park. It marks the eastern boundary of the Township of Pequannock. In total, 4 watersheds are in the Pequannock Township area (see Figure 10-2), and all are tributaries of the Passaic River.

The Pequannock River is about 30 miles long and drains an area of 205 square miles, which includes about 108 square miles of drainage area associated with the Wanaque River, a major tributary of the Pequannock River. The headwaters of the Pequannock River are in Sussex County and the river flows easterly, delineating the Morris/Passaic County Line, and joining the Wanaque River and the Ramapo River to become the Pompton River in Pequannock. The headwaters of the watershed have numerous lakes, ponds, and reservoirs. The City of Newark owns 35,000 acres of the watershed and has four reservoirs in the area. Most of the land in the Newark-owned watershed is forested and much of it has been permanently protected with state conservation easements.

Water quality on the Pequannock River is monitored primarily at the Macopin Gage in southern West Milford. For the 2006 Integrated List several problems were reported with water quality in that segment of the Pequannock River. These included excessive levels of chlordane, DDD, mercury, PCBs, DDE, and DDT. In addition, water temperatures were recorded in excess of state standards and dissolved oxygen levels were measured below state standards. Despite these concerns, water quality in the Pequannock River overall is considered quite good. It is one of the few rivers in our area to support "Primary Contact Recreation" such as swimming and the upper reaches of this river segment, from the Macopin Gage to Hamburg Turnpike in Riverdale, host a population of wild trout, another prime indicator of high water quality. The river is also shown as fully supporting other uses including Secondary Contact Recreation, Drinking Water Supply, Agricultural Water Supply, and Industrial Water Supply. Due to the reported temperature problems the river is listed as "Impaired" for the "Aquatic Life (general)" and "Aquatic Life (trout)" categories. However, it should be noted that all the waters within Pequannock Township are "non-trout" where this particular impairment has no impact.

North of the Township's border, the Pequannock River is joined by the Wanaque River. The 2006 Integrated List reports excessive levels of phosphorus in the lower segment of the Wanaque River and some biological degradation due to unknown elements. For these reasons the Wanaque Rive is shown as not supporting the uses of Primary Contact Recreation and Secondary Contact Recreation. The designated uses of Drinking Water Supply,

Agricultural Water Supply, and Industrial Water Supply are fully supported. In addition, like the Pequannock, the Wanaque River from the Wanaque Reservoir to Pompton Lakes hosts a population of wild trout. The reported water quality problems cause impairment in the categories of "Aquatic Life (general)" and "Aquatic Life (trout)".

Approximately 1.5 miles downstream of the point where the Wanaque River enters the Pequannock River, the Pequannock River joins with the Ramapo River to form the Pompton River.

The Ramapo River begins in Orange County, New York flowing in a southerly direction, crossing into New Jersey east of the Ramapo Mountains. It has a length of about 30 miles and a watershed area of 161 square miles. The 2006 Integrated List shows water quality problems in the Ramapo involving excessive levels of phosphorus, low dissolved oxygen levels and pH problems. For these reasons the Ramapo River fails to support use for Primary Contact Recreation and is listed as impaired for Aquatic Life (general) and Aquatic Life (trout). The report showed insufficient data to make a determination as to Secondary Contact Recreation. The river does support the uses of Drinking Water Supply, Agricultural Water Supply, and Industrial Water Supply.

Formed by the union of the Pequannock River and Ramapo River, the Pompton River flows through a relatively flat and suburban area to the Passaic River, a distance of about seven miles. The Pompton River's drainage area is about 378 square miles, which includes the drainage area of its major tributaries; the Pequannock River, the Wanaque River, the Ramapo River, and within Pequannock Township, Sawmill Creek, and the East and West Ditches.

The water quality requirements for the Pompton River are less stringent than those for the Wanaque River and Pequannock River due to the Pompton's "non-trout" classification. The Integrated List shows excessive levels of chlordane, DDD, mercury, PCBs, Phosphorus, DDE and DDT in the river as well as biological degradation due to unknown elements. For these reasons the Pompton River is shown as not supporting the uses of Primary Contact Recreation and Drinking Water Supply. It fully supports the uses of Secondary Contact Recreation, Agricultural Water Supply, and Industrial Water Supply. It is listed as impaired for Aquatic Life (general). It should be noted that the Pompton River is, in fact, used as a potable water supply and with proper treatment is adequate for that purpose. However, the river in its existing state does not meet the standards that have been set for this designated use.

Sawmill Creek flows into East Ditch in Pequannock, which flows due south through the Bog and Vly Meadows in Lincoln Park, eventually reaching Beaver Dam Brook, which flows easterly to the Pompton River. The total drainage area of East Ditch, at its confluence with Beaver Dam Brook, is about 4.7 square miles. West Ditch also flows south through the Bog and Vly into Beaver Dam Brook. At its confluence with Beaver Dam Brook, the West Ditch drainage area is about 2.4 square miles. The watersheds of these streams vary from woodland to agricultural lands, suburban areas and extensive wetlands. These waterways are not monitored, so no information on water quality is available. All of these streams eventually drain into the Pompton River.

Another state program designed to protect water quality is the New Jersey Pollutant Discharge Elimination System (NJPDES). The NJPDES program protects New Jersey's ground and surface water quality by assuring the proper treatment and discharge of wastewater and stormwater from various types of facilities and activities. To accomplish this, permits are issued limiting the mass and/or concentration of pollutants which may be discharged into ground water, streams, rivers, and the ocean. The types of regulated facilities can range from very small users such as campgrounds, schools, and shopping centers to larger industrial and municipal wastewater dischargers.

There are 2 NJPDES permitted discharges within Pequannock or on its borders (see Figure 10-11). However, inspections by the Pequannock Township Environmental Commission in 2009 indicate that both of these discharges were no longer operating. Whether these discharges will resume at some future date will depend upon whether these NJPDES permits are renewed when they are due to expire.

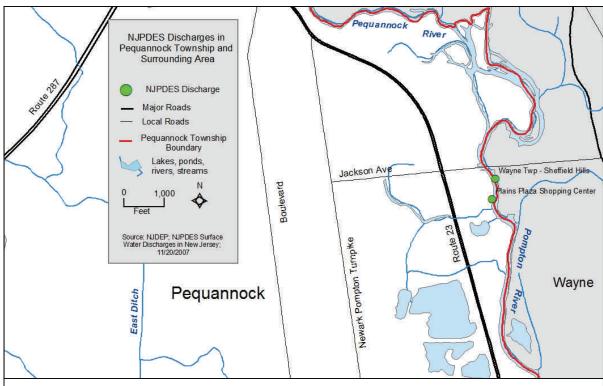


Figure 10-11: NJPDES Discharges Of Pequannock Township And Surrounding Area

## 10-IV. Groundwater Hydrology

Groundwater is subsurface water occurring in fully saturated soils and geologic formations, not as isolated bodies of underground water, but rather as integral parts of the hydrologic cycle discussed earlier in this report. The recovery of groundwater for household, commercial, industrial and other uses is dependent on the physical characteristics of the local geology. Bedrock or overburden which is capable of storing and yielding a high rate of ground water is called an "aquifer." Groundwater provides the great majority of Pequannock's water supply and maintains base flows for all of Pequannock's streams. Preserving both the quality and quantity of Pequannock's groundwater resources should be a high priority in the township's planning objectives.

As discussed in the "Geology" section of this report, much of Pequannock lies in the Piedmont Physiographic Province, underlain by the Brunswick Formation, a reddish-brown shale and sandstone, with an overburden of stratified drift deposits left over from the Wisconsin Glaciation. A geologic report by Walter J. Spink, Ph.D., APGS, prepared in January 1977, documented that a buried river valley in Pequannock is filled with unconsolidated sediments that generally consist of sands near the surface, sand and gravel near the bottom, and an intervening layer of silt and clay. In Pequannock, the higher sands form an upper groundwater aquifer, while the lower sands and gravel form a lower groundwater aquifer. Figure 10-12 depicts the sub-surface conditions of these aquifers in cross section.

Most recharge of the lower aquifer is derived from the underlying Brunswick Shale, which is supplied by precipitation on the adjacent upland areas. The upper aquifer is recharged directly from precipitation and from septic systems. In the sewered areas of the township, water derived from groundwater is discharged to surface waters far downstream of Pequannock. In areas served by septic systems, the septic system effluent is discharged directly into the upper aquifer.

According to the <u>Land Oriented Reference Data System</u> (LORDS), published by the New Jersey Geological Survey in 1974, the Brunswick Formation has a groundwater recovery rate of 350,000 gallons per day per square mile (gpd/sq.mi.) in a year of normal rainfall and 225,000 gpd/sq.mi. in a year of low rainfall. This is equivalent to 547 gpd per acre in years of normal rainfall and 351 gpd in years of low rainfall. Therefore, based on the LORDS data, the maximum average groundwater withdrawal possible, within the Piedmont Province portion of Pequannock, without "mining" the aquifer and possibly adversely affecting the stream base flows during periods of drought, would be 351 gallons per day per acre, or about 4.7 inches per year. These numbers would be applicable to Pequannock's lower aquifer.

Similarly, the New Jersey State Planning Commission's technical reference document entitled <u>Development of Nitrate Dilution Model</u> dated February 1988, estimated that in a normal year, the amount of aquifer infiltration is ten inches per year (744 gpd per acre) for the Brunswick Formation and nine inches per year (670 gpd per acre) for a dry year. These numbers, according to the above reference document, represent the quantity of precipitation that infiltrates the *shallow aquifer*, and is available to mix with the groundwater and septic effluent.

In the part of Pequannock that is in the Highlands Province, underlain by the Precambrian Formation, the LORDS survey estimates the normal year groundwater recovery rate at 250,000 gpd/sq.mi. (391 gpd per acre) or 5.2 inches per year. The dry year rate is 170,000 gpd/sq.mi. (266 gpd per acre) or 3.6 inches per year.

The New Jersey State Planning Commission estimates that the aquifer recharge rate for the Highlands area in the Precambrian Formation as eight inches per year in a normal year and four inches in a dry year.

In 1980, Pequannock contracted an engineering firm, Malcolm Pirnie Inc., to conduct an investigation into the nature and extent of the aquifer recharge areas in the township. The aquifer, which underlies the water table, supplies the water for the township wells. This study produced a map that delineated the aquifer recharge area (see Figure 10-13). Two different recharge areas are shown on the map based on two different approaches. These

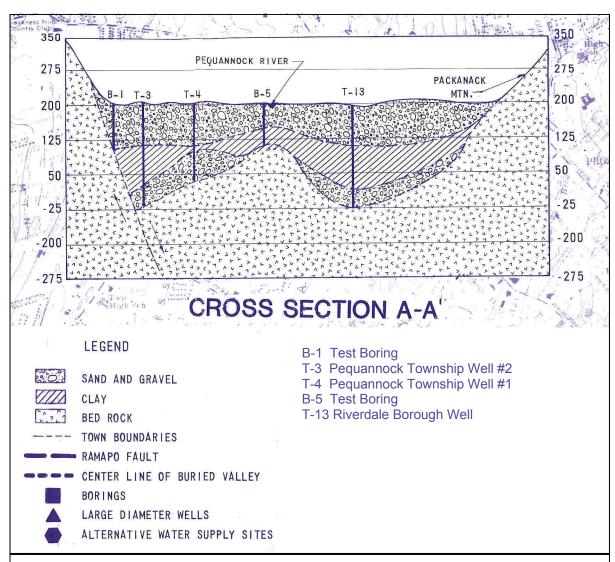


Figure 10-12: Map Reproduced From "Ground-Water Supply Survey for Township of Pequannock New Jersey" By Malcolm Pirnie, Inc., July, 1980

areas total 1,200 acres and 3,400 acres, respectively. According to the study, "For the first approach, the aquifer was considered to be unconfined, and boundaries were assumed to be major surface streams of the area. The boundaries for this unconfined aquifer system, under these assumptions, are the Pequannock River to the north and east, the upper limits of the drainage basin to the west, and a line drawn just south of the Township wells. This line was chosen based on ground-water flow in this area which is generally to the south, therefore any water falling south of this line would not recharge the aquifer as delineated. This area is approximately 1,200 acres." This 1,200 acre "area of influence" has a potential to be recharged from the overlying water table.

In contrast, the 3,400 acre area of recharge depicts the full extent of the recharge area for a semi-confined aquifer. Separated from the water table by a layer of fine silts and clay, the study describes the semi-confined aquifer as "leaky," because there is a small vertical flow between the upper water table and the lower aquifer, and explains that this kind of aquifer receives water from a large surface area, not necessarily directly above. According to the study, "The second approach is to assume that the aquifer is semi-confined (leaky) and the rivers are not boundaries. The aquifer is bounded only by the areal extent of the well drained soils within the local drainage basin and upgradient from the wells. This area is estimated at 3,400 acres."

More recently, the New Jersey Geological Survey assembled the various factors affecting recharge such as soils, slopes, bedrock, and rainfall into a method for estimating ground water recharge. The condition of the land was also considered since forested land will have the highest recharge value. Forests tend to increase the infiltration of water and reduce surface runoff, while developed lands with large areas of impervious cover such as roads, parking lots, and buildings, prevent the penetration of water into soils and promote surface runoff. A map depicting these estimated recharge rates for Pequannock is shown in Figure 10-14.

As shown in this Figure, the highest recharge rates are found along the Ramapo Fault, close to Rt. 287. Although not all the areas having higher levels of recharge are located in places important to Pequannock's public water supply, they do help to maintain local stream and river flows during low-rainfall periods, as well as preventing excessive runoff and flooding during storm events. Therefore, areas with higher recharge potential should be recognized and protected.

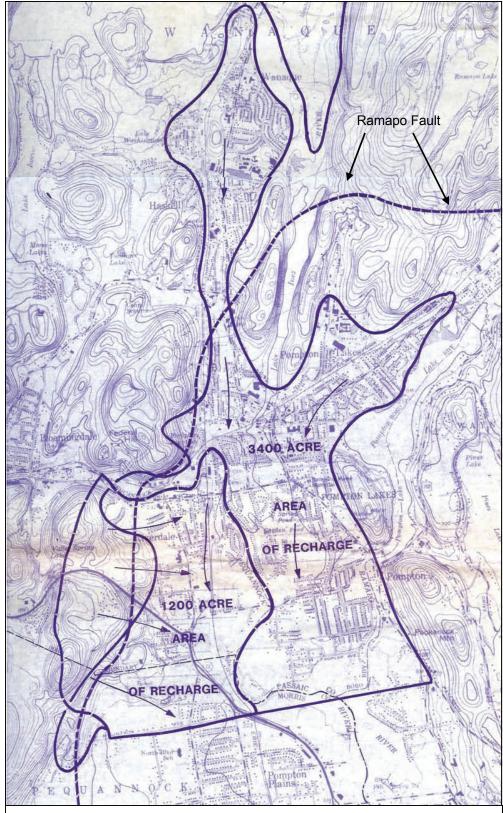
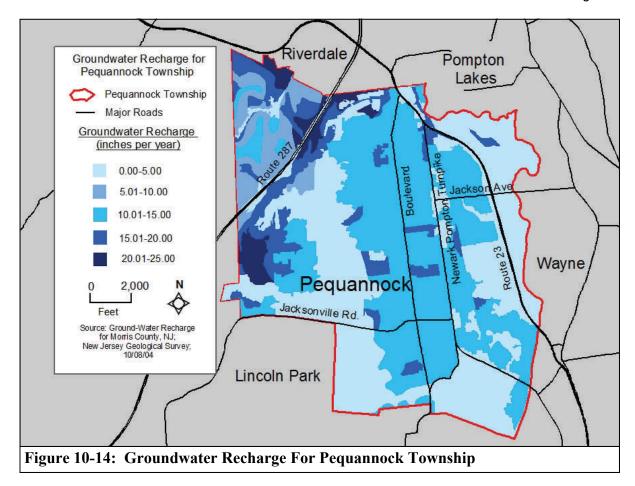


Figure 10-13: Recharge Areas And Groundwater Flow Plan, Malcolm Pirnie, Inc. 1980



### 10-V. Groundwater Quality

As described in Section x-x, Pequannock's upper aquifer is recharged directly by both precipitation and septic effluent, and is thus subject to potential contamination from septic facilities and surface contaminants. Given the existing density of development in the township, it would not be unexpected for this aquifer to show some evidence of contamination such as somewhat elevated levels of nitrates, and indeed, investigation conducted by Malcolm Pirnie, Inc. in the early 1980's confirmed that to some extent, septic systems affect water quality in the upper aquifer. This is important for two reasons: first, the upper aquifer serves to directly provide base flows to Pequannock's streams, and second, if an excessive amount of water is pumped out of the lower aquifer, the recharge from the upper aquifer and surface water sources can increase the potential for contamination of the lower aquifer.

In addition, more recent sampling has determined that excessive levels of sodium are present in water derived from Pequannock's public wells. The 2008 Water Quality Report for Pequannock Township (attached in Appendix D) showed a sodium level from these wells of 89.4 parts per million (ppm) where the standard is 50 ppm. Potential sources of this sodium are road salts, and to a lesser extent, the derivatives from some water softening processes. The most commonly used "salt" for deicing roads, highways and parking lots is sodium chloride.

According to the USEPA, sodium is associated with general human health concerns. It can contribute to or affect cardiovascular, kidney, and liver diseases, and has a direct link to high blood pressure. The USEPA states that elevated sodium levels in sources of drinking water could prove dangerous, and dietary intake of sodium should be restricted. This topic is explored further in the section on "Water Supply."

The same township water quality report showed excessive "hardness" of water from these public wells. The hardness was 350 ppm where the standard is 50-250 ppm. Hardness is a characteristic of water caused primarily by salts of calcium and magnesium. The Wilkes University Center for Environmental Quality, Environmental Engineering, and Earth Sciences described the source of these minerals as follows:

"Water is a good solvent and picks up impurities easily. Pure water -- tasteless, colorless, and odorless -- is often called the universal solvent. When water is combined with carbon dioxide to form very weak carbonic acid, an even better solvent results. As water moves through soil and rock, it dissolves very small amounts of minerals and holds them in solution. Calcium and magnesium dissolved in water are the two most common minerals that make water 'hard.' The degree of hardness becomes greater as the calcium and magnesium content increases..."

This means the level of hardness in an aquifer depends both on the mineral composition of soils and bedrock overlying the aquifer as well as the acidity of the water flowing into the aquifer.

Hard water poses no health hazards. On the contrary, the National Research Council reports that hard drinking water often contributes beneficial calcium and magnesium to the human diet. However, hard water does cause difficulty with the use of soap and detergent, can cause soap residue to lodge in fabric during washing to make fabric stiff and rough or cause graying of white fabric and the loss of brightness in color fabric. Heated hard water in appliances such as hot water heaters can form a scale of calcium and magnesium minerals that can contribute to the inefficient operation or failure of these appliances. Pipes can become clogged with this scale, reducing water flow and ultimately requiring pipe replacement. This topic is addressed further in the section on "Water Supply."

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# 11. Vegetation and Wildlife

## 11-I. Vegetation

One of the primary functions of vegetation in earth's ecosystem is the maintenance of the breathable atmosphere through photosynthesis, a process in which green plants use the energy of the sun to transform carbon dioxide into oxygen. Plants filter dust and other impurities from the air, provide food and shelter for animals, and in our human communities, among countless other benefits, provide shade and beauty. Plants also stabilize soils and regulate the infiltration, evapo-transpiration, and runoff rate of rainfall. Erosion control, water quality, climate control, and habitat character are all determined in great measure by the amounts and types of vegetation.

Although much of Pequannock's natural vegetation is typical of the geographic region in which it is located, in the developed areas of the township the vegetation can not be so easily classified. Where the residential, commercial and industrial sections have been either landscaped, paved, or disturbed during construction, invasive "exotic" species such as tree-of-heaven, Japanese honeysuckle, Norway maple, black locust, Japanese knotweed, purple loosestrife, and multiflora rose have flourished while denying habitat for native species. Japanese knotweed is particularly pervasive, occupying large areas in Pequannock's parks

and public lands.

Similarly, the wetlands and uplands which have been farmed extensively for many years no longer contain exclusively native species. However, many of the undeveloped areas display the normal range of native plants. Typical natural vegetation in these areas is described immediately below and in the Wetlands section.

The highest, driest ridgetops of Pequannock support limited growth



Figure 11-1: Japanese Knotweed, Mountainside Park

of the few species that can tolerate these difficult conditions. These include trees like the eastern redcedar, gray birch, scrub oak, with plants such as blackberry, and grasses in open areas.

In the "xeric" chestnut oak forest of the drier ridgetops, slopes, and outcroppings, found in the Highlands portion of Pequannock, the dominant species, chestnut oak, grows among the red oak, white oak, scarlet oak, sweet birch and pitch pine. Less common members of this community are black oak, red maple, hickory, black cherry, and white pine. The understory



Figure 11-2: Eastern Redcedar And Blackberries On Ridgetop, Mountainside Park

growth consists of chestnut suckers, mountain laurel, and blueberry, with occasional specimens of striped bark maple and green barked maple with white stripes.

In the mesic uplands, three forest types can be found: mixed oak, sugar maplemixed hardwood, and hemlock-

mixed hardwoods. The mixed oak forest is primarily composed of red oak, white oak, and

black oak, with chestnut oak, scarlet oak, hickory, red maple, sugar maple, white ash, American beech, and tulip poplar also present. Understory trees are flowering dogwood, white sassafras, hop hornbeam, and ironwood and shrubs are viburnum and spicebush. Herbaceous groundcovers include mayapple, Virginia creeper, Dutchman's breeches, downy rattlesnake plantain.



Figure 11-3: Typical Chestnut Oak Forest In Mountainside Park

American liverleaf, stinking Benjamin, and Indian pipes, an interesting flowering plant that lacks chlorophyll in its tissues.

The sugar maple-mixed hardwoods forest type contains sugar maple, yellow birch, sweet birch, American beech, American linden, white ash, red maple, red oak, white oak, tulip poplar, cherry, and others. Understory trees include hop hornbeam, flowering dogwood, ironwood, and white sassafras. Viburnum and spicebush grow as shrubs, and the herbaceous layer is similar to the mixed oak forest type.

Hemlock-mixed hardwood forest types include the dominant hemlock, with some sweet birch, yellow birch, American beech, white ash, red oak, sugar maple, and red maple.



Figure 11-4: Hemlock-mixed Hardwood Forest In Mountainside Park

There is very little understory due to the thick canopy of hemlock, though some partridge berry and Canada mayflower survive among the mosses. Sadly, this forest type is vanishing from New Jersey, a victim of the "hemlock wooly adelgid".

#### 11-II. Wetlands

Although swamps, bogs, and marshes were once considered as waste land, and various measures to reclaim these "unproductive" areas such as draining, filling, and paving,

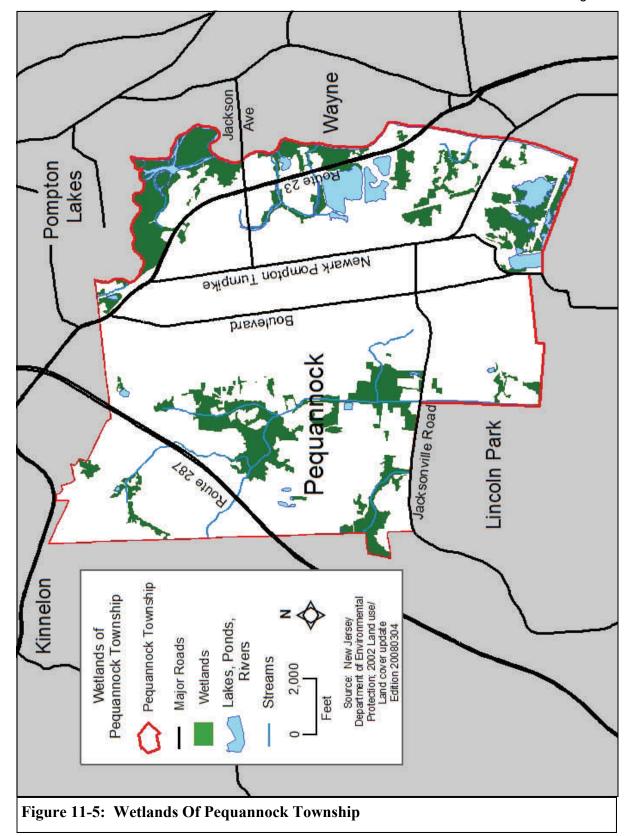
were implemented in many areas, scientists would now agree that for many reasons wetlands are valuable natural resources. Wetlands support a diversity of plant and animal life, providing habitat for many of the protected plant and animal species and rare natural communities. Wetlands help in controlling floods, acting as natural detention basins to store excessive amounts of stormwater to stabilize stream flow, and to provide areas for aquifer recharge. The water is purified before it re-enters the groundwater, by natural settling of contaminants.

In 1987, the New Jersey Legislature passed the Freshwater Wetlands Protection Act (NJAC 7:7A), which defines freshwater wetlands as follows:

"...an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation; provided, however, that the Department, in designating a wetland, shall use the three parameter approach (that is, hydrology, soils, and vegetation) enumerated in the 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands, and any subsequent amendments thereto incorporated herein by reference."

The state regulations provide varying levels of protection to wetlands depending on their sensitivity or relative resource value. For example, wetlands draining to waterways with spawning trout populations or wetlands known to provide habitat to threatened or endangered species are considered to have "Exceptional Resource Value" and receive added protection such as wider protective buffers.

Figure 11-5 depicts the location of wetlands in Pequannock Township. The largest



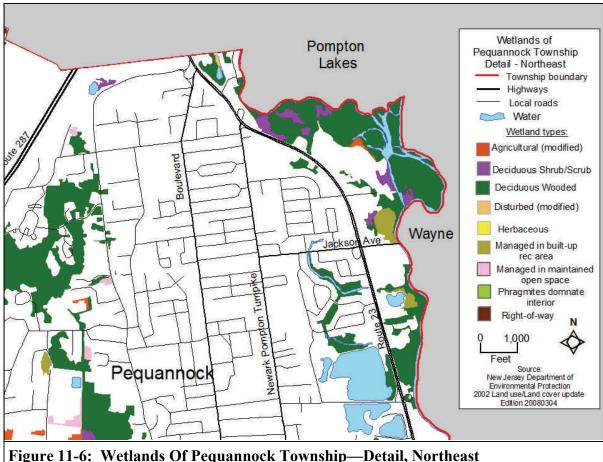


Figure 11-6: Wetlands Of Pequannock Township—Detail, Northeast

wetlands are associated with low-lying areas near waterbodies such as the lands near Woodland Lake, the flood plain along the Pequannock and Pompton Rivers, property adjoining the East Ditch and West Ditch, and sections of the Pio Costa tract in the southern portion of the township. Protection of these areas will ensure the continuance of wildlife habitat, public recreation, stormwater management and flood control. These wetlands are of various types as shown in Figures 11-5 and 11-6. Deciduous wooded wetlands are the most common type in Pequannock.

It must be noted that these maps show the probable location of wetlands, however, the exact location and extent of these wetlands must be verified on a site by site basis.

Soils associated with wetland conditions are known as hydric soils. In Pequannock, there are a number of locations in which hydric soils may be found. Figure 11-7 and Table 11-1 describe the mapped hydric soils of Pequannock Township.

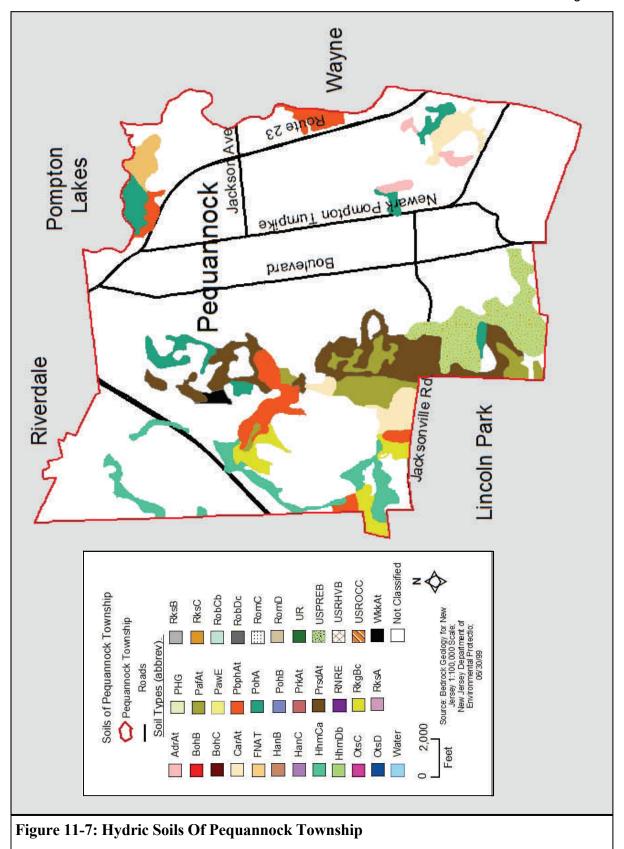


Table 11-1: Rela	ntionship Of Map Symbols To Soil Names And Descrip	tions
Map Symbol	Description	Name/Series
AdrAt	Adrian muck	Adrian
CarAt	Carlisle muck, 0-2 percent slopes, frequently flooded	Carlisle
FNAT	Fluvaquents and udifluvents, 0-3 percent slopes, frequently flooded	Fluvaquents
HhmCa	Hibernia loam, 3-15 percent slopes, stony	Hibernia
PafAt	Palms muck, 0-2 percent slopes, frequently flooded	Palms
PbphAt	Parsippany silt loam, sandy loam substratum, 0-3 percent slopes	Parsippany
PohA	Pompton sandy loam, 0-3 percent slopes	Pompton
PrsdAt	Preakness dark surface variant sandy loam, 0-3 percent slopes, frequently flooded	Preakness
RkgBc	Ridgebury loam, 0-8 percent slopes, extremely stony	Ridgebury
USPREB	Urban land-Preakness complex, 0-8 percent slopes	Urban Land
WkkAt	Willette muck, 0-2 percent slopes, frequently flooded	Willette

### 11-III. Wildlife

As the most complex part of any ecosystem, the stability of the wildlife population in a given habitat is a good indicator that other aspects of the natural environment are relatively stable. Wildlife communities are interdependent on many other factors in the natural environment, including water quality, vegetation, and climate. Observable changes in wildlife populations can be used to evaluate these environmental conditions.

During prehistoric times in the Pleistocene epoch, there is evidence that both the elk-moose and the Greenland caribou lived in the Highlands region, as well as the mastodon and the woolly mammoth. The giant beaver was an early resident of lakes and streams. More recently, the gray wolf, mountain lion, beaver, and elk, among others, are known to have lived in the area, but have been extirpated within the last two centuries.

Pequannock's present wildlife population still contains many of its original native animals. The variety of land types, ranging from the rocky, wooded uplands of the Highlands region, to the wetlands bordering streams and larger rivers, has produced a corresponding variety in Pequannock's wildlife.



Figure 11-8: Goldfinch
Photo by Don Pruden



Figure 11-9: Mink On Bank Of Pequannock River Photo by Don Pruden

Some animals, such as the eastern cottontail rabbit, striped skunk, raccoon, groundhog, opossum, grey squirrel, and red fox, or birds like the robin, blue jay, crow, mourning dove, and our state bird, the goldfinch, are well-adapted to living in suburban or even urban areas as long as a minimum of suitable habitat is maintained. All are frequently sighted in Pequannock.

The continued presence of aquatic animals and birds including mink, otters, muskrat, beaver and various species of ducks and herons, attests to the extensive riparian habitat that remains along the Pequannock River, Pompton River and various streams, lakes and ponds in Pequannock. Natural buffers along these waterways,



Figure 11-10: Tree Felled By Beaver On Shore Of Pequannock River (Aquatic Park)

separating developed areas from the waterways, are essential to this wildlife and provide critical corridors that allow them to move from one area to another.

Otters for example, require extensive home ranges covering 20 to 30 linear miles along waterways. Signs of otters have been confirmed on both the Pequannock and Pompton Rivers and it is likely they utilize other waterbodies in the township.

Beaver also need extensive areas of riparian habitat. Beaver

feeding sign is persistent on the Pequannock River (see Figure 11-10) but other signs of habitation, such as lodges or dams have not been documented. For now, beavers seem to be occasional visitors to the Township. Mink and muskrat are less demanding in their requirements and make use of almost all of Pequannock's waterways and wetlands. Although important to aquatic animals, riparian corridors also provide travel routes for terrestrial animals. Figure 11-11 shows the use of a stream culvert by a coyote traveling under Route 287.

Despite significant development, Pequannock still offers living space for some of New Jersey's rarest animals and birds. Table 11-2 provides a list of the threatened and endangered species in Pequannock Township and their current status in New Jersey. Through an initiative known as the Landscape Project the state has been identifying and mapping areas supporting these rare and threatened species. Within Pequannock, wetlands and larger forested lands support the rarest wildlife. For example, habitat for

bobcat exists in the forested lands north of Rt. 287 near Mountainside Park. This area also provides habitat for the barred owl and red-shouldered hawk.

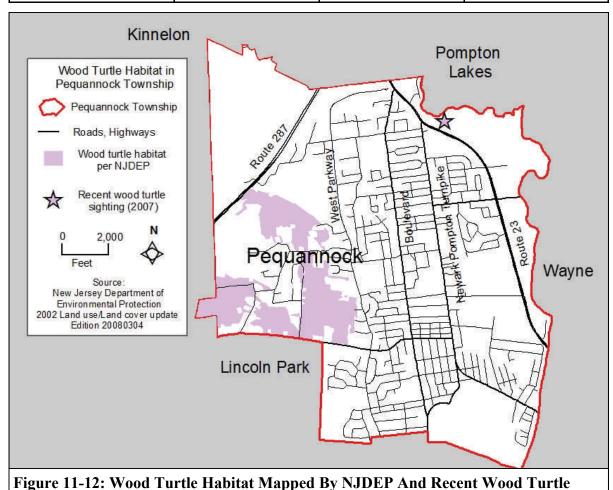
Southeast of Rt. 287, woodland and wetlands along Sawmill Creek, the East Ditch, and West Ditch from Mountain Ave south to the Lincoln Park border, also offer habitat for



Figure 11-11: Tracks Of Eastern Coyote Entering Stream Culvert Beneath Rt. 287 Near Mountainside Park.

**Table 11-2: Threatened and Endangered Wildlife of Pequannock Township** (Source: NJDEP Natural Heritage Program, 10/23/08)

Common Name	Scientific Name	State Status of Breeding Population	State Status of Migratory/Winter Population
Barred owl	Strix varia	Threatened	Threatened
Bobcat	Lynx rufus	Endangered	n/a
Great blue heron	Ardea Herodias	Special Concern	Stable
Red-shouldered hawk	Buteo lineatus	Endangered	Threatened
Wood turtle	Glyptemys insculpta	Threatened	n/a



Pequannock Township Environmental Resource Inventory

Sighting

barred owl and red-shouldered hawk, as well as for wood turtle. In addition, these lands serve as foraging sites for Great Blue Heron.

More habitat for redshouldered hawk is mapped in the northern section of Aquatic Park near Riverdale, and in scattered wetlands that follow the abandoned New York Susquehanna and Western rail line, extending from near Schelling Terrace in the north to Oakwood Ave in the south near the Pequannock River. In February of 2009, a bald eagle was sighted at Aquatic Park.



Figure 11-13: Wood turtle

Other Great Blue Heron foraging sites are mapped in the wetlands surrounding the Pio Costa tract in southwest Pequannock, along the Pompton River and Pequannock Rivers, near Woodland Lake and Macdonald's Pond, and in most smaller wetlands areas

across Pequannock.

Detailed mapping has been done by the state of habitat for the wood turtle. Figure 11-12 shows potential wood turtle habitat mapped by the NJDEP and a recent wood turtle sighting, reported in 2007.

Although there are presently no confirmed sightings, there is certainly potential for other rare wildlife, including timber rattlesnakes, goshawk and similar forest-related species in the expansive woodland within and surrounding Mountainside Park. In addition, the full habitat usage of those species that have been reported within Pequannock may change and/or expand over time.

It is surprising to know that many species considered common today, like the wild turkey, whitetail deer



Figure 11-14: Black Bear Tracks In Mountainside Park

and black bear, were once eliminated due to overharvest and habitat loss. They have returned to Pequannock Township in response to more restrictive hunting regulations, and due to the many acres of cleared pasture that have reverted back to the forest cover favored by these species. In the case of whitetail deer, this resurgence is so great that at some point in the future the Township of Pequannock will face the problem of managing these deer. Deer are prolific, with females typically producing 2 offspring each year. Left unchecked, this population growth eventually exceeds the carrying capacity of the land, leading to overbrowsing of vegetation. This often benefits non-native vegetation that deer do not utilize, and results in degradation of the overall habitat for a wide range of birds and animals. Added to this is the increased frequency of car/deer collisions on Pequannock's roadways.

While controversial, controlled hunting has been shown to be an effective and viable option for keeping deer herds in balance with the land. Groups like the NJ Audubon Society and the NJ Conservation Foundation have begun using controlled hunting to reduce these problems on the lands they manage in New Jersey.

Black bear numbers have also increased dramatically, to the point where bears have become a nuisance in some areas. The majority of black bear habitat in Pequannock lies in Mountainside Park. However, bears are reported in other parts of the township on occasion.

Some other animals and birds have expanded their range across the northeast to populate new areas, including Pequannock. Good examples are the black vulture, once exclusively a southern bird, and the coyote, originally limited to the western states. Also, non-native species that were introduced to the U.S. now make their homes in Pequannock. Among these are the European starling, the mute swan, the rock pigeon, the Norway rat, and the English sparrow.

In addition to the threatened wood turtle, reptiles such as painted turtles, and snapping turtles, and amphibians like green and bull frogs inhabit Pequannock's lakes, ponds and slow-moving waterways such as Woodland Lake, the Pequannock and Pompton Rivers, the West Ditch and the East Ditch. Species associated with upland areas, such as salamanders, wood frogs and tree frogs can be found in association with wetlands and smaller headwater streams like Sawmill Creek. Higher, drier terrain like the ridgetops in Mountainside Park are home to the area's only lizard, the five-lined skink.

Appendix E contains a list of birds observed in Pequannock by the New Jersey Audubon Society. Also contained in this appendix are lists of mammals, reptiles, amphibians and fish known or believed to inhabit Pequannock Township. Appendix F provides specific information from the NJDEP Natural Heritage Data Base on the threatened and endangered species of plants found within Morris County.

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# 12. Air and Air Quality

Air pollution can be defined as "the presence in the outdoor atmosphere of one or more contaminants, such as dust, fumes, gas, mist, odor, smoke or vapor in quantities, of characteristics, and of duration, such as to be injurious to human, plant, or animal life or to property, or which unreasonable interferes with the comfortable enjoyment of life and property." Air pollution is not a new or recent phenomenon and is not always manmade. Natural disasters such as forest fires, volcanoes, dust storms, swamp gas, and even lightning can cause problems in air quality.

In general, air pollution is monitored to protect public health and welfare, and standards are set to limit acceptable amounts of airborne contaminants, as defined by scientific studies concerning the effects of these contaminants. The most important regulatory framework for controlling air pollution arrived with the passage of the Clean Air Act in 1970.

In 1999 the USEPA compiled a National-scale Air Toxics Assessment (NATA) that examines exposure to over 100 hazardous air pollutants throughout the country. The assessment followed the four step process listed below.

## 1. Emission Inventory Preparation

The emission inventory describes the type and amount of emissions of Hazardous Air Pollutants (HAPs) from a wide variety of sources. USEPA divides the sources into four categories:

- •Major (large manufacturing facilities, utilities, etc.)
- •Area/nonpoint (small industrial facilities, dry cleaners, residential fuel combustion, consumer product use, etc.)
- •On-road mobile (cars, trucks and buses)
- •Nonroad mobile (construction equipment, agricultural vehicles, etc.). USEPA Compiles this information into the National Emissions Inventory (NEI) every three years.

### 2. Predicting Air Concentrations

The USEPA used a sophisticated dispersion model, known as ASPEN, to predict how the pollutants from the sources in the emission inventory would move through the air and be distributed throughout the country.

## 3. Calculating Exposure

USEPA also took the extra step of trying to adjust the predicted air concentrations to account for activity patterns that move people around during the day, thus making their exposure a composite of multiple concentrations experienced in various places.

#### 4. Risk Characterization

In this step, USEPA considers the risk of both cancer and non-cancer effects from inhalation of these hazardous air pollutants nationwide. In this analysis they were able to identify the pollutants posing the most cancer risk nationwide. They also identified one non-carcinogen (acrolein) as posing the greatest relative hazard for health effects other than cancer.

Although the results are not refined enough to suggest specific risk-based regulatory action, the USEPA expects that the assessment results can help to:

- Identify air toxics of greatest potential concern.
- Characterize the relative contributions to air toxics concentrations and population exposures of different types of air toxics emissions sources (e.g. major, mobile).
- Set priorities for the collection of additional air toxics data and research to improve estimates of air toxics concentrations and their potential public health impacts. Important additional data collection activities will include upgraded emission inventory information, ambient toxics monitoring, and information on adverse effects to health and the environment
- Track trends over time in modeled ambient concentrations of toxics.
- Measure progress toward meeting goals for risk reduction from inhalation of ambient

The NJDEP analysis of the state and county average air toxics concentrations generated by NATA indicates that 22 of the pollutants were predicted to exceed their health benchmarks in one or more counties in 1999. 21 of these are cancer-causing (carcinogenic) chemicals, and one (acrolein) is not carcinogenic. Predicted concentrations of these pollutants vary around the state, depending on the type of sources that emit them. Table 12-1 shows the comparison for Morris County between the modeled air concentrations of these substances and the health benchmarks for the same substances. In total 14 of the 19 pollutants had predicted concentrations that exceeded the health benchmarks. These are highlighted in red on Table 12-1.

However, not all air quality monitoring depends on models and predictions. In 2005, the NJDEP Bureau of Air Monitoring maintained 43 Ambient Air Monitoring Sites in New Jersey. These monitoring sites are designed to fulfill the following monitoring objectives for federal and state regulated pollutants: to measure maximum pollutant concentrations, to assess population exposure, to determine the impact of major pollution sources, to measure background levels, to determine the extent of regional pollutant transport, and to measure secondary impacts in rural areas. In addition, monitoring data are provided to various public and media outlets and are used to provide hourly updates on air quality to the Bureau's web page at www.state.nj.us/dep/airmon. The Air Monitoring Sites can be divided into two primary networks: the Continuous Monitoring Network and the Manual Sampling Network.

The Continuous Monitoring Network consists of sites which measure carbon monoxide (CO), oxides of nitrogen (NOx), ozone (O3), sulfur dioxide (SO2), particulate matter, and meteorological data by automated instruments (not all pollutants are measured at all sites). The data is transmitted to a centralized computer system in Trenton, New Jersey, once every minute, thus providing near real-time data. Within Morris County, continuous monitoring is conducted at Chester (Nitrogen Dioxide, Nitric Oxide, Ozone, Sulfur Dioxide and meteorological data) and .Morristown ( Carbon Monoxide and Smoke Shade). Many of the continuous site locations are also part of the Manual Monitoring Network.

The Manual Monitoring Network does not transmit data in near real-time as does the Continuous Monitoring Network. The manual network consists primarily of various

Table 12-1: USEPA National-scale		Air Toxics Assessment (NATA) For 1999—Results For Morris County	(NATA)	For 1999–	-Results Fo	r Morris (	County	
Pollutant	Modeled Air Concentration (ug/m3) <sup>1</sup>	Health Benchmark (ug/m3) <sup>2</sup>	Risk Ratio³	Major Sources <sup>4</sup>	Area Sources <sup>5</sup>	On-road Mobile Sources <sup>6</sup>	Nonroad Mobile Sources <sup>7</sup>	Nonroad Background Mobile Contribution <sup>8</sup>
Acetaldehyde	1	0.45	3	0.7%	4%	48%	10%	38%
Acrolein	60.0	0.020	4	0.04%	21%	%65	20%	%0
Arsenic Compounds	0.0000.0	0.00023	0.2	17%	83%	%0	%0	%0
Benzene	1	0.13	6	0.09%	5%	40%	18%	37%
Bis (2-ethylhexyl) phthalate	7	0.42	4	0.02%	0.004%	%0	%0	100%
1,3-Butadiene	0.1	0.033	3	0.002%	2%	31%	20%	48%
Cadmium Compounds	0.00003	0.00024	0.1	8%	92%	0%0	0.5%	%0
Carbon Tetrachloride	6.3	290.0	4	0.001%	0.2%	%0	%0	100%
Chloroform	80.0	0.043	1.8	4%	45%	%0	%0	51%
Chromium (hexavalent form) 0.00007	200000	0.000083	8.0	%9	82%	12%	0.7%	%0

Modeled Air Concentration—According to the 1999 NATA, this is the predicted level of this chemical in the air.

'Health Benchmark—Groups of experts at government agencies are brought together to look at all of the studies done on the health effects of a chemical, and to recommend toxicity values that can be used to evaluate public exposure to that chemical. These toxicity values are used as "health benchmarks"

Risk Ratio—Comparing a health benchmark to an air concentration gives a risk ratio. Risk ratios equal to or less than one (below the health benchmarks) are not expected to be harmful to human health.

'Major Point Source—A point source is a stationary facility or process that emits a significant amount of air pollution during operation (power plants, waste incinerators, etc.)

Area Source—Area sources are often too small or too numerous to be inventoried individually. They include some industrial processes, pesticide use, dry cleaners, etc. Onroad Mobile Sources—vehicles found on roads and highways, including cars, trucks, buses, and motorcycles.

Non-road mobile sources—include aircraft, trains, lawnmowers, boats, dirt bikes, construction vehicles, farm equipment, leaf blowers, etc.

\*Background Contribution—Some of the air toxics evaluated in NATA are no longer emitted in significant quantities, but levels in air persist from past emissions. They are attributable to long-range transport, unidentified emission sources, and natural emission sources

Table 12-1: USEPA National-scale Air Toxics Assessment (NATA) For 1999—Results For Morris County (continued)	al-scale Air Toxic	s Assessment (	(NATA)	For 1999-	—Results F	or Morris (	County (co	ontinued)
Pollutant	Modeled Air Concentration (ug/m3) <sup>1</sup>	Health Benchmark (ug/m3) <sup>2</sup>	Risk Ratio³	Major Sources <sup>4</sup>	Area Sources <sup>5</sup>	On-road mobile Sources <sup>6</sup>	Nonroad Mobile Sources <sup>7</sup>	Nonroad Background <sup>8</sup> Mobile Sources <sup>7</sup>
Diesel Particulate Matter	1	0.0033	442	%0	%0	46%	54%	6%0
Ethylene Dibromide	0.02	0.0017	15	%10.0	%2000	%0	%0	100%
Ethylene Dichloride	0.04	0.038	1	0.4%	%7.0	%0	%0	%66
Formaldehyde	1	0.077	61	%5.0	%7	%0£	%21	53%
Methyl Chloride	1	0.56	2	%200.0	%£'0	%0	%0	100%
Napthalene	0.04	0.029	1.5	%7.0	%59	%97	%8	0%0
Nickel Compounds	0.002	0.0064	6.0	2%	%L6	2%	0.2%	0%0
Perchloroethylene	0.2	0.17	1	60.0	%68	%0	%0	61%
1,1,2,2-Tetrachloroethane	90.0	0.017	3	0.05%	0.2%	%0	%0	100%

Modeled Air Concentration—According to the 1999 NATA, this is the predicted level of this chemical in the air.

'Health Benchmark—Groups of experts at government agencies are brought together to look at all of the studies done on the health effects of a chemical, and to recommend toxicity values that can be used to evaluate public exposure to that chemical. These toxicity values are used as "health benchmarks"

Risk Ratio—Comparing a health benchmark to an air concentration gives a risk ratio. Risk ratios equal to or less than one (below the health benchmarks) are not expected to be harmful to human health.

'Major Point Source—A point source is a stationary facility or process that emits a significant amount of air pollution during operation (power plants, waste incinerators, etc.) Area Source—Area sources are often too small or too numerous to be inventoried individually. They include some industrial processes, pesticide use, dry cleaners, etc. 'Onroad Mobile Sources-vehicles found on roads and highways, including cars, trucks, buses, and motorcycles.

<sup>7</sup>Non-road mobile sources—include aircraft, trains, lawnmowers, boats, dirt bikes, construction vehicles, farm equipment, leaf blowers, etc.

<sup>8</sup>Background Contribution—Some of the air toxics evaluated in NATA are no longer emitted in significant quantities, but levels in air persist from past emissions. They are

For diesel particulate matter, onroad and nonroad concentrations include a model-estimated background concentration attributable to long-range transport, unidentified emission sources, and natural emission sources.

instruments that collect samples for subsequent analysis in a laboratory. The network provides data on fine particulates (particles smaller than 2.5 micrometers in diameter or PM2.5), inhalable particulates (particles smaller than 10 micrometers in diameter or PM10), lead (Pb), Total Suspended Particulates (TSP), several parameters associated with atmospheric deposition, pollutants important in the formation of ground level ozone (ozone precursors), and a group of organic and inorganic compounds that are considered toxic pollutants. Like the Continuous Monitoring Network, not all parameters are measured at all sites.

Within Morris County there are Manual Monitoring and Continuous Monitoring sites in Morristown and Chester. Results of this monitoring are shown in Table 12-2. Of the substances listed for these locations only the levels for Sulfur Dioxide exceeded the standard.

The overall trend in New Jersey's air quality shows improvement. For example, Carbon Monoxide (CO) levels have improved dramatically over the past 20 years. The last time the CO standard was exceed in New Jersey was 1995. For Nitrogen Dioxide the standard was last exceeded in 1974. Ozone levels have also improved although this improvement has leveled off in recent years. Further Ozone reduction will have to be achieved over a very large region because levels in New Jersey are dependent on emissions from upwind sources. Sulfur Dioxide concentrations have improved significantly with the use of low sulfur fuels. The standard has not been exceeded since 1980.

Also monitored by NJDEP is atmospheric deposition. Atmospheric deposition, also known as "acid rain", refers to pollutants that are deposited on land or water from the air. Deposition is usually the result of pollutants being removed from the atmosphere and deposited by precipitation (wet deposition) or by the settling out of articulates (dry deposition). Dry deposition also includes gaseous pollutants that are absorbed by land or water bodies.

Figure 12-1 shows the basic mechanisms of deposition and the major pollutants of concern. These include sulfur dioxide (SO2), nitrogen oxides (NOX), mercury (Hg), and volatile organic compounds (VOCs). SO2 is a major contributor to acid deposition, which can reduce the ability of water bodies to support certain types of fish and other aquatic organisms. NOX also contributes to the acid deposition problem and can contribute to eutrophication of water bodies as well. Hg will accumulate in fish by a process know as biomagnification. Small concentrations of Hg in water are concentrated in smaller organisms. These smaller organisms are in turn consumed by larger ones. As the Hg moves up the food chain, it becomes more concentrated. Fish in Hg contaminated water can become contaminated to the point where they are no longer safe for people to eat. VOCs are a very diverse group of compounds, some of which are toxic, including known carcinogens.

Atmospheric deposition is the result of pollution from a wide variety of sources and in some cases the pollution can travel great distances before being deposited on the land or

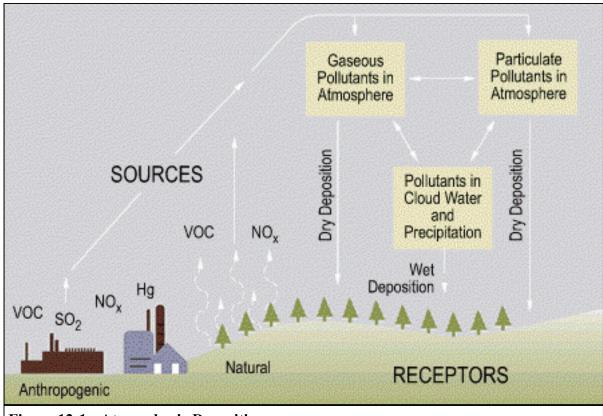


Figure 12-1: Atmospheric Deposition

(Source: NJDEP << http://www.state.nj.us/dep/airmon/dep05.pdf)

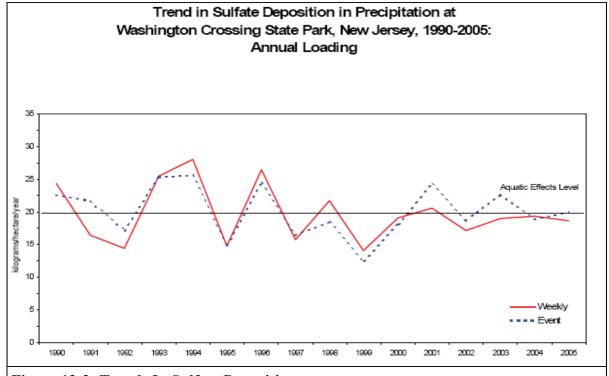
<b>Table 12-2</b>	Table 12-2: Air Quality Standards An	ards And Rea	adings For I	Manual and	l Continuou	ıs Monitorir	nd Readings For Manual and Continuous Monitoring Networks, 2005	2005	
Parameter	Standard	Site	Maximum 3-hour 1-Hr Averag Average Maxim (ppm) (ppm)	ium ium	Maximum 8-Hr Average (ppm)	24-hour Average Maximum (ppm)	24-hour Maximum (microgram s per cm)	12 month Average Maximum (ppm)	Annual Mean (microgram s per cm)
Carbon Monoxide	1-hour=35ppm 8-hour=9 ppm	Morristown	2.8		2.2				
Nitrogen Dioxide	1-hour=0.25 ppm 12-month=0.053 ppm	Chester	0.056					0.011	
Ozone	1-hour=0.12 ppm	Chester	0.100						
PM2.5	24-hour=65 micrograms per cm Annual=15 micrograms per cm	Chester					42.3		10.8
PM2.5	24-hour=65 micrograms per cm Annual=15 micrograms per cm	Morristown					43.4		12.3
Sulfur Dioxide	3-hour=0.50 ppm 24-hour=0.14 ppm 12-month =0.030 ppm	Chester		0.051		0.022		0.004	

water. Some known sources of atmospheric deposition are power plants, motor vehicles, incinerators, and certain industries.

The state monitors atmospheric deposition at 2 locations. Results show considerable acidity. When acidity is reported on the pH scale, neutral is considered a 7 with decreasing pH values corresponding to increasing acidity. Normal rainfall has a pH of approximately 5.6 due to the natural presence of carbonic acid in the air. The mean pH value recorded at the Washington Crossing State Park weekly sampler was 4.47 and the Ancora State Hospital sampler recorded a mean pH of 4.57.

Figure 12-2 shows the change in the amount of sulfate ion deposited over a 15 year period at the monitoring site in Washington Crossing State Park. The figure shows "wet deposition" only. It does not include dry particulate sulfate that was deposited when no precipitation was occurring. Therefore, the total deposition is higher than what is shown here. The factors controlling the trend are the sulfate concentrations in air and cloud droplets and the total amount of precipitation in a given year. For example, in 1991 and 1992, both the sulfate concentrations and the total precipitation were below normal, while they were high in 1993 and 1994. Since the values shown here are annual totals, they are also sensitive to loss of samples due to contamination or other factors.

Sulfate can alter soil and water chemistry, and a deposition level of 20 kilograms per hectare per year has been generally accepted as the limit above which damage to sensitive natural resources is likely to occur (i.e. Aquatic Effect Level). However, there are no national or New Jersey standards for sulfate deposition.



**Figure 12-2: Trends In Sulfate Deposition** (Source: NJDEP, 2001 Atmospheric Deposition Summary, <a href="http://www.state.nj.us/dep/airmon/depo01.pdf">http://www.state.nj.us/dep/airmon/depo01.pdf</a>)

## 13. Noise

Noise can be defined as unwanted sound, which unfortunately has become an unavoidable aspect of modern times. The increasing use of large construction equipment for minor jobs, cars and trucks for trips of any length, labor saving devices for homeowners such as mowers and blowers, gas powered equipment for leisure, sports and pleasure such as motorcycles, motorboats and jet-skis, commuter aircraft and so on has permitted a gradual acceptance of high noise levels as a natural by-product of progress. Noise is recognized as a pollutant, however, as it affects the health and well being of people and the enjoyment of property. Table 13.1 depicts the decibel levels that may be present during common everyday activities and the potential effects.

While most of Pequannock's residential neighborhoods are as quiet as any typical suburban town, Route 287 generates high decibel levels due to the amount of vehicular traffic at any given time according to the Bureau of Environmental Analysis, which detailed traffic noise abatement and construction noise mitigation procedures. Although there are other noise generators in the township, such as Route 23, the Newark-Pompton Turnpike, the Boulevard, and the Lincoln Park Airport, as well as other industrial and commercial facilities, no noise studies are available for these locations.

There are specialized instruments for measuring noise levels, although in many cases it is difficult to pinpoint the actual source of the offending noise. Both the federal and state government have established noise level standards to determine if a particular activity exceeds acceptable noise levels. It is important to understand that the potential for noise generation of a given development can limit the future land use in an area, and that economic consequences may result if this possibility is overlooked or ignored. Figure 13-1 lists common land uses and acceptable ambient sound levels.

The Township of Pequannock has in effect a Noise Ordinance set forth in the Codebook, Chapter 117. According to Pequannock's Noise Ordinance, "impulsive" sound (that is, a single peak or a single burst consisting of several peaks, that lasts less than one second) must be less than 80 decibels at the receptor location. Except as noted below, the A -weighted (averaged over longer duration) outdoor sound levels at the receptor location are limited to less than 65 decibels between the hours of 7:00 am and 10:00 pm, and to less than 50 decibels between the hours of 10:00 pm and 7:00 am. Specific restrictions also apply to certain audible frequencies. Special limitations apply to construction and demolition activities (which are prohibited between the hours of 6:00 pm and 7:00 am on weekdays, and 6:00 pm and 9:00 am on weekends and federal holidays), snow-removal equipment (motorized snow blowers and lawn equipment with attached snow plows must be operated with a muffler), exterior burglar alarms (termination of operation must occur within 5 minutes for continuous sound or 15 minutes for impulsive sound), amplified personal or vehicular music (cannot be plainly audible at a residential property line between the hours of 10:00 pm and 8:00 am, and cannot be plainly audible within 50 feet of the operator between the hours of 8:00 am and 10:00 pm).

**Table 13-1: Common Sounds, Noise Levels And Effects** (Source: National Institute on Deafness and Other Communication Disorders; <a href="http://www.nidcd.nih.gov/staticresources/health/education/teachers/CommonSounds.pdf">http://www.nidcd.nih.gov/staticresources/health/education/teachers/CommonSounds.pdf</a>)

Sound	Noise Level (decibels)	Effect
Jet Engine (near)	145	
Shotgun Firing	130	
Rock Concerts (varies)	110-140	Threshold of pain begins around 125 decibels
Thunderclap (near)	120	Threshold of sensation begins around 120 decibels
Chainsaw	110	
Leaf Blower	102	Regular exposures to sounds over 100 decibels for more than 1 minute can risk permanent hearing loss
Garbage truck/cement mixer	100	No more than 15 minutes of exposure recommended for sounds of 90-100 decibels
Farm tractor	98	
Subway, motorcycle (25 feet)	88	Very annoying
Lawnmower, food blender	85-90	85-90 decibels is the level where hearing damage can occur with exposure of 8 hours
Average city traffic	80	Annoying; interferes with conversation
Washing machine	78	
Vacuum cleaner, hair dryer	70	Intrusive; interferes with phone conversation
Normal conversation	50-65	
Quiet Office	50-60	Comfortable hearing levels are under 60 decibels
Refrigerator humming	40	
Whisper	30	Very quiet
Normal breathing	10	

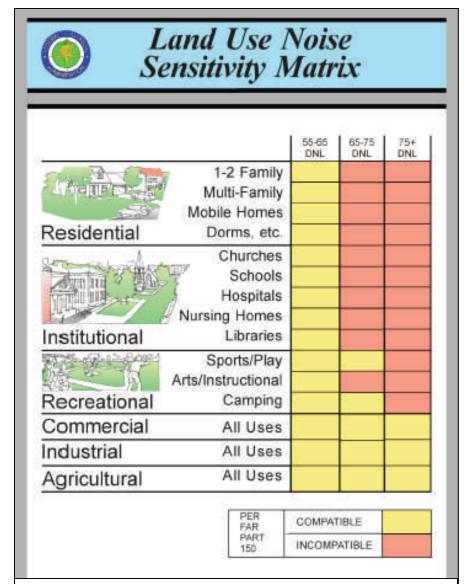


Figure 13-1: Land Use Noise Sensitivity Matrix

(Source: Federal Interagency Committee on Aviation Noise, Land Use Compatibility and Airports, http://www.fican.org/pdf/Land\_Use\_Planning\_and\_Airports.pdf)

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# 14. Areas of Special Concern

## 14-I. Open Space and Natural Areas

Although much of Pequannock is developed, there are still a few places where one can sense the way things were before the first settlers arrived. These places become increasingly valuable to the township, not only for aesthetic reasons, but also for flood control, air and water quality, recreation, and wildlife habitat. The larger natural areas remaining in the township are numbered 1 through 6 in Figure 14-2.

One exceptional tract is marked as area 1 in Figure 14-2. There, the abrupt rise in elevation that marks the edge of the Highlands Province affords wonderful views of the township, especially from Pequannock Knob. Down through the surrounding woods run Rockyledge Brook, and the headwaters of Sawmill Creek, mountain streams little changed by civilization, and several hiking trails. Most of this area is preserved within Mountainside Park, the largest park in the township. This park connects to even more expansive undeveloped tracts in Kinnelon, Montville and beyond, and forms the greatest expanse of contiguous forest in the Pequannock area. This land has now been given new protections under the Highlands Act.

In the southwestern portion of Pequannock, extensive forest and wetlands follow the course of Sawmill Creek, the East Ditch, and the West Ditch, shown as area 2 in Figure 14-

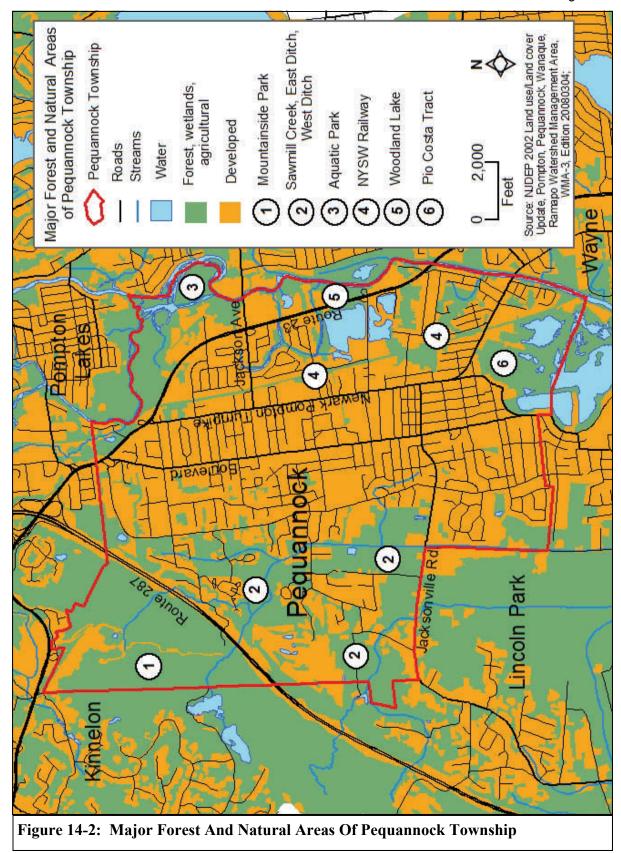
2. Like the Mountainside Park lands, this area forms part of a larger network of wetlands and woodlands extending beyond Pequannock's border into neighboring Kinnelon and Lincoln Park. As noted elsewhere in the discussion on wildlife, many of the regions rarest wildlife species inhabit wetlands, so this area is particularly important for wildlife. Small sections of this land have been preserved, but much of this area relies on the protection afforded by wetlands regulations. The East Ditch, is actually not a "natural" feature ,but was originally dug by the Bog and Vly Company as a drainage system to improve the farming in the surrounding wetlands. There is



Figure 14-1: Foothills Park

a path along the ditch through the woods which is within the open space component of the Glens development, and it connects to trails in Mountainside Park. The development was clustered in the wetlands where the Saw Mill Stream and the Rockyledge Brook join.

An extensive undeveloped corridor exists along the Pequannock and Pompton Rivers, shown as area 3 in Figure 14.2. Part of this area is owned by the Township in Aquatic Park, a peaceful place both for quiet contemplation and a canoe trip. Boaters can visit the park by traveling these rivers from launch sites in Pompton Lakes and Riverdale along the newly established Three Rivers Boating Trail.



In addition to the East Ditch, there are other aspects of Pequannock's current natural beauty that were manmade. The overgrown natural corridors created by the abandoned right-of-way of the New York Susquehanna and Western Railway (area 4 in Figure 14.2), and the extensive wetlands along it are an important natural resource for the township.

Another example is the lake, woodlands and wetlands in the privately owned Pio Costa tract, listed as area 5 in Figure 14.2. Connected to public park land in Lincoln Park, this site is an important stop-over for migrating birds as well as providing habitat for local wildlife.

Woodland Lake at Alexander Avenue and Route 23, is an additional important site, near the more densely populated center of town, and used for fishing and boating. At forty acres, it is the third largest park in the township (see Figure 14.3).

The right-of-way along the railroad connects Pequannock Valley Park and Woodland Lake with the commercial centers, and the Pio Costa tract with Aquatic Park. Although there is some speculation that the right-of-way will someday be incorporated into a regional mass transit system, for the foreseeable future the right-of-way will be part of any walking and biking trail system in the township, and it is mentioned in the Morris County bikeways plan of 1979.

Figure 14-4 depicts lands, including some of these locations, that are in public ownership.



Figure 14-3: Woodland Lake

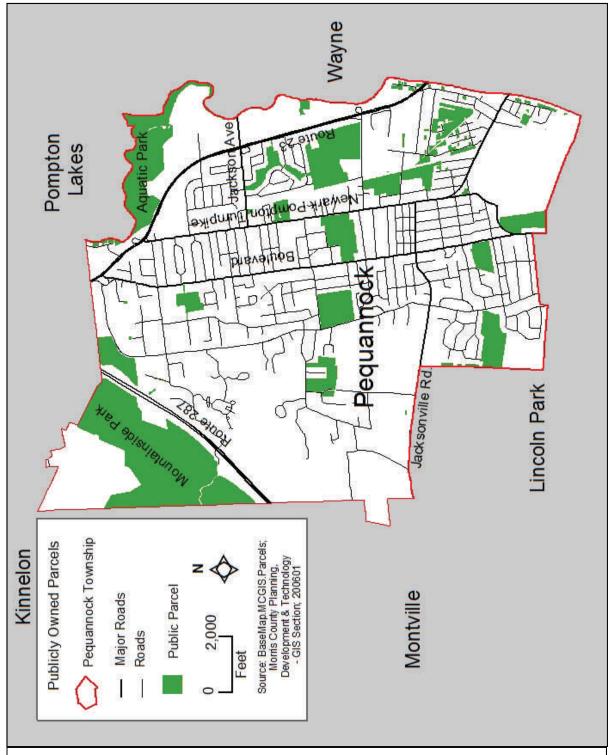
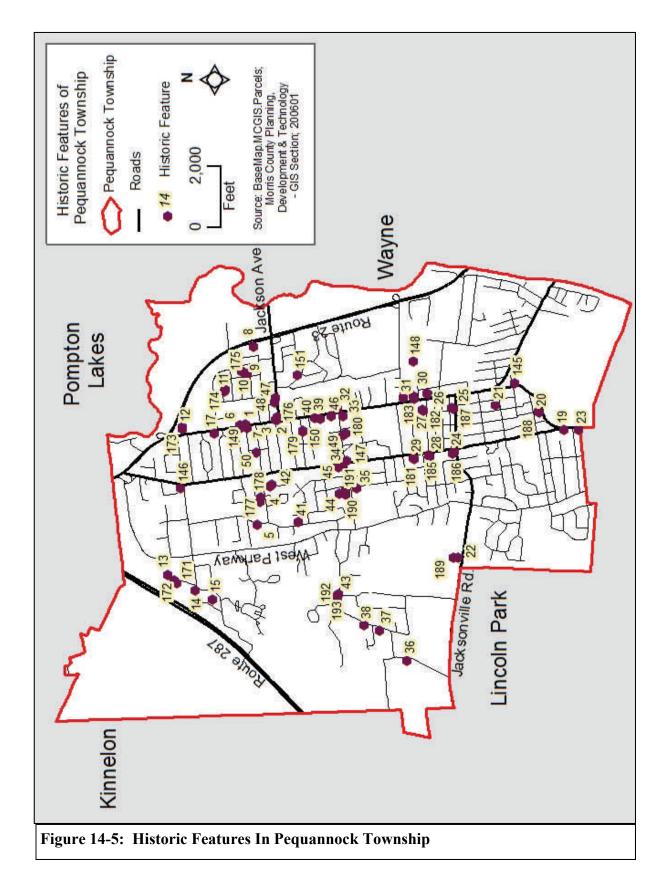


Figure 14-4: Public Lands Of Pequannock Township

#### 14-II. Historic Places

Not long ago historic preservation was considered a rich man's hobby, but today most planners realize the cultural, social, and environmental importance of historic preservation. In a town with as long and rich an history as Pequannock, historic structures are at their best in their original settings, including as much period landscaping as possible. When set apart as museum pieces or crowded into modern development plans, these buildings lose much of their appeal.

There are a number of structures in Pequannock that have been recognized for their architectural or historic significance. Table 14.1 is a list of historic structures and Figure 14.5 is a map depicting their locations within the township. More extensive descriptions are found in Appendix I, from the *Morris County Master Plan, Historic Preservation Element*. There are also excellent histories of Pequannock Township by George Parr and Elmer Salvini available in the Township library.



Historic Feature ID #	Historic Feature Name	Historic Feature Common Name
1		678 Turnpike
2	Berry's Corner	Jones' Store
3	Pompton Plains School No. 2	
4		76 Hopper Avenue
5	G. Van Ness House	
6	Paul Revere Hall	John H. Lookhoff American Legion Building
7	Thomas Mandeville House	
8	Martin Berry House	
9		10 Oping Road
10		12 Oping Road
11		35 Oping Road
12	Van Gelder-Van Saun House	
13	Paul Barney DeBow House	
14	Paul Debow House	
15	Henry DeBow House	
17		741 Turnpike
19	J. Sindle House	
20	H. Mandeville House	
21	A. Terhune House	
22		Grieves Farm
23	Nicholas Slingerland House	
24	Jacob Slingerland House	
25	The Osborn	
26		382 Turnpike
27	A. Mandeville House	
28		165 Boulevard
29	S. Slingerland House	
30	Henry Van Ness House	

Table 14-1: Historic Features In Pequannock (continued)

Historic Feature ID #	Historic Feature Name	Historic Feature Common Name
149		701 Turnpike
150		11 Franklin Street
151		11 Brookside Road
171		
172		
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Table 14-1: His	Cable 14-1: Historic Features In Pequannock (continued)				
Historic	Historic Feature Name	Historic Feature Common Name			
31		420 Turnpike			
32	Dutch Reformed Manse				
33		505 Turnpike			
34		243 Boulevard			
35		51 Washburn Road			
36	G. M. Van Ness House				
37	P. J. Slingerland House				
38	J. Beach House				
39	Reformed Netherlands Dutch Church				
40	Grace Chapel of First Reformed Church				
41		52 West End Avenue			
42	Peter Hopper House				
43	Jess Van Ness House				
44	Samuel or Peter Roome House				
45		249 Boulevard			
46	Reformed Netherlands Dutch Church				
47		41 Jackson Avenue			
48	Pompton Plains Train Station	Pequannock Railroad Station			
49		17 Sunset Road			
50	FHA House	30 Hopper Avenue			
145	Pequannock School	Boys and Girls Club			
146		60 Mountain Avenue			
147		35 Sunset Road			
148		101 Alexander Avenue			
149		701 Turnpike			

#### 14-III. Contaminated Sites

In Pequannock there are 21 sites that are known to be contaminated. These sites are described in Table 14.2. This data is taken from a NJDEP publication, *Known Contaminated Sites in New Jersey*. This document, which is updated annually, provides a listing of sites in every municipality in the state where contamination of soil or groundwater is confirmed. Those listed as Active have already been assigned to a NJDEP bureau for remediation. Those listed as Pending are awaiting the execution of an oversight document or the availability of resources prior to assignment to a remedial bureau.

A map showing some of these contaminated sites is provided in Figure 14.6. This mapping data was last updated in 2005 and does not show all sites listed in Table 14.2 for 2008.

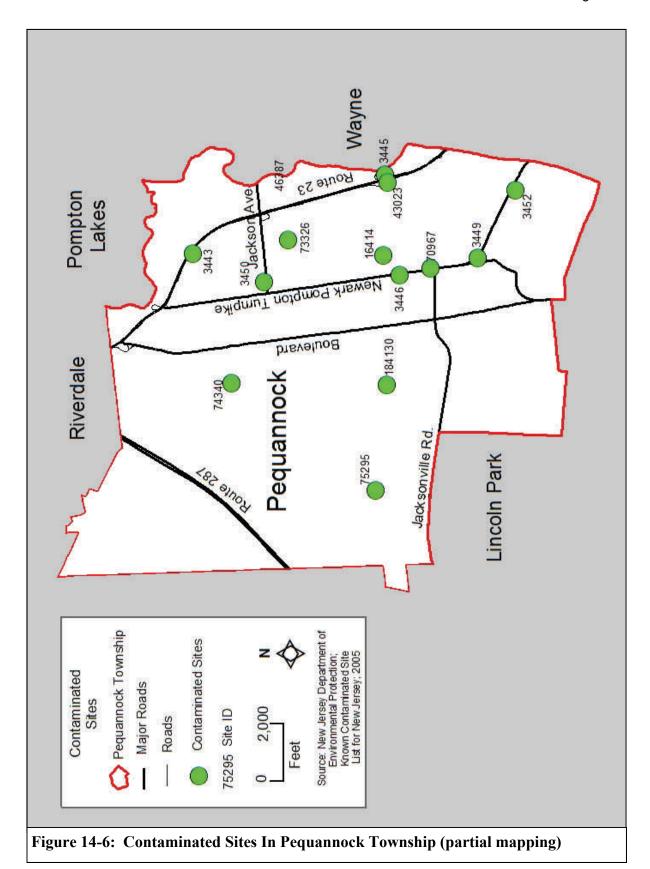


Table 14-2: Known Contaminated Sites In Pequannock for 2008					
Site ID	PI Number	Name	Address	Status	
74340	G000038692	120 West End Ave	120 W End Ave	Active	
225467	294280	16 Village Road	16 Village Rd	Active	
73326	G000033530	23 Brookside Avenue	23 Brookside Ave	Active	
352714	435329	26 Village Road	26 Village Rd	Active	
75295	G000043330	3 Barnard Place	3 Barnard PI	Active	
356166	439740	4 Copley Court	4 Copley Ct	Active	
222105	290063	51 Fourth Street	51 4th St	Active	
205110	269751	5 Van Allen Place	5 Van Allen Pl	Active	
183356	239877	5 Winding Way	5 Winding Way	Active	
205240	269928	71 Greenwood Avenue	71 Greenwood Ave	Active	
184139	240857	91 West Parkway	91 West Pkwy	Active	
3446	007288	Citgo Service Station	403 Newark Pompton Tpke	Active	
3445	009119	Hess Station 30512	200 Rt 23	Active	
375741	465685	Kick Project	4 Copley Ct	Active	
3443	009281	Lukoil 74079	729 Rt 23	Active	
3452	009278	Mobil 57357	41 Newark Pompton Tpke	Active	
3449	016620	Pequannock Pyramid	242 Newark Pompton Tpke	Active	
16414	009035	Pequannock Twp	99 Alexander Ave	Active	
70967	G000003641	Pio Costa Enterprises Landfill	Newark Pompton Tpke	Active	
3450	019357	Pompton Plains Service	19 Jackson Ave	Active	
43023	004433	Rentals Unlimited	191 Rt 23	Active	
26150	009198	Brothers Mercedes Serv and Repair	704 Newark Pompton Tpke	Pending	
66398	G000005167	Eastern Chemicals Incorporated	8 Industrial Rd	Pending	
20082	02062	Lakeland Automotive Inc	730 Rt 23	Pending	

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# 15. Relationship To Other Plans

### 15-I. State Development and Redevelopment Plan

Since the early 1990's, Pequannock has participated in the creation of the State Development and Redevelopment Plan (SDRP). The purpose of the SDRP as stated within it, is to "Coordinate planning activities and create statewide planning objectives in the following areas: land use, housing, economic development, transportation, natural resource conservation, agricultural and farmland retention, recreation, urban and suburban development, historic preservation, public facilities and services, and intergovernmental coordination."

As part of this process lands are designated as specific types, called "planning areas" that are grouped by common development and environmental features. The majority of Pequannock Township is designated in the SDRP's Planning Area 1 or "Metropolitan" Area. A Metropolitan Area is intended to "Provide for much of the state's future redevelopment; revitalize cities and towns; promote growth in compact forms; stabilize older suburbs; redesign areas of sprawl; and protect the character of existing stable communities."

Next in size is Planning Area 3, known as the "Fringe" Area. According to the SDRP, these lands are intended to serve primarily as a buffer between more developed metropolitan and suburban areas and less developed rural and environmentally sensitive lands.

Planning Area 5, the "Environmentally Sensitive" Area is meant to protect environmental resources, such as wetlands or forests through the protection of large contiguous areas of land. It should be noted that this designation is not precise. For example, many wetland areas in Pequannock Township are not designated in Planning Area 5.

Smaller tracts, less than one square mile in extent, that are considered environmentally sensitive are designated in the SDRP as "Critical Environmental Sites". During the cross-acceptance process, a number of these areas were designated in Pequannock Township. These lands are depicted in Figure 15-1. They include steep slopes, aquifer recharge areas near the township's wells, wetlands, parks, the floodways of the Pequannock and Pompton Rivers, and the floodplains adjacent to the East and West Ditches. According to the SDRP, their presence "...gives land owners and developers important advance information on how to shape their proposals for development of the land around them, focusing on including them within the design and function of the development whenever possible, while at the same time protecting them from adverse impacts."

Planning Area 6 includes parks and other publicly dedicated lands that were identified in the cross-acceptance process. Again, there mat be lands meeting this criteria that were not mapped into these area.

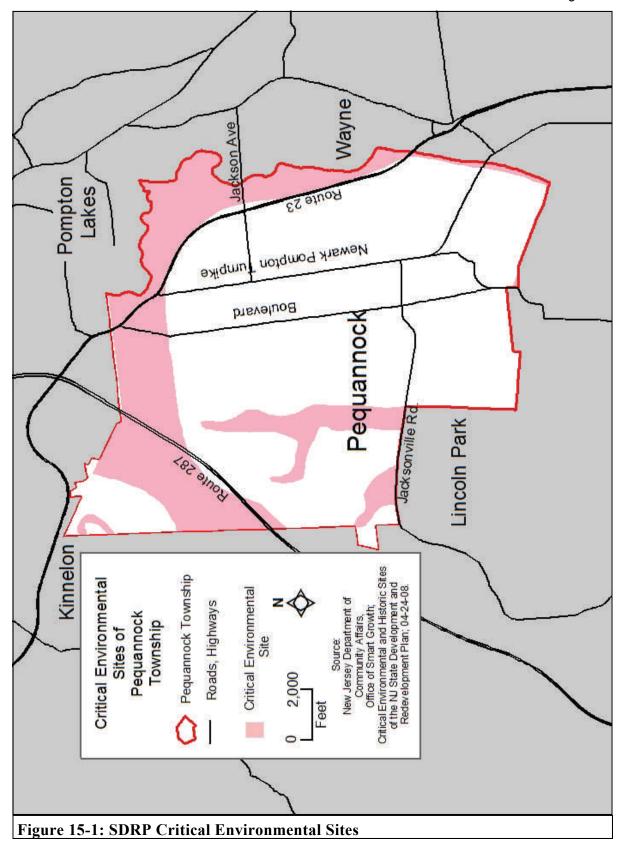
Within these different planning areas, the SDRP also designates "Centers". The SDRP defines Centers as "...compact forms of development that, compared to sprawl development, consume less land, deplete fewer natural resources and are more efficient in the delivery of

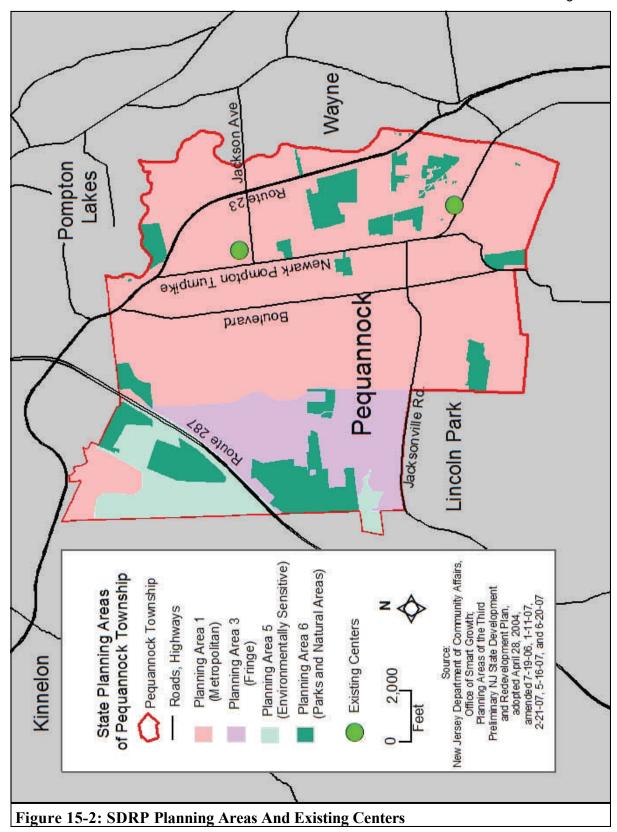
public services. The concept of Centers is the key organizing principle for development and redevelopment in the state."

According to the SDRP, "A key target of the State Plan is to promote and accommodate growth in these Centers, rather than continuing to sprawl across our remaining farmlands and open spaces. Centers are complex, richly textured living communities, where a physical framework of buildings, infrastructure and open spaces actively supports the economy and civil society. Traditional compact communities have evolved (and continue to evolve) over long periods of time, demonstrating a frequently overlooked capacity for adapting to changing, and sometimes adverse circumstances. As Centers are planned to be the location for much of the growth in New Jersey, it is critical that they be located and designed with the capacity to accommodate desired growth. Promoting redevelopment, in particular, is the key strategy for promoting and accommodating growth in New Jersey."

The commercial districts of Pequannock and Pompton Plains along the Newark-Pompton Turnpike were designated as existing centers.

Figure 15-2 shows the mapping of the designated areas from the most recent version of the 2001 SDRP, as well as the location of the existing centers.





## 15-II. The Highlands Water Protection and Planning Act

A new and important facet in land use planning and protection of natural resources in Pequannock is the Highlands Water Protection and Planning Act, adopted by the State of New Jersey in 2004.

In framing this Act the legislature declared that the "...New Jersey Highlands is an essential source of drinking water, providing clean and plentiful drinking water for one-half of the State's population, including communities beyond the New Jersey Highlands, from only 13 percent of the State's land area; that the New Jersey Highlands contains other exceptional natural resources such as clean air, contiguous forest lands, wetlands, pristine watersheds, and habitat for fauna and flora, includes many sites of historic significance, and provides abundant recreational opportunities for the citizens of the State."

The Act created a 15-member Highlands Council, charged with implementation of the Act and with creation of a Regional Master Plan for this area. To safeguard these resources the Act divided the entire New Jersey Highlands region into two areas—the Preservation Area and the Planning Area (see Figures 15-3 and 15-4). Within the Preservation Area the stated goals of the Act are:

- 1. protect, restore, and enhance the quality and quantity of surface and ground waters therein;
- 2. preserve extensive and, to the maximum extent possible, contiguous areas of land in its natural state, thereby ensuring the continuation of a Highlands environment which contains the unique and significant natural, scenic, and other resources representative of the Highlands Region;
- 3. protect the natural, scenic, and other resources of the Highlands Region, including but not limited to contiguous forests, wetlands, vegetated stream corridors, steep slopes, and critical habitat for fauna and flora;
  - 4. preserve farmland and historic sites and other historic resources;
- 5. preserve outdoor recreation opportunities, including hunting and fishing, on publicly owned land;
  - 6. promote conservation of water resources;
  - 7. promote brownfield remediation and redevelopment;
- 8. promote compatible agricultural, horticultural, recreational, and cultural uses and opportunities within the framework of protecting the Highlands environment; and
- 9. prohibit or limit to the maximum extent possible construction or development which is incompatible with preservation of this unique area.

In the Planning Area the stated goals are:

1. protect, restore, and enhance the quality and quantity of surface and ground waters

therein:

- 2. preserve to the maximum extent possible any environmentally sensitive lands and other lands needed for recreation and conservation purposes;
  - 3. protect and maintain the essential character of the Highlands environment;
  - 4. preserve farmland and historic sites and other historic resources;
- 5. promote the continuation and expansion of agricultural, horticultural, recreational, and cultural uses and opportunities;
- 1.preserve outdoor recreation opportunities, including hunting and fishing, on publicly owned land;
  - 2.promote conservation of water resources;
  - 3.promote brownfield remediation and redevelopment;

4.encourage, consistent with the State Development and Redevelopment Plan and smart growth strategies and principles, appropriate patterns of compatible residential, commercial, and industrial development, redevelopment, and economic growth, in or adjacent to areas already utilized for such purposes, and discourage piecemeal, scattered, and inappropriate development, in order to accommodate local and regional growth and economic development in an orderly way while protecting the Highlands environment from the individual and cumulative adverse impacts thereof;

5.promote a sound, balanced transportation system that is consistent with smart growth strategies and principles and which preserves mobility in the Highlands Region.

To implement these goals the Highlands Council created a Highlands Regional Master Plan (RMP). Like a typical Master Plan, the RMP separates the Highlands Region into different zones based on the underlying characteristics of the land and specifies what land uses and land use intensities can occur in these different zones. These include 3 major zones (the Protection Zone, the Conservation Zone, and the Existing Community Zone) and two sub-zones (the Lake Community Zone, and the Environmentally-Constrained Sub-Zone). The zones and subzones are illustrated in Figure 15-5.

The Protection Zone includes lands within the Highlands Region which contain the highest quality resource value lands, which are essential to maintaining and enhancing water quality and quantity and preserving ecological function. The Protection Zone includes regionally significant lands that serve to protect environmentally sensitive resources of the Highlands Region.

The Conservation Zone includes lands of significant agricultural importance and associated natural resource lands that are adjacent to, or in common ownership with, land used for agricultural purposes. Development potential in the Conservation Zone is limited in location and intensity because of agricultural and natural resource protection requirements and infrastructure constraints.

The Existing Community Zone includes those areas characterized by existing

development with comparatively fewer natural resource constraints than the Protection and Conservation Zones; they often are currently or more easily served with public infrastructure. The Existing Community Zone includes previously developed lands of regional significance in size, geography and infrastructure that may include areas of opportunity for future growth and development, including development and redevelopment which may involve the use of Highlands Development Credits (HDC), provided that such growth and development are consistent and compatible with existing community character, natural resource constraints and is desired by the municipality.

Within the Conservation Zone, the Environmentally Constrained Sub-Zone consists of significant environmental features that should be preserved and protected from non-agricultural development. Development activities will be limited and subject to stringent limitations on consumptive and depletive water use, degradation of water quality, and impacts to environmentally sensitive lands.

Within the Existing Community Zone, the Environmentally Constrained Sub-Zone consists of significant contiguous Critical Habitat, steep slopes and forested lands that should be protected form further fragmentation. They serve as regional habitat "stepping stones" to larger contiguous Critical Habitat and forested areas. As such, they are not appropriate for significant development, and are best served by land preservation and protection. Development is subject to stringent limitations on consumptive and depletive water use, degradation of water quality, and impacts to environmentally sensitive lands.

The Lake Community Sub-Zone consists of patterns of community development that are within the Existing Community Zone and within 1,000 feet of lakes. The Highlands Council focused on lakes that are 10 acres or greater and delineated lake management areas consisting of an area of up to 1,000 feet (depending on the protection focus) from the lake shoreline in order to protect water quality, resource features, shoreline development recreation, scenic quality and community character. A future management area is planned, encompassing the full lake watershed, for protection of the lake water quality. This zone has unique policies to prevent degradation of water quality, and watershed pollution, harm to lake ecosystems, and promote natural aesthetic values within the Existing Community Zone.

An extensive set of policies are based on these areas and zones. These are fully described in the RMP.

In addition, the New Jersey Department of Environmental Protection adopted a series of new regulations to preserve Highlands' resources.

These policies and regulations are only mandatory for the Highlands Preservation area. As shown in Figure 15.4, the majority of Pequannock Township is within the Planning Area except for a small area northwest of Route 287. Within the Preservation Area, Pequannock must conform its zoning to agree with the Highlands Regional Master Plan. In the Planning Area, Pequannock has a choice on conformance or what is known as "opting in" to the Plan.

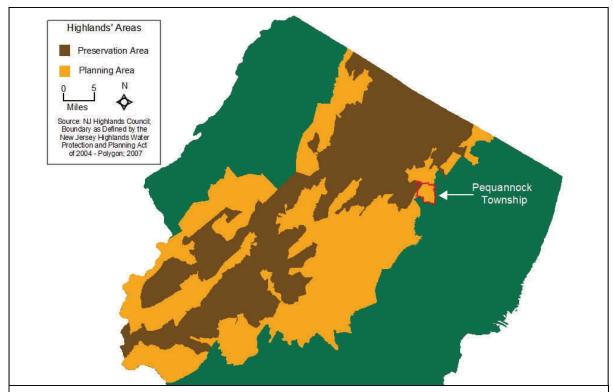
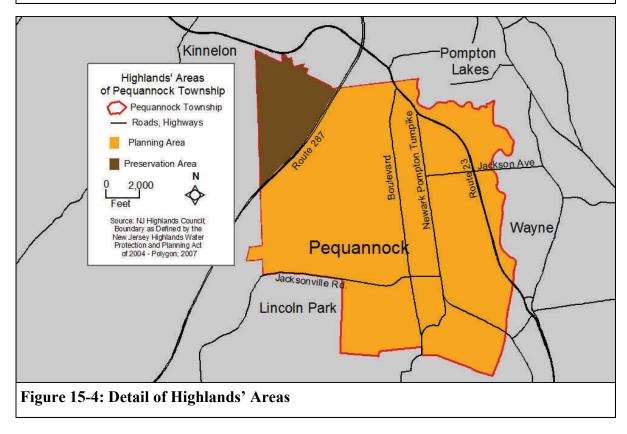
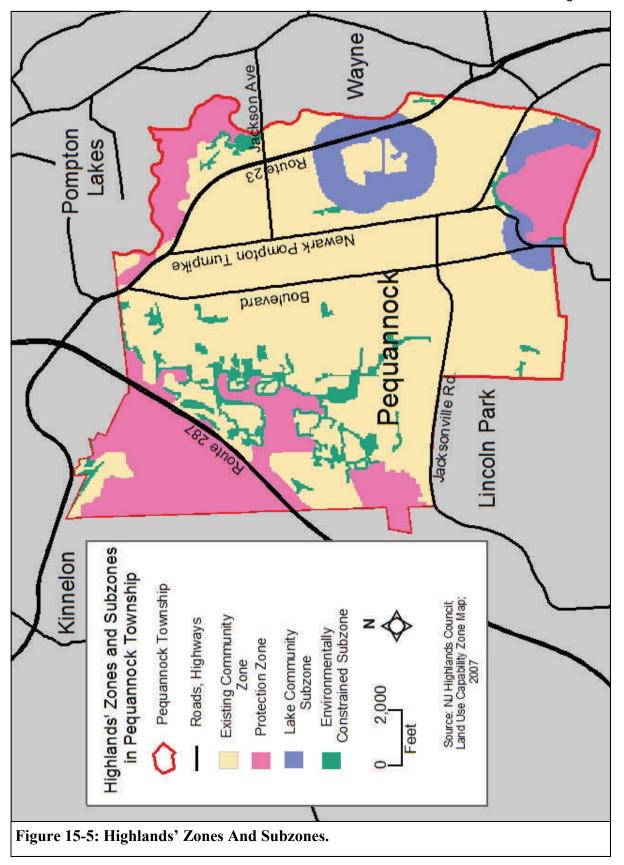


Figure 15-3: Highlands' Areas From The Highlands Water Protection And Planning Act





### 15-III. Pequannock Township Master Plan

As described in its introduction, the Township of Pequannock Master Plan "...examines the community's existing conditions and establishes goals and objectives as well as sets forth plans relating to land use, housing and other aspects or elements of the community." In providing a framework for land use, the Master Plan also offers guidance toward preserving and protecting environmental resources.

The first Master Plan was created in 1950 and has been revised periodically since then. The most recent update was a Reexamination Report adopted in November of 2003 that listed the 49 goals, objectives and planning problems from the prior Master Plan and offered a status on each. Among them were many items directed toward environmental protection such as "Protect the views of the mountains by locating development in areas on or around the mountains so as not to disturb these views" or "Preserve all lakes and wetlands." As noted, the report also provides the current status of these objectives and information on how the Township is pursuing these goals.

The municipal code for Pequannock Township is intended to promote the goals and objectives of the Master Plan through land zoning and other regulations. For example, there are requirements concerning environmental impact statements, air pollution and flood damage prevention. At present Pequannock Township does not have ordinances controlling tree removal or disturbance of steep slopes.

#### 16. Recommendations

First, the Township of Pequannock should continue to update this ERI periodically, as new information and new technologies become available.

Regarding the Township groundwater supply, measures to reduce the source or sources of sodium contamination should be explored. This may require additional research, and coordination between state, county, municipal and private entities.

Although this ERI provides valuable information on the natural resources of various sites, the work of Township officials involved in land use regulation would be aided by an ordinance requiring an Environmental Impact Statement (EIS) when new development is proposed. A sample EIS from the Borough of Far Hills is attached as Appendix G. This EIS offers a sliding scale of requirements based on the extent of the development proposed.

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#### **Documentation**

# **General Location and Description**

1994 Master Plan Draft. Pequannock Planning Board.

### A Brief History of Pequannock Township

<u>Historic Pequannock Township.</u> Emil R. Salvini, Wheal Grace Corporation Historical Publications, Lyndhurst, N.J., 1987.

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<u>History of Pequannock Township.</u> George C. Parr, Pequannock Township Board of Education Printing Department, 1990.

<u>Historic Pequannock Township.</u> Emil R. Salvini. Wheal Grace Corporation Historical Publications. Lyndhurst, NJ. 1987.

<u>Cedar Crest Village Retirement Community</u>, Birdsall Services Group; <a href="http://www.birdsall.com/projects/16/Cedar+Crest+Village+Retirement+Community">http://www.birdsall.com/projects/16/Cedar+Crest+Village+Retirement+Community</a>, 2007

# **Existing Land Uses**

1994 Master Plan Draft. Pequannock Planning Board.

<u>Morris County 2000 Census Profiles.</u> <<ha>http://www.co.morris.nj.us/generalHTML/demographics.asp. Morris County Board of Chosen Freeholders. 2005.

#### **State Development and Redevelopment Plan**

<u>The New Jersey State Development and Re-development Plan - Communities of Place.</u> New Jersey State Planning Commission, 1991.

New Jersey State Development and Redevelopment Plan. <a href="http://www.nj.gov/dca/osg/plan/stateplan.shtml">http://www.nj.gov/dca/osg/plan/stateplan.shtml</a>; New Jersey State Planning Commission. 2006.

#### The Highlands Water Protection and Planning Act

Highlands Regional Master Plan. <<a href="http://www.highlands.state.nj.us/njhighlands/master/rmp/final/highlands\_regional\_master\_plan\_september\_5\_2008\_for\_web.pdf">http://www.highlands.state.nj.us/njhighlands/master/rmp/final/highlands\_regional\_master\_plan\_september\_5\_2008\_for\_web.pdf</a>. New Jersey Highlands Council. 2008.

### **Topography**

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**Open Space** 

**Historic Places** 

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# Appendix A: Managing Highway Deicing to Prevent Contamination of Drinking Water



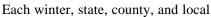
# Source Water Protection Practices Bulletin

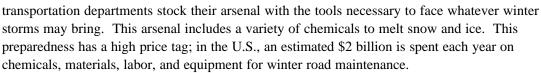
# Managing Highway Deicing to Prevent Contamination of Drinking Water

We depend on clear roads and highways for safe travel and the continual flow of goods and services. Deicing chemicals are used to clear roads covered by snow and ice during winter

weather. The runoff associated with highway deicing may contain various chemicals and sediment which have the potential to enter surface and ground water sources. This bulletin focuses on the management of highway deicing chemicals. See the bulletin on storm water runoff for additional management measures.







The most commonly used and economical deicer is sodium chloride, better known as salt;15 million tons of deicing salt are used in the U.S. each year. Salt is effective because it lowers the freezing point of water, preventing ice and snow from bonding to the pavement and allowing easy removal by plows. However, the use of salt is not without problems. Salt contributes to the corrosion of vehicles and infrastructure, and can damage water bodies, ground water, and roadside vegetation. These issues have led to the investigation and use of other chemicals as substitutes for and supplements to salt. Other deicing chemicals include magnesium chloride, potassium acetate, calcium chloride, calcium magnesium acetate, and potassium chloride (these are described below).

Abrasives such as sand are often used in conjunction with deicing chemicals to provide traction for vehicles, particularly on corners, intersections, and steep grades. However, when sand is overused, it often ends up in the environment, either as dust particles that contribute to air pollution or in runoff to streams and rivers.



## WHY IS IT IMPORTANT TO MANAGE HIGHWAY DEICING NEAR THE SOURCES OF YOUR DRINKING WATER?

Salt and other deicing chemicals can concentrate in runoff, which enters surface water or percolates through soil to reach ground water sources. It is difficult to generalize and quantify a deicer's effect on water bodies on a national level due to the complexity of stream environments and lack of detailed data. Furthermore, runoff is often diluted once it enters larger bodies of water, though it may affect smaller streams and creeks along highways. Generally, reservoirs and other drinking water supplies near treated highways and salt storage sites are susceptible to contamination, therefore special consideration and best management practices (BMPs) are needed to protect them.

Sodium is associated with general human health concerns. It can contribute to or affect cardiovascular, kidney, and liver diseases, and has a direct link to high blood pressure. Elevated sodium levels in sources of drinking water could prove dangerous, and dietary intake of sodium should be restricted. There is no MCL or health advisory level for sodium; however, there is a Drinking Water Equivalent Level of 20 mg/L, a non-enforceable guidance level considered protective against non-carcinogenic adverse health effects. Sodium is one of the contaminants EPA is considering for a regulatory determination.

Chloride, for which EPA has established a national secondary drinking water standard of 250 mg/L, adds a salty taste to water and corrodes pipes. The water quality standard for chloride is 230 mg/L, based on toxicity to aquatic life.

Anti-caking agents are often added to salt, the most common of which is sodium ferrocyanide. There is no evidence of toxicity in humans from sodium ferrocyanide, even at levels higher than those employed for deicing. However, some studies have found that the resulting release of cyanide ions is toxic to fish.

#### AVAILABLE PREVENTION MEASURES TO ADDRESS HIGHWAY DEICING

This section provides an overview of several management measures. The reference materials below can provide additional resources and information. Please keep in mind that individual prevention measures may or may not be adequate to prevent contamination of source waters. Most likely, individual measures should be combined in an overall prevention approach that considers the nature of the potential source of contamination, the purpose, cost, operational, and maintenance requirements of the measures, the vulnerability of the source water, the public's acceptance of the measures, and the community's desired degree of risk reduction.

The goal of these prevention measures is to minimize the loss of deicing chemicals due to overuse and mishandling. Management of deicing chemicals focuses on reducing waste through training and access to information on road conditions through the use of technology. Generally, optimal strategies for keeping roads clear of ice and snow will depend on local climatic, site, and traffic conditions, and should be tailored as such. Road maintenance workers should be trained on these measures prior to the winter season. Personnel should also be made aware of areas where careful management of deicing chemicals is particularly important, e.g., sensitive water areas such as lakes, ponds, and rivers. Similarly, personnel should be aware of runoff concerns from roadways that are near surface water bodies or that drain to either surface water or the subsurface (e.g., through a dry well).

Alternative deicing chemicals include calcium chloride and calcium magnesium acetate (CMA). Another alternative, sodium ferrocyanate, should be avoided due to its toxicity to fish. Although alternatives are usually more expensive than salt, their use may be warranted in some circumstances, such as near habitats of endangered or threatened species or in areas with elevated levels of sodium in the drinking water. Sensitive areas and ecosystems along highways should be mapped, and the use of deicing



Anti-icing chemical application.

alternatives should be targeted to those spots. Other considerations for using alternatives to salt include traffic volume and extreme weather conditions.

Each deicer works differently in various climatic and regional circumstances. For example, salt is most effective at temperatures above 20° F. As an alternative, calcium chloride is effective for temperatures that dip below 0° F and is fast acting, making it ideal for several areas of the country. In New England, it is used as an alternative on roadways in areas with high sodium concentrations in water. However, its high cost limits its use to these severe conditions. CMA has had limited use on roadways because of its high cost and the fact that it is only effective above 23° F; however, research shows few negative impacts on human health and the environment. Combining deicers, such as mixing calcium chloride and salt, can be cost-effective and safe if good information on weather conditions and road usage are available.

Road Weather Information Systems (RWIS) help maintenance centers determine current



RWIS Unit.

weather conditions in a given location. Since the mid-1980's, increasing numbers of states are using this technology. Sensors collect data on air and pavement temperatures, levels of precipitation, and the amount of deicing chemicals on the pavement. The data are paired with weather forecast information to predict pavement temperatures for a specific area and determine the amount of chemicals needed in the changing conditions. The strategically placed stations are 90 to 95 percent accurate. This information is also used for anticing treatment (described below) to allow for chemicals to be applied before the pavement freezes, reducing the amount of deicing chemicals used. Several states are developing satellite delivery of this information to maintenance workers.

Anti-icing or pretreatment methods are increasingly being used as a preventative tool. Anti-icing may require up to 90 percent less product than is needed for deicing after snow and ice have settled on road surfaces. Deicing chemicals, often liquid magnesium chloride, are applied to the pavement before

precipitation or at the start of a storm to lower the freezing point of water. Magnesium chloride is effective in extreme cold temperatures (as low as -13° F) and is cost effective as well. Timing is everything in the process, and weather reports or RWIS data can assist highway departments in determining the best time and place to apply chemicals. Anti-icing programs can avoid over-application of deicing chemicals after a storm event because less ice and snow bonds to the road. Several states reported improvements in traffic mobility and traction after using anti-icing treatment techniques. The Pacific Northwest Snowfighters (PNS) Association evaluates the safety, environmental preservation, and performance of winter road maintenance

products, including road deicers and anti-icers. PNS maintains, monitors, and updates a list of approved products on its web site (see the section on additional information below).

Some states have installed fixed chemical spraying systems in highway trouble spots, such as on curves and bridges, to prevent slippery roads. Chemicals are dispensed through spray nozzles embedded in the pavement, curbs, barriers, or bridge decks. Using pavement temperature and precipitation sensors, maintenance workers can monitor conditions and activate these fixed maintenance systems. This technique saves materials and manpower and reduces deicing operations during a storm. Though expensive to implement, these systems can be beneficial for areas such as bridges that cross sensitive water bodies, because the risk of over-application is reduced through the systems' efficiency.

*Spreading rates and the amount* of deicer used are important considerations. Some studies have shown that snow melts faster when salt is applied in narrow strips. In a technique known as windrowing, spreading is concentrated in a four to eight foot strip along the centerline to melt snow to expose the pavement, which in turn warms a greater portion of the road surface, and



causes more melting. This technique can be used on lesser traveled roads. The amount used is important, since too much deicer can be ineffective, as chemicals will be dispersed (i.e., to the side of the road) where they cannot melt snow and ice. If not enough deicer is used, the chemical interaction with ice needed for melting will not occur, wasting the application. Here is where knowledge of the specific conditions of precipitation and the pavement is needed. For example, shaded areas have lower

pavement temperatures and ice forms easier; therefore, more chemicals may be needed in these spots. As a general rule, less chemicals should be used when the temperatures are rising, and more should be used when they are falling.

**Timing of application** is an important consideration, as the strategy of anti-icing indicates. It takes time for the chemical reactions of salt and other deicers to become effective, after which a plow can more easily remove the snow. Sand should not be applied to roadways if more snow or ice is expected, as it will no longer be effective once covered. Traffic volume should also be taken into consideration, as vehicles can disperse deicers and sand to the side of the road. The timing of a second application is dictated by the road conditions. For example, while the snow is slushy on the pavement, the salt or deicer is still effective. Once it stiffens, however, plowing should be done to remove excess snow.

Application equipment aids in the proper distribution of deicer chemicals. Many trucks are equipped with a spinning circular plate that throws the chemicals in a semi-circle onto the road. A chute is used to distribute in a windrow, typically near the centerline of the road. Modified spreaders prevent the over-application of materials by calibration or by the speed of the truck and should be used. Spreader calibration controls the amount of chemicals applied and allows different chemicals to be distributed at different rates. Equipment can also be used to vary the width of the deiced area. General equipment maintenance and checks should be conducted at least once a year to ensure proper and accurate operation.

**Plowing and snow removal** are chemical-free options to keep roads clear of snow and ice. With plowing, less chemicals are needed to melt the remaining snow and ice pack. For specific weather conditions, specialized snow plows may be used. For example, various materials, such as polymers and rubber, can be used on the blade.

**Pre-wetting** of sand or deicing chemicals such as salt is a widespread practice. The resulting brine mixture can provide faster melting. Salt can be pre-wetted through a spray as it leaves the spreader. Sand is often pre-wet with liquid deicing chemicals just prior to spreading. This is an

effective method for embedding the sand into the ice and snow on the pavement. This technique can pay for itself through the savings in materials because less sand or salt bounces off the pavement and is lost.

**Street sweeping** during or soon after the spring snow melt can prevent excess sand and deicing residue from entering surface and ground waters. Many road departments sweep streets at least once in the spring, with either a broom sweeping or vacuuming vehicle. The sweepings can be added to sand piles for future reuse.

**Proper salt storage** is a key measure to prevent the introduction of potentially harmful contaminant loads to nearby surface and ground waters. It is important to shelter salt piles from moisture and wind, as unprotected piles can contribute large doses of sodium chloride to runoff. Salt should be stored inside a covered, waterproof structure, such as a dome or shed. Soil type, hydrology, and topography must also be appropriate for the storage area. Any runoff should be cleaned up immediately and the collected brine reused. Spills during loading and unloading should be cleaned as soon as possible. Salt storage sites should also be located outside of wellhead and source water protection areas, away from private wells, sole source aquifers (where feasible), and public water supply intakes. These areas should be identified so application in these areas can be controlled and storage precautions enforced.

*Ground water quality monitoring* near salt storage and application sites should be performed, at minumum, annually. Site-specific water table maps that show the direction of groundwater flow should be reviewed, and monitoring performed up gradient and down gradient of storage and application sites to detect contamination.

#### FOR ADDITIONAL INFORMATION

These resources contain information on deicing chemicals, related studies, or BMPs. All of the documents listed are available for free on the Internet. State departments of transportation, whose contact information can be found on the Internet or in the phone book, are also good sources of information.

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The Salt Institute, 700 N. Fairfax Street, Suite 600, Fairfax Plaza, Alexandria, VA 22314-2026 703.549.4648. Website contains useful information on salt storage and its Sensible Salting Program. <a href="http://www.saltinstitute.org">http://www.saltinstitute.org</a>

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Transportation Research Board, National Research Council. (1991) *Highway Deicing: Comparing Salt and Calcium Magnesium Acetate.* Special Report 235. <a href="http://gulliver.trb.org/publications/sr/sr235.html">http://gulliver.trb.org/publications/sr/sr235.html</a>

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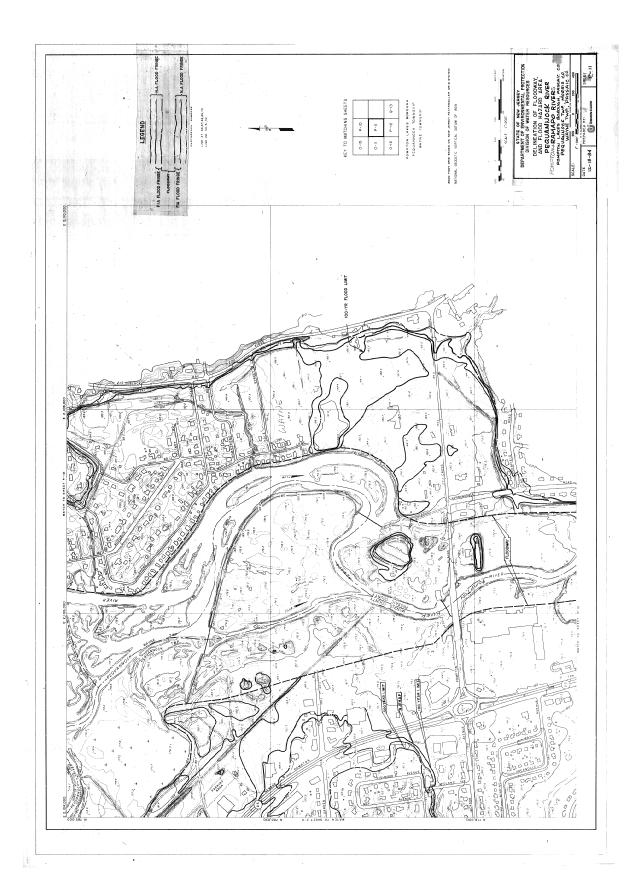
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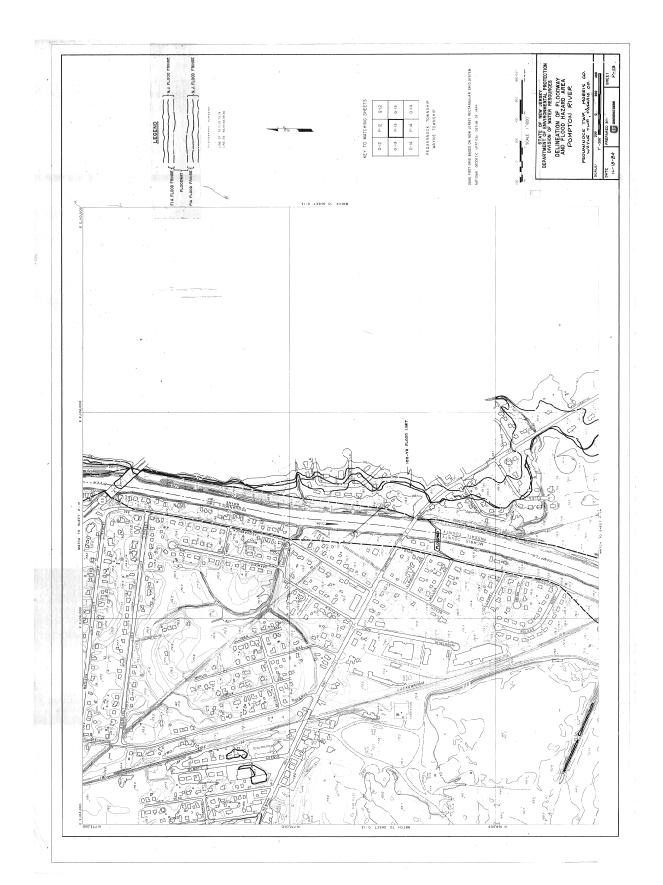
Winter Maintenance Virtual Clearinghouse, Federal Highway Administration. U.S. Department of Transportation. <a href="http://www.fhwa.dot.gov/winter">http://www.fhwa.dot.gov/winter</a>

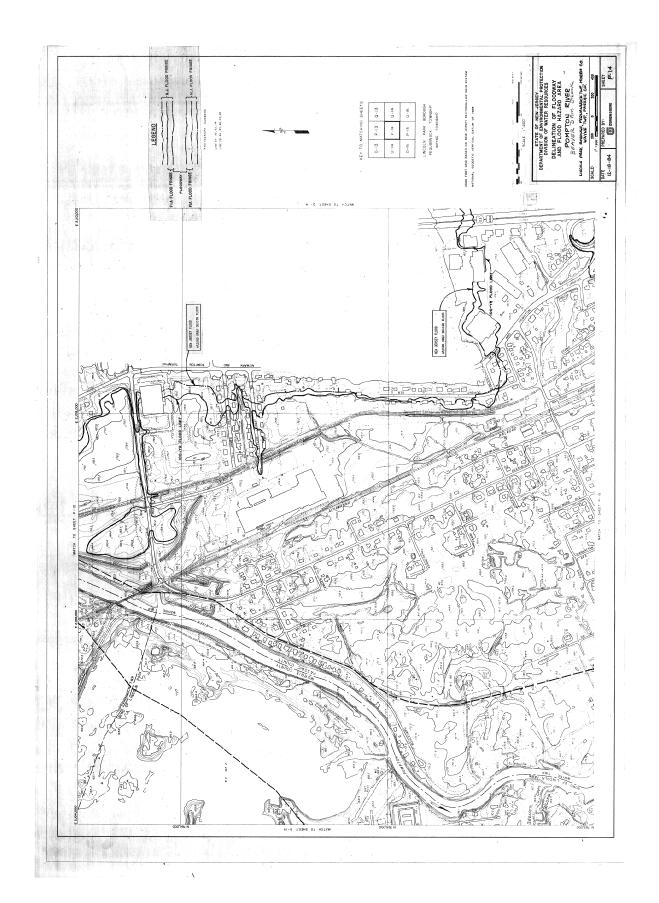
# **Appendix B:**

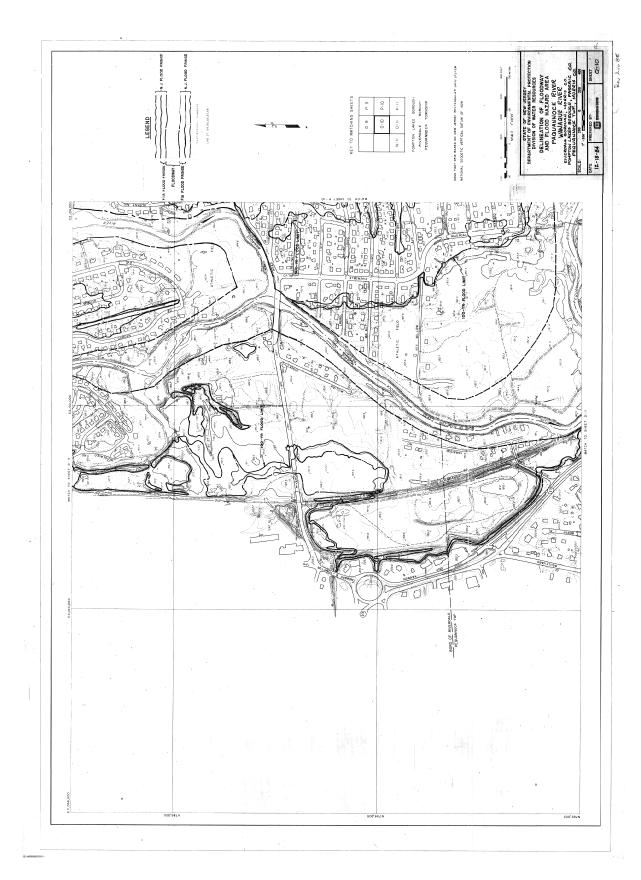
## Flood Maps of Pequannock Township

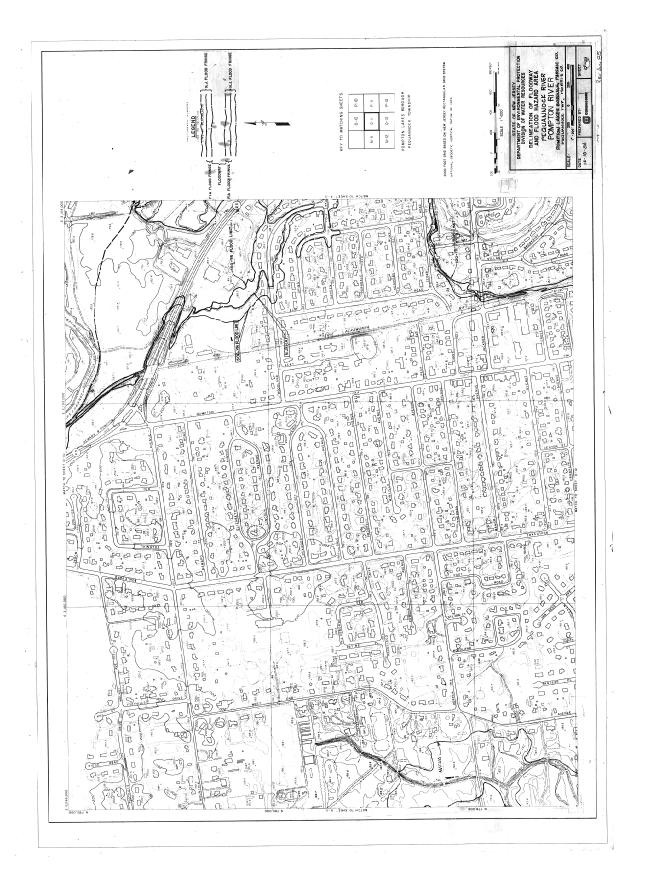


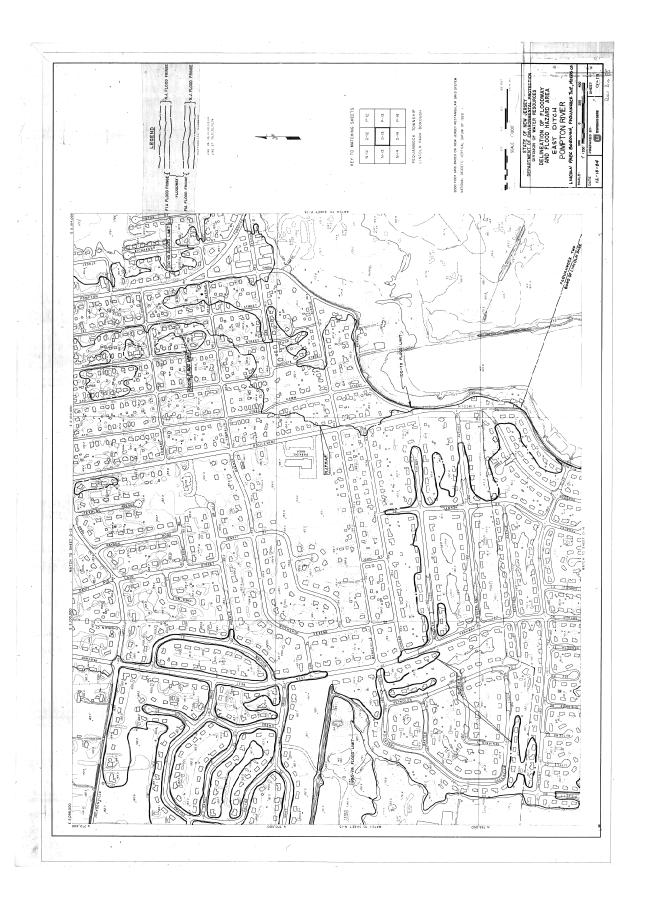




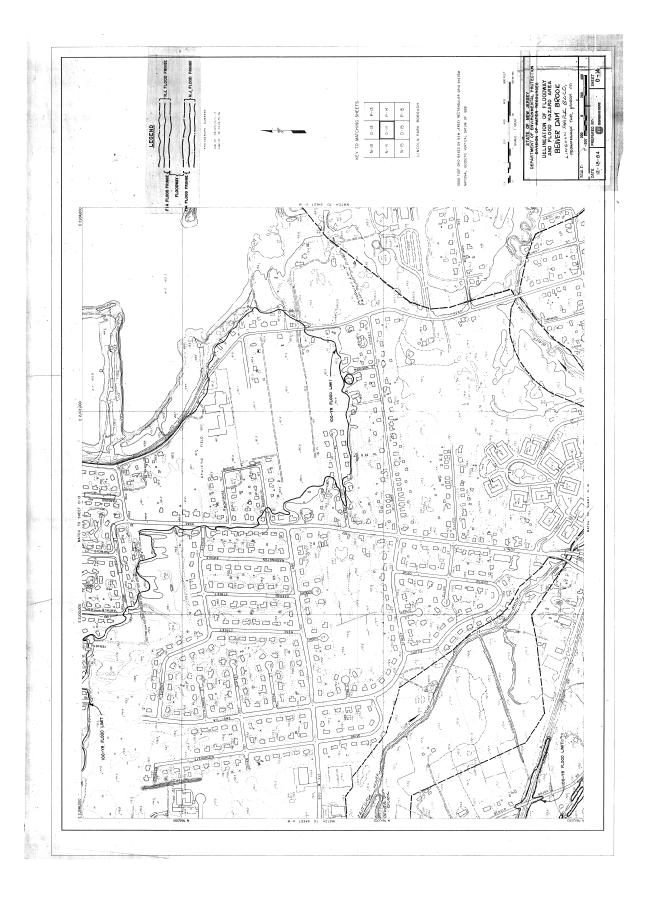


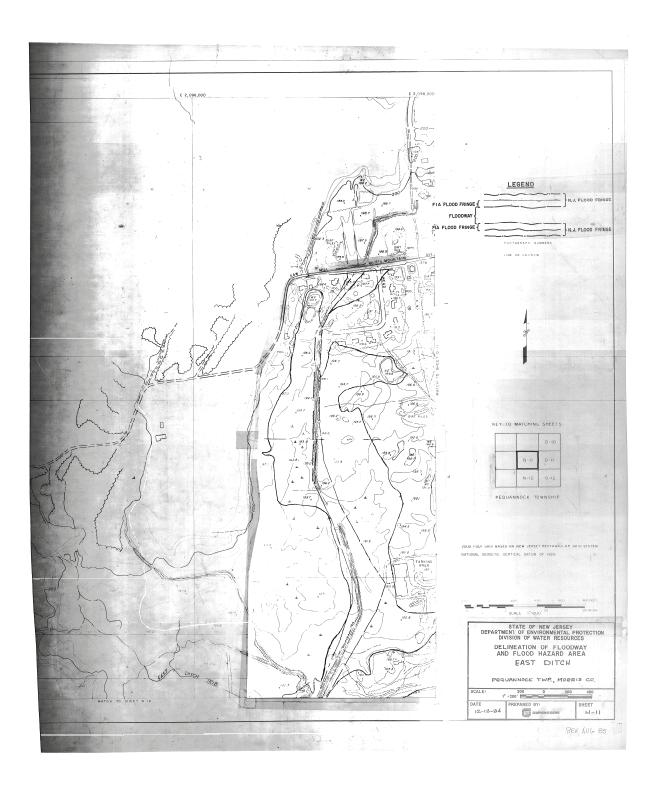


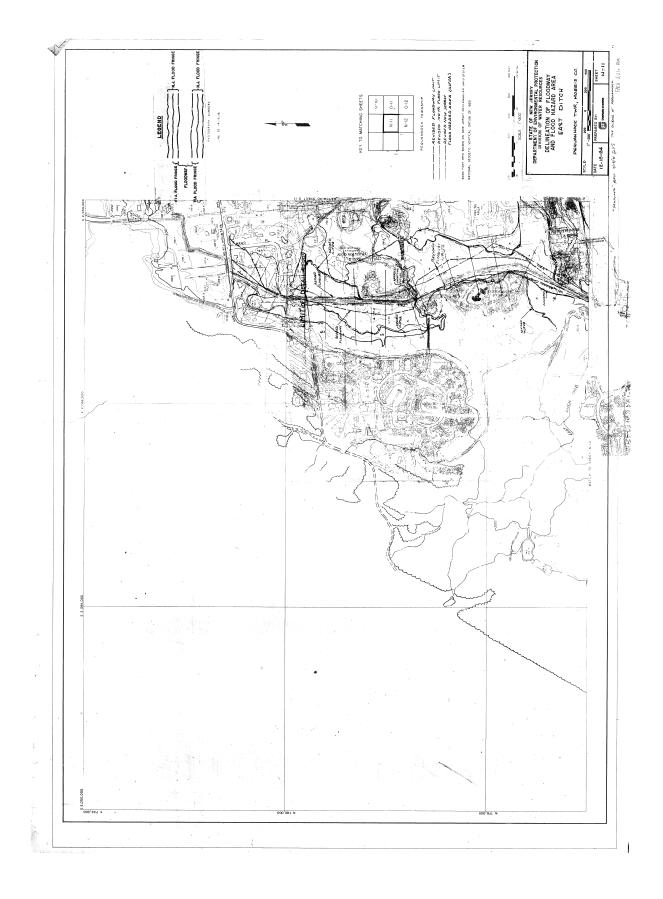


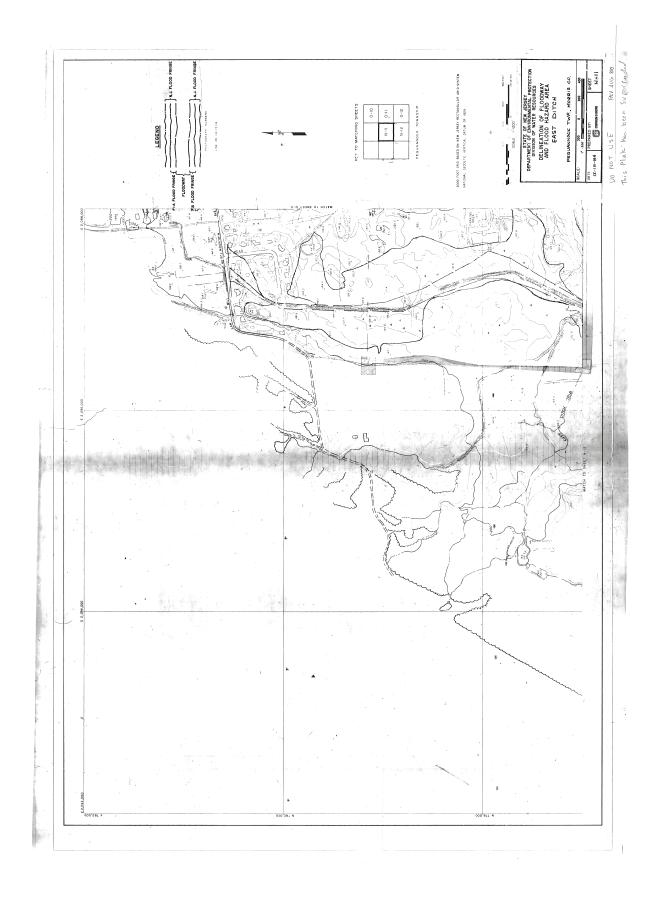


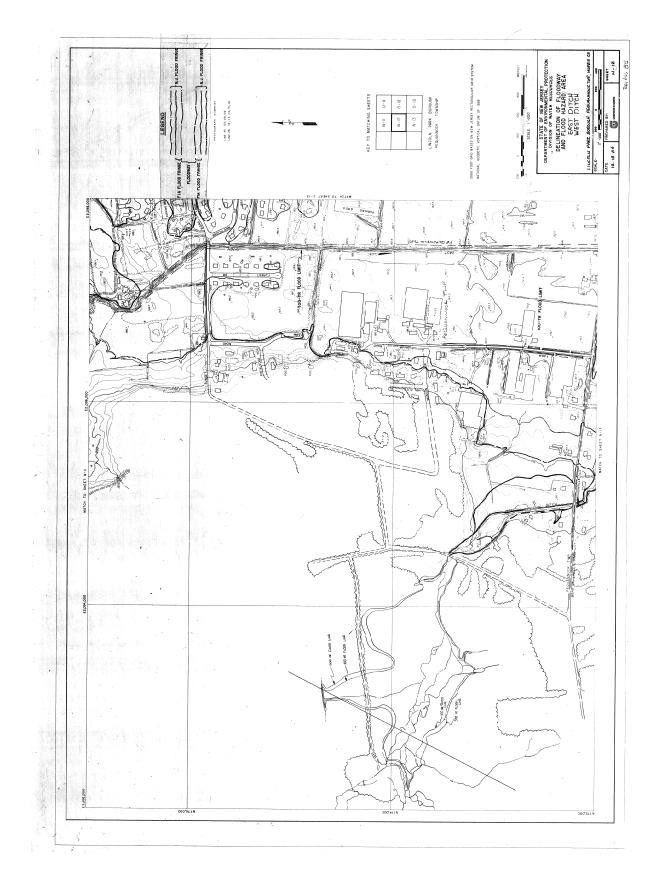












# Appendix C: Soil Types of Pequannock Township

### MAP SYMBOL: AdrAt (Adrian Muck)

SOIL SERIES: Adrian

CHARACTERISTICS: The Adrian series consists of very deep, very poorly drained soils formed in herbaceous organic material over sandy deposits on outwash plains, lake plains, lake terraces, flood plains, moraines, and till plains. Permeability is moderately slow to moderately rapid in the organic material and rapid in the sandy material. Slope ranges from 0 to 1 percent. Mean annual precipitation is about 35 inches, and mean annual temperature is about 50 degrees F.

TAXONOMIC CLASS: Sandy or sandy-skeletal, mixed, euic, mesic Terric Haplosaprists

TYPICAL PEDON: Adrian muck, on a less than 1 percent slope under marsh vegetation at an elevation of 654 feet. (Colors are for moist soil unless otherwise stated.)

Oa1--0 to 16 inches; black (10YR 2/1) broken face, black (N 2.5/0) rubbed muck (sapric material); about 12 percent fiber, less than 5 percent rubbed; moderate medium granular structure; primarily herbaceous fibers; neutral (pH 7.0 in water); abrupt wavy boundary.

Oa2--16 to 20 inches; black (10YR 2/1) broken face, very dark brown (10YR 2/2) rubbed muck (sapric material); about 15 percent fibers, less than 5 percent rubbed; weak coarse subangular blocky structure; primarily herbaceous fibers; slightly acid (pH 6.5 in water); gradual wavy boundary.

Oa3--20 to 27 inches; black (10YR 2/1) broken face, black (10YR 2/1) rubbed muck (sapric material); about 12 percent fibers, less than 5 percent rubbed; weak thick platy structure; primarily herbaceous fibers; moderately acid (pH 6.0 in water); gradual wavy boundary.

Oa4--27 to 34 inches; black (10YR 2/1) broken face, black (10YR 2/1) rubbed muck (sapric material); about 12 percent fibers, less than 5 percent rubbed; massive; primarily herbaceous fibers; strongly acid (pH 5.5 in water); abrupt smooth boundary. (Combined thickness of the Oa horizon is 16 to 51 inches.)

Cg1--34 to 60 inches; gray (10YR 5/1) sand; single grain; loose; common medium prominent light olive brown (2.5Y 5/4) masses of iron oxide accumulation in the matrix; slightly alkaline; clear wavy boundary.

Cg2--60 to 80 inches; dark gray (2.5Y 4/1) fine sand; single grain, loose; strongly effervescent; moderately alkaline.

TYPE LOCATION: Gratiot County, Michigan; about 1 1/2 miles southeast of Ashley; 2,040 feet north and 100 feet east of the southwest corner of sec. 16, T. 9 N., R. 1 W.; U.S.G.S. Ashley, MI topographic quadrangle; lat. 43 degrees 10 minutes 2.4 seconds N. and long. 84 degrees 26 minutes 50.6 seconds W., NAD 27; UTM Zone 16, 707498 easting and 4782563 northing, NAD 83.

RANGE IN CHARACTERISTICS: The difference between mean summer and mean winter soil temperature is 17 to 25 degrees F., or more. The depth to the sandy C horizon ranges from 16 to 51 inches. The organic materials are derived primarily from herbaceous plants, but some layers contain as much as 50 percent material of woody origin.

The surface tier (Oa1 or Oap horizon) has hue of 5YR to 10YR, or is neutral, value of 2 or 2.5, and chroma of 0 to 3. It is dominantly muck (sapric material), however, some pedons have mucky peat (hemic material). Some pedons have a thin mat, 1 to 4 inches thick, of sphagnum moss on the surface. Reaction ranges from strongly acid to neutral.

The subsurface and bottom tiers (Oa, Oe, or Oi horizons) have hue of 2.5YR to 10YR, or are neutral, value of 2, 2.5, or 3, and chroma of 0 to 3. It is dominantly muck (sapric material). Thin layers, less than 10 inches thick, of mucky peat (hemic material) are in some pedons. Thin layers, less than 5 inches thick, of peat (fibric material) are in some pedons. In some pedons a sedimentary peat layer 1 to 2 inches thick is present above the C horizon. Reaction ranges from strongly acid to neutral.

The C or Cg horizon has hue of 2.5YR to 5Y, or is neutral, value of 2 to 6, and chroma of 0 to 4. It is sand, coarse sand, fine sand, or loamy sand, or their gravelly or very gravelly analogues. Strata of finer textures occur in some pedons. Rock fragment content ranges from 0 to 60 percent. Reaction ranges from slightly acid to moderately alkaline.

COMPETING SERIES: These are the Fishtrap and Timakwa (T) series. Fishtrap soils have a difference of less than 16 degrees F., between mean summer and mean winter soil temperatures and are more acid than slightly acid in the mineral underlying materials. Timakwa soils are derived primarily from woody organic materials and have woody fragments 3/4 inch to a foot in diameter in some part of the organic materials. Timakwa soils are also in wetter regions of Land Resource Region R and S and have a mean annual precipitation of 47 inches.

GEOGRAPHIC SETTING: Adrian soils formed in herbaceous organic material over sandy deposits and occupy shallow closed depressions primarily on outwash plains, lake plains, lake terraces, and flood plains, but can occur within moraines and till plains. Areas range from a few acres to several hundred acres in size. Slope gradients range from 0 to 1 percent. Usually adjacent upland soils are sandy. Mean annual temperature ranges from 48 to 53 degrees F., mean annual precipitation ranges from 29 to 45 inches, frost-free period ranges from 120 to 180 days, and elevation ranges from 580 feet to 1,530 feet above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Antung, Edselton, Houghton and Granby soils. The very poorly drained Antung, Edselton, and Houghton soils are on similar landform positions as Adrian soils. Antung soils formed in less than 16 inches of herbaceous organic material. Edselton soils are underlain by marl and sand. Houghton soils formed in herbaceous organic deposits more than 51 inches thick and are the most common associate. The poorly drained or very poorly drained Granby soils are sandy throughout, and generally are at the margins of the depressi

DRAINAGE AND PERMEABILITY: Very poorly drained. The potential for surface runoff is negligible. Permeability is moderately slow to moderately rapid in the organic material and rapid in the sandy material. The depth to the top of an apparent seasonal high water table ranges from 1 foot above the surface to 1 foot below the surface from September to June in normal years. In the flooded phase, areas are subject to frequent flooding for long periods between October and June.

USE AND VEGETATION: Most of this soil is in native vegetation. Much of it is in marsh grasses including sedges, reeds, grasses, and shrubs such as willow, alder, quaking aspen, and dogwood. Some areas have been drained to various degrees and are used for hay and pasture. A small proportion is used for cropland. Corn and truck crops are the principal crops.

DISTRIBUTION AND EXTENT: MLRAs 95B, 96, 97, 98, 99, 111, 115, and possibly in 100, 105, 110, 114, and 120 in the southern parts of lower Michigan, Connecticut, Iowa, Illinois, Indiana, Minnesota, New York, New Jersey, Ohio, Rhode Island, Vermont, and Wisconsin. The soils are of large extent, about 395,000 acres.

MLRA OFFICE RESPONSIBLE: Indianapolis, Indiana.

SERIES ESTABLISHED: Sanilac County, Michigan, 1955.

REMARKS: Several flooded phases and depth phases have been recognized. These phases will need to be evaluated during modernization updates. Drained and undrained phases have been recognized.

Diagnostic horizons and features recognized in this pedon are: sapric material - from the surface to 34 inches (Oa1, Oa2, Oa3, and Oa4 horizons); terric feature - mineral material from 34 to 60 inches (Cg horizon).

.ADDITIONAL DATA: Transect data (T98-MI-005) is on file in the MLRA project office in Plymouth, Indiana. Transect shows 50 percent Adrian and similar soils, 20 percent Antung soils, 20 percent Houghton soils, and 10 percent Edselton soils. Characterization data is available from the National Soil Survey Laboratory, Lincoln, NE.

# MAP SYMBOL: BohB (Boonton Moderately well drained gravely loam, 3-8 percent slopes), BohC (Boonton Moderately well drained gravely loam, 8-15 percent slopes) SOIL SERIES: Boonton

Characteristics: The Boonton series consists of deep or very deep moderately well and well drained soils formed in till on uplands. They are moderately deep to a fragipan. Slope ranges from 0 to 50 percent. Saturated hydraulic conductivity is moderately low to high above the fragipan and low or very low in the fragipan and low to high in the substratum. Mean annual temperature is about 54 degrees F. and mean annual precipitation is about 43 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Typic Fragiudalfs

TYPICAL PEDON: Boonton silt loam idle pasture, at an elevation of about 155 feet. (Colors are for moist soil.)

Ap--0 to 8 inches; brown (10YR 4/3) silt loam; moderate fine and medium granular structure; very friable; many fine and common medium and coarse roots; many fine and medium tubular pores; common uncoated sand grains; 5 percent subangular stones, cobbles, and gravel; very strongly acid; clear smooth boundary. (6 to 10 inches thick)

BA--8 to 15 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; very friable; many fine and common medium and coarse roots; common fine tubular pores; many coated sand grains; 10 percent gravel and cobbles; very strongly acid; clear wavy boundary. (0 to 9 inches thick)

Bt1--15 to 23 inches; brown (7.5YR 4/4) gravelly loam; moderate medium subangular blocky structure; friable; common fine and few medium and coarse roots; common fine tubular pores; common faint clay films on horizontal and vertical faces of peds; few distinct clay films lining pores; 15 percent gravel, 2 percent cobbles; strongly acid; clear wavy boundary.

Bt2--23 to 30 inches; brown (7.5YR 4/4) gravelly fine sandy loam; weak coarse and medium subangular blocky structure; friable; common fine and few medium and coarse roots; few fine tubular pores; few faint clay films on horizontal and vertical faces of peds; 20 percent gravel, 2 percent cobbles; strongly acid; abrupt smooth boundary. (Combined thickness of the Bt horizons is 12 to 22 inches.)

Btx--30 to 50 inches; dark reddish brown (5YR 3/4) gravelly sandy loam; strong very thick platy structure; very firm, brittle; few roots between peds; few fine vesicular pores; few distinct clay films on faces of peds; 20 percent gravel, 2 percent cobbles and stones; few fine distinct black (N 2/0) and few fine distinct brown (7.5YR 5/2) iron depletions; strongly acid; gradual wavy boundary. (10 to 30 inches thick)

Cd--50 to 65 inches; dark reddish brown (5YR 3/4) gravelly sandy loam; weak medium and thick platy structure in upper part and massive in lower part; very firm, brittle; 25 percent gravel, 2 percent cobbles; slightly acid.

TYPE LOCATION: Passaic County, New Jersey; Totowa Borough, 0.2 mile northeast of Totowa Road on Brookmans Lane, 585 feet east of Brookmans Lane in idle pasture. USGS Paterson quadrangle; latitude 40 degrees, 54 minutes, 44 seconds N, longitude 74 degrees, 12 minutes, 11 seconds W, NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 36 to more than 60 inches. Depth to bedrock is more than 4 feet. The top of the fragipan is at a depth of 20 to 36 inches. In most pedons the upper part of the fragipan is part of the argillic horizon. Rock fragments of mostly rounded gravel occur throughout the soil, and range from 0 to 35 percent in individual horizons. Stones and cobbles range from 0 to 10 percent in the solum and from 0 to 20 percent in the substratum. Reaction is strongly acid to extremely acid in

the upper part of the solum. It ranges from strongly acid to slightly acid in the lower part of the solum, and from moderately acid to neutral in the C horizon.

Some pedons have O horizons up to 3 inches thick with hue of 10YR, value of 2 or 3, and chroma of 1 or 2. In lieu texture is slightly decomposed to highly decomposed plant material

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. Texture of the Ap or A horizon is silt loam, loam, fine sandy loam or sandy loam in the fine earth fraction. Some pedons have thin unplowed A horizons up to 2 inches thick with color and texture the same as the Ap.

The BA or BE horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. Texture is silt loam, loam or fine sandy loam in the fine earth fraction.

The Bt horizon has hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 4 to 6. Pedons with the redder hues have a higher proportion of red sandstone or shale. Few or common redoximorphic features are in some pedons but depletions with chroma of 2 or less are absent in the upper 10 inches of the Bt horizon. Texture is fine sandy loam, sandy loam, loam, or silt loam in the fine earth fraction. Structure is commonly moderate to weak, coarse to fine subangular blocky. Some pedons have platy structure in places.

The Bx horizon has hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. Redoximorphic features range from common to few, fine to coarse, and faint to distinct. Texture is sandy loam, fine sandy loam or loam in the fine earth fraction. Structure is weak or moderate very coarse prismatic to moderate or strong, thin to very thick platy. The Bx horizon is very firm or firm, and brittle.

The C layer has hue of 2.5YR to 10YR, value of 3 to 6, and chroma of 3 to 6. It is commonly loam, sandy loam, fine sandy loam, or loamy fine sand in the fine earth fraction but the range includes loamy sand in some places. It has weak medium to thick platy layers or is massive, and consistence ranges from very firm to very friable. In some pedons the C layer is loose friable till.

COMPETING SERIES: There are no other series currently in the same family.

The Readington, Rockaway, Turbotville, and Wooster series are in related families. Rockaway soils have rock fragments dominated by granitic gneiss and have less than 35 percent base saturation in the lower part of the solum and C horizon. Readington, Turbotville, and Wooster soils are fine-loamy.

GEOGRAPHIC SETTING: Boonton soils are on gently sloping to very steep uplands. Slope is usually smooth and regular and gradient ranges from 0 to 50 percent. The soils formed in glacial till composed mostly of red to brown shale, sandstone, basalt, and some granitic gneiss. The climate is humid temperate; mean annual temperature ranges from 50 to 57 degrees F, precipitation ranges from 40 to 45 inches. Frost free season is 130 to 150

days.

GEOGRAPHICALLY ASSOCIATED SOILS: Holyoke and Haledon are the most extensive associated soils and are developed from similar materials. Holyoke soils are shallow to basalt bedrock and usually are on higher and steeper positions in the landscape. Haledon soils have low chroma depletions in the top 10 inches of the argillic horizon and are in lower positions in the landscape, in drainageways, or at the base of steeper slopes. Other associated soils are Riverhead and Dunellen which formed in stratified, water sorted material.

DRAINAGE AND PERMEABILITY: Moderately well and well drained. Runoff is slow to rapid. Permeability is moderate or moderately rapid above the fragipan and very slow in the fragipan. Permeability in the substratum is very slow to moderately rapid. Saturated hydraulic conductivity is moderately low to high above the fragipan and low or very low in the fragipan and low to high in the substratum. There is a perched water table at a depth of 1.5 to 3 feet from November to May of most years.

USE AND VEGETATION: Most Boonton soils are in areas that have become highly urbanized. Undeveloped sites are wooded or idle fields. Wooded areas have oaks, red maple, white ash, hickory, gray birch, and dogwood trees.

DISTRIBUTION AND EXTENT: Till uplands in Northeastern New Jersey; MLRA 144A. The series is of moderate extent (20,000 acres).

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Morris County, New Jersey 1971.

REMARKS: Alfisols classification is inferred from decreasing acidity and the high proportion of ultra basic grains and fragments in the lower part of the solum and C horizon. CE activity class is inferred from similar soils. Geographic coordinates were determined from the narrative description for the type location.

Diagnostic horizons and feature recognized in this pedon include:

- 1. Ochric epipedon the zone from the surface of the soil to a depth of 15 inches (Ap and BA horizons).
- 2. Argillic horizon the zone from 15 to 30 inches (Bt horizon).
- 3. Fragipan the zone from 30 to 50 inches (Bx horizon).
- 4. Densic materials the zone from 50 to 65 inches (Cd horizon).

## MAP SYMBOL: CarAt (Carlisle muck, 0-2 percent slopes, frequently flooded)

SOIL SERIES: Carlisle

CHARACTERISTICS: The Carlisle series consists of very deep, very poorly drained soils formed in woody and herbaceous organic materials in depressions within lake plains, outwash plains, ground moraines, flood plains and moraines. These soils have moderately

slow to moderately rapid permeability. Slope ranges from 0 to 2 percent. Mean annual precipitation is about 32 inches, and mean annual temperature is about 48 degrees F.

TAXONOMIC CLASS: Euic, mesic Typic Haplosaprists

TYPICAL PEDON: Carlisle muck - on a nearly level cut-over area. (Colors are for moist soil unless otherwise stated.)

Oa1--0 to 8 inches; black (10YR 2/1) broken face and rubbed sapric material; about 10 percent fibers, less than 5 percent rubbed; weak fine granular structure; friable; about 15 percent weakly decomposed wood fragments; neutral; abrupt smooth boundary.

Oa2--8 to 31 inches; dark reddish brown (5YR 2/2) broken face and rubbed sapric material; about 10 percent fibers, about 5 percent rubbed; weak coarse granular structure; friable; about 25 percent woody fragments 1/4 to 5 inches in diameter; neutral; clear smooth boundary.

Oa3--31 to 46 inches; dark reddish brown (5YR 3/2) broken face; dark reddish brown (5YR 2/2) rubbed sapric material; about 25 percent fiber, 8 percent rubbed; massive; friable; about 25 percent wood fragments 1/4 to 5 inches in diameter; slightly acid; clear smooth boundary.

Oa4--46 to 60 inches; dark reddish brown (5YR 3/4) broken face; dark reddish brown (5YR 2/2) rubbed sapric material; about 40 percent fiber, 12 percent rubbed; massive; friable; about 1 percent woody fragments 1/4 to 3 inches in diameter; neutral.

TYPE LOCATION: Shiawassee County, Michigan; 520 feet north and 1,200 feet west of the southeast corner of sec. 13, T. 5 N., R. 3 E.

RANGE IN CHARACTERISTICS: The reaction throughout the pedon ranges from very strongly acid to slightly alkaline. Woody fragments occur throughout the profile in most pedons, consisting of twigs, branches, logs or stumps and average from 15 to 30 percent by volume in the control section. Fragments range in size from 1/4 to more than a foot in diameter. The mean annual soil temperature ranges from 47 to 54 degrees F.

The surface tier has hue of 10YR to 5YR or is neutral; value is 1 or 2 and the chroma ranges from 0 to 2. It is dominantly sapric material; however, some pedons contain hemic material and others have various proportions of both sapric and hemic materials. Some pedons have a thin fibric surface layer up to 2 inches thick. The structure of the surface tier is weak or medium, coarse to fine granular, or subangular blocky. Overwash phases have surface textures of silt loam or silty clay loam.

The subsurface tier has hue of 5YR, 7.5YR or 10YR, value of 2 or 3, and chroma of 0 to 4. Chroma or value or both may change from 0.5 to 2 units upon rubbing. Broken faces become darker upon brief exposure to air. The layer is dominated by sapric material with a rubbed fiber content of less than 16 percent of the organic volume. The

subsurface tier has granular or blocky structure or is massive. The upper portion typically has weak or moderate, fine to coarse granular or blocky structure. The lower portion commonly is massive, but in some pedons it has platy structure. The aggregates in this tier are quite firm, but break abruptly under pressure.

The unrubbed, well decomposed organic material resembles woody plant tissue. The bottom tier has colors similar to the subsurface tier and has variable amounts of woody and herbaceous layers; however, herbaceous fibers generally constitute the greater proportion. This tier commonly is massive but in some pedons it has weak coarse blocky or thick platy structure. The subsurface and bottom tiers are dominantly sapric material but some pedons have thin layers of hemic material. The combined thickness of these hemic layers is less than 10 inches.

COMPETING SERIES: These are the Catden, Houghton, Lena, Peteetneet, Saltese, and Semiahmoo series. Catden soils have dominantly woody fibers in the bottom tier. Houghton soils formed primarily from herbaceous fibers and average less than 15 percent woody fragments in the control section. Lena soils have carbonates in the control section. Peteetneet, Saltese, and Semiahmoo soils have less than 15 percent woody fragments in the control section.

GEOGRAPHIC SETTING: Carlisle soils occupy depressions within lake plains, outwash plains, ground moraines, and flood plains. These soils formed in woody and herbaceous organic materials. Slope ranges from 0 to 2 percent. Elevations are 250 to 3,800 feet. The mean annual precipitation ranges from 30 to 47 inches, and the mean annual temperature ranges from 45 to 55 degrees F. The frost free period is 110 to 180 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Adrian, Edwards, Linwood and Willette soils. These soils have a mineral layer in the control section. Poorly drained or very poorly drained mineral soils such as Granby, Lenawee or Parkhills occur at the margins of Carlisle areas as they grade into the upland.

DRAINAGE AND PERMEABILITY: Very poorly drained. Depth to the seasonal high water table ranges from 2.0 feet above the surface to 1 foot below the surface from September to June. The potential for surface runoff is low or negligible. Permeability is moderately slow to moderately rapid.

USE AND VEGETATION: A high proportion of these soils have been drained and are used for truck crops or pasture. Major crops include onions, potatoes, corn, radishes, celery, carrots, and lettuce. Some areas are used for small grains, hay, and sod production. The remaining portion is in woodland or cut-over woodland. Major tree species include American elm, white ash, red maple, willow, tamarack, quaking aspen, and alder.

DISTRIBUTION AND EXTENT: Southern Michigan, Connecticut, Indiana, Massachusetts, Ohio, Wisconsin, New York, New Jersey, Pennsylvania, Rhode Island and Vermont, in MLRA's 99, 100, 101, 111, 139, 140, 142, 144A, 144B, and 145. The series is of large extent, about 248,000 acres.

MLRA OFFICE RESPONSIBLE: Indianapolis, Indiana.

SERIES ESTABLISHED: Livingston County, Michigan, 1923.

REMARKS: Diagnostic horizons and features recognized in this pedon are: Sapric material - the zone from the surface to 60 inches (Oa1, Oa2, Oa3 and Oa4 horizons).

This concept corresponds similarly to previous concepts of the Carlisle series, primarily in having developed from woody fibers. To define this woody characteristic as sapric material is difficult to do precisely. There does appear to be a definite difference in structure and a tendency toward brittleness in the aggregates developed from woody fibers vs. those developed from herbaceous fibers.

# MAP SYMBOL: FNAT (Fluvaquents and udifluvents, 0-3 percent slopes, frequently flooded)

SOIL SERIES: None

CHARACTERISTICS:

Local Physiographic Area: Countywide

Geomorphic Setting: River valley, flood plain

Parent Material: Recent alluvium

Drainage Class: Somewhat poorly drained

Soil Depth Class: Very deep

Slope: 0 to 3 percent

Associated Soils Udifluvents

Taxonomic Classification Fluvaquents

Typical Pedon

Fluvaquents loam in an area of Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded, in other grass/herbaceous cover; located in Byram Township, approximately 390 feet northwest from the intersection of Waterloo Road and River Road in Lookwood. USGS Stanhope quadrangle; Latitude: 40 degrees, 55 minutes, 19.50 seconds N.; Longitude: 74 degrees, 43 minutes, 50.63 seconds W.

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) loam; moderate fine granular

structure; friable; 1 percent fine distinct red (2.5YR 4/6) iron-manganese masses; strongly acid; clear smooth boundary.

A2—5 to 12 inches; dark gray (10YR 4/1) silt loam; moderate fine granular structure; friable; 30 percent fine distinct red (2.5YR 4/6) iron-manganese masses; strongly acid; clear smooth boundary.

C1—12 to 18 inches; grayish brown (2.5Y 5/2) sandy clay loam; massive; friable; 30 percent medium prominent yellowish red (5YR 4/6) iron-manganese masses; strongly acid; clear wavy boundary.

C2—18 to 24 inches; dark yellowish brown (10YR 4/6) sandy clay loam; massive; friable; 30 percent medium distinct strong brown (7.5YR 4/6) iron-manganese masses; 15 percent medium distinct light brownish gray (2.5Y 6/2) iron depletions; strongly acid; gradual wavy boundary.

C3—24 to 60 inches; light brownish gray (2.5Y 6/2) sandy loam; massive; friable; 30 percent medium prominent strong brown (7.5YR 4/6) iron-manganese masses; strongly acid.

Range in Characteristics

Thickness of solum: 6 to 30 inches or more Depth to bedrock: greater than 60 inches

Content and size of rock fragments: 0 to 35 percent gravel, by volume throughout

the soil

Reaction: variable Permeability: variable

#### A horizon:

Color - hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 1 to 6

Texture - variable

Structure - weak to moderate granular

Redoximorphic features - iron concentrations in shades of dark red

#### C horizon:

Color - hue of 7.5YR to 2.5Y, value of 3 to 7, and chroma of 2 to 6 Texture - variable

Structure - massive

Redoximorphic features - iron depletions in shades of light brownish gray and iron concentrations in shades of strong brown to yellowish red

# MAP SYMBOL: HanB (Haledon silt loam, 3-8 percent slopes), HanC (Haledon silt loam, 8-15 percent slopes)

SOIL SERIES: Haledon

CHARACTERISTICS: The Haledon series consists of very deep, somewhat poorly drained

soils in low positions on undulating uplands. They formed in glacial till. Slope ranges from 0 to 15 percent. Permeability is moderately rapid or moderate above the fragipan and slow or very slow in the fragipan and densic materials. Mean annual temperature is about 47 degrees F. and mean annual precipitation is about 44 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Aquic Fragiudalfs

TYPICAL PEDON: Haledon cobbly loam at an elevation of about 450 feet. (Colors are for moist soil.)

Ap--0 to 8 inches; very dark grayish brown (10YR 3/2) cobbly loam, gray (10YR 6/1) dry; moderate medium granular structure; very friable; many roots; common fine pores; 25 percent rock fragments of stones, cobbles and gravel; moderately acid; clear wavy boundary. (6 to 10 inches thick)

Bt1--8 to 16 inches; yellowish brown (10YR 5/4) cobbly loam; moderate medium subangular blocky structure; friable, slightly sticky; common roots that decrease in number with depth; common fine tubular pores; few faint brown (7.5YR 4/4) clay films on faces of peds and in sand and pebble niches; 20 percent rock fragments, dominantly cobbles and coarse gravel and some stones; common coarse and medium distinct brown (7.5YR 4/4) masses of iron accumulation, common fine and medium faint brown (10YR 5/3) iron depletions, and few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; moderately acid; gradual wavy boundary. (4 to 18 inches thick)

Bt2--16 to 30 inches; yellowish brown (10YR 5/4) and brown (7.5YR 4/4) cobbly loam; moderate medium subangular blocky structure; friable; few fine roots; few fine tubular pores; brown (7.5YR 4/4) clay films on faces of peds and common bridging with semi-waxy clay films; 20 percent rock fragments, dominantly cobbles and gravel; common coarse distinct dark brown (7.5YR 3/2) iron depletions, common fine faint pale brown (10YR 6/3) masses of iron accumulation, few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation, and few to common fine distinct light brownish gray (10YR 6/2) masses of iron accumulation and grayish brown (10YR 5/2) iron depletions that increase in number with depth; moderately acid; abrupt smooth boundary. (0 to 16 inches thick)

Bx1--30 to 38 inches; brown (7.5YR 4/4) gravelly sandy loam streaked and splotched with yellowish brown (10YR 5/4); weak very thick platy structure; very firm; brittle; few fine roots between peds or in structures; very few fine vesicular pores; very few distinct waxy and semi-waxy clay and silt coats on plate surfaces; common faint silt and clay bridging between sand grains; few fine black (10YR 2/1) manganese stains on ped surfaces; 20 percent rock fragments, dominantly gravel; moderately acid; clear smooth boundary. (6 to 20 inches thick)

Bx2--38 to 45 inches; variegated brown (7.5YR 4/4), light brownish gray (10YR 6/2), strong brown (7.5YR 5/6), yellowish brown (10YR 5/6), and brown (10YR 5/3) gravelly sandy loam; moderate very thick platy structure; very firm; brittle; very few fine vesicular pores; very few distinct clay films on faces of peds; few fine black (10YR 2/1) manganese

stains on ped surfaces; 20 percent rock fragments, dominantly gravel; moderately acid; abrupt smooth boundary. (0 to 20 inches thick)

Cd--45 to 72 inches; brown (10YR 4/3) gravelly sandy loam; massive; very firm; few fine vesicular pores; 30 percent rock fragments, dominantly gravel; slightly acid.

TYPE LOCATION: Passaic County, New Jersey; Township of Wayne, 10 feet west of unimproved dirt road, 1,000 feet north of junction of dirt road with Patterson-Hamburg turnpike. Junction of dirt road with turnpike is 1,600 feet east of entrance to north Jersey Country Club; USGS Paterson quadrangle, longitude 40 degrees 57 minutes 20 seconds N., latitude 74 degrees 12 minutes 45 seconds W, NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 40 to 60 inches. Depth to the fragipan is 24 to 36 inches. Depth to bedrock is greater than 6 feet. Rock fragments of mostly gravel, cobbles, and stones of basalt, shale, sandstone and gneiss range from 5 to 25 percent in the solum and from 15 to 35 percent in the substratum. Mineralogy is dominated by quartz, feldspar, amphibole and mica. Reaction ranges from extremely acid to moderately acid in the upper part of the solum, from strongly acid to slightly acid in the lower part of the solum and upper part of the C horizon, and from moderately acid to neutral in the lower part of the C horizon.

The O horizon, where present, has hue of 7.5YR or 10YR, value of 2, and chroma of 1 or 2. The in lieu texture is commonly highly decomposed plant material but the range includes slightly to highly decomposed plant material.

The Ap horizon has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 to 4. Value is 6 or more when dry. Some pedons have an A horizon up to 5 inches thick. It has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2. Texture is loam or silt loam in the fine-earth fraction.

Some pedons have a BA horizon. It has hue of 7.5YR or 10YR, value and chroma of 4 to 6. Texture has the same range as the A horizon.

The Bt horizon has hue of 5YR to 10YR and value of 4 to 8. Chroma ranges from 3 to 6 in the upper part of the B and from 1 to 6 in the lower part. Redoximorphic features are few to common in the upper part and range to many in the lower part. Low chroma redoximorphic features are within the top 10 inches of the Bt horizon. Texture is loam, silt loam, or fine sandy loam in the fine-earth fraction.

The Bx horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 2 to 6, or it is mottled or variegated with these and other colors. Black stains are in most pedons. Texture is sandy loam, fine sandy loam, or loam in the fine-earth fraction. Structure is weak or moderate very thick platy or the horizons are massive. Consistence is firm or very firm.

The Cd horizon has hue of 2.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 6. High and low chroma redoximorphic features and black stains are in most pedons. Texture ranges

from loam to sandy loam in the fine-earth fraction.

COMPETING SERIES: There are no other series in the same family.

Related soils in other families are the Boonton, Califon, Hibernia, Rockaway, Wethersfield and Wurtsboro soils. Boonton and Rockaway soils do not have low chroma redoximorphic features in the upper 10 inches of the argillic horizon. Califon and Hibernia soils have less then 35 percent base saturation. Wethersfield and Wurtsboro soils do not have argillic horizons.

GEOGRAPHIC SETTING: Haledon soils are at the base of steeper sloping uplands and in shallow drainageways. Slope ranges from 0 to 15 percent. The soils developed in coarse textured glacial till composed primarily of basalt, red sandstone and shale, and granitic gneiss with lesser amounts of quartzite and gray sandstone and shale. The mean annual precipitation ranges from 40 to 48 inches. The mean annual temperature ranges from 45 to 50 degrees F. The frost-free days range from 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Boonton, Rockaway and the Holyoke soils. Boonton and Rockaway soils usually are in higher positions in the landscape. Holyoke soils are in a higher position in the landscape and are shallow to bedrock.

DRAINAGE AND PERMEABILITY: Somewhat poorly drained. Surface runoff is medium to very high. Permeability is moderate or moderately rapid above the fragipan and slow to very slow within the fragipan. Saturated hydraulic conductivity is moderately high or high. A perched high water table is within 12 inches of the surface in the late winter and early spring of most years, and following periods of extended rainfall. Lateral seepage is common, particularly at slope breaks.

USE AND VEGETATION: Most areas are wooded or in idle fields. Much of this soil is used for housing or urban development. Vegetation is largely forest dominated by oak and maple with some birch and ash.

DISTRIBUTION AND EXTENT: Northeastern New Jersey; MLRA 144A. The series is of moderate extent.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Morris County, New Jersey, 1971.

REMARKS: Diagnostic horizons and other features recognized in this pedon include:

- 1. Ochric epipedon the zone from 0 to 8 inches (Ap horizon).
- 2. Argillic horizon the zone from 8 to 30 inches (Bt horizon).
- 3. Fragipan the very firm, brittle zone from 30 to 45 inches (Bx horizon).
- 4. Aquic feature low chroma redoximorphic features are in the upper 10 inches of the

argillic horizon (Bt2 horizon).

## MAP SYMBOL: HhmCa (Hibernia loam, 3-15 percent slopes, stony), HhmDb (Hibernia loam, 15-25 percent slopes, very stony)

SOIL SERIES: Hibernia

CHARACTERISTICS: The Hibernia series consists of very deep, somewhat poorly drained soils in low positions on undulating uplands. The soils are shallow or moderately deep to a fragipan. They formed in till and colluvial material. Slope ranges from 0 to 25 percent. Permeability is moderate above the fragipan, slow in the fragipan, and moderate to rapid in the substratum. Mean annual temperature is about 52 degrees F. and mean annual precipitation is about 50 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Aquic Fragiudults

TYPICAL PEDON: Hibernia cobbly loam - in a wooded area at an elevation of about 1195 feet. (Colors are for moist soil.)

A--0 to 5 inches; very dark grayish brown (10YR 3/2) cobbly loam; weak fine granular structure; very friable; many fibrous and fine roots; common fine vesicular pores; common uncoated sand grains; 30 percent stones, cobbles, and gravel; very strongly acid; clear wavy boundary. (1 to 5 inches thick)

BA--5 to 9 inches; yellowish brown (10YR 5/6) cobbly sandy loam; weak medium subangular blocky structure; friable; common fibrous and fine roots; common fine vesicular pores; few faint silt coatings on pebbles and faces of peds and faint bridging with silt and sand grains; few clean sand grains; 20 percent stones, cobbles, and gravel; strongly acid; clear wavy boundary. (0 to 8 inches thick)

Bt1--9 to 16 inches; yellowish brown (10YR 5/4) cobbly sandy loam; moderate medium subangular blocky structure; friable; common fibrous and few fine roots; common fine vesicular pores; few faint brown (7.5YR 4/4) clay films on faces of peds and in sand pebble niches; 20 percent stones, cobbles, and gravel in approximately equal proportions; common fine and medium distinct yellowish brown (10YR 5/6) iron accumulations and common fine and medium prominent strong brown (7.5YR 5/8) and light yellowish brown (2.5Y 6/4) iron accumulations; strongly acid; clear wavy boundary.

Bt2--16 to 25 inches; yellowish brown (10YR 5/6) cobbly sandy loam; moderate medium subangular blocky structure; friable; few fibrous and fine roots; few fine vesicular pores; few distinct brown (7.5YR 4/4) clay films on faces of peds and in sand and pebble niches; 20 percent stones, cobbles, and gravel in approximately equal proportions; common fine and medium prominent strong brown (7.5YR 5/8) iron accumulations and common fine and medium prominent grayish brown (10YR 5/2) and light brownish gray (2.5Y 6/2) iron depletions; strongly acid; clear smooth boundary. (Combined thickness of the Bt horizons is 5 to 32 inches.)

Bx--25 to 36 inches; dark yellowish brown (10YR 4/4) gravelly sandy loam; coarse wedge-

shaped elongated mottles that have strong brown (7.5YR 5/8) exteriors and light yellowish brown (2.5Y 6/4) to light brownish gray (2.5Y 6/2) interiors; weak thick platy structure; firm, brittle; few very fine noncontinuous pores; 25 percent gravel, cobbles, and stones; few strong brown to yellowish red iron oxide and black manganese stains on plate surfaces; strongly acid; gradual wavy boundary. (6 to 18 inches thick)

C1--36 to 62 inches; light olive brown (2.5Y 5/4) gravelly sandy loam; massive; firm; few very fine continuous pores; 25 percent gravel, cobbles, and stones; common coarse distinct light brownish gray (2.5Y 6/2) iron depletions and common coarse prominent yellowish brown (10YR 5/8) and brown (7.5YR 4/4) iron accumulations; strongly acid; clear smooth boundary.

C2--62 to 72 inches; brown (10YR 5/3) and light olive brown (2.5Y 5/4) very gravelly loamy sand; single grain; loose; 40 percent gravel, cobbles, and stones, strongly acid.

TYPE LOCATION: Passaic County, New Jersey; Township of West Milford, 20 feet west of Lud Day Road at a point 1.83 miles north of intersection of Stickles Road and Lud Day Road; USGS Newfoundland quadrangle; latitude N. 41 degrees 06 minutes 15 seconds, longitude W. 74 degrees 27 minutes 42 seconds, NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 24 to 50 inches. Depth to the fragipan ranges from 18 to 36 inches. Depth to bedrock is typically greater than 6 feet. Rock fragments range from 5 to 35 percent throughout the solum, and from 0 to 60 percent in the C horizon. Rock fragments are a mixture of gravel, cobbles, stones, and boulders in varying proportions. The rock fragments are primarily granitic gneiss with smaller amounts of sandstone, quartzite, and shale. Quartz, feldspar, and mica, with smaller amounts of ferromagnesian minerals dominate mineralogy. Reaction ranges from extremely acid through strongly acid in the A and BA horizons, except where limed, and is very strongly acid or strongly acid in the B and C horizons.

The A horizon has hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 1 through 3. Ap horizons have hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 2 through 4. Textures range from silt loam to sandy loam in the fine-earth fraction. Structure is weak or moderate, fine or medium granular or subangular blocky. Consistence is friable or very friable

Some pedons have an E horizon 2 to 5 inches thick. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4. The range for texture, structure, and consistence is the same as that for the A horizon.

The BA or BE horizon has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 4 through 6. Texture ranges from silt loam to sandy loam in the fine-earth fraction. Structure is weak or moderate, fine or medium subangular blocky. Consistence is friable or very friable.

The Bt horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 4

through 6. It has redoximorphic features with high and low chroma in these and other hues. Texture in individual subhorizons ranges from loam or sandy clay loam to sandy loam in the fine-earth fraction. Structure is weak to moderate, fine to coarse subangular blocky. Consistence is friable.

The Bx horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 4 through 6. It has high and low chroma redoximorphic features in these and other hues. Redoximorphic features are commonly concentrated along vertically oriented streaks in vertical sections and polygonal patterns in horizontal sections. Structure is weak or moderate thick or very thick platy, weak very coarse prismatic, subangular blocky, or the horizon is massive. Consistence is firm or very firm.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 2 through 8, or it is mottled with these and other hues. Texture is commonly loamy sand or sandy loam in the fine-earth fraction but the range includes sandy clay loam, clay loam, or silty clay loam in some pedons.

COMPETING SERIES: There are no other series currently in the same family.

GEOGRAPHIC SETTING: Hibernia soils are on nearly level to moderately steep ground moraines, at the base of steeper sloping uplands, and in shallow concave drainageways. Slope ranges from 0 to 25 percent. The soils developed in coarse textured till and colluvium derived primarily from granitic gneiss with small amounts of quartzite, sandstone and shale. The mean annual precipitation ranges from 40 to 50 inches. The mean annual temperature ranges from 45 to 52 degrees F. The frost-free days range from 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Netcong, Rockaway, Ridgebury, and Riverhead soils on nearby landscapes. Netcong and Rockaway soils usually occupy higher positions on the landscape. Ridgebury soils usually occupy lower positions on the landscape. Riverhead soils are typically on terraces and outwash plains in major valleys and are in stratified gravelly and sandy deposits.

DRAINAGE AND PERMEABILITY: Hibernia soils are somewhat poorly drained. Surface runoff is negligible to high. Permeability is moderate above the fragipan, slow in the fragipan, and moderate to rapid in the substratum. Saturated hydraulic conductivity is moderately low to high above the fragipan, moderately low or moderately high in the fragipan, and moderately low to very high in the substratum. A perched water table is commonly ranges within a foot of the surface in late winter and early spring and following periods of extended rainfall. Lateral seepage to the surface is common, particularly at slope breaks.

USE AND VEGETATION: Most areas are wooded or in idle fields. Natural vegetation is largely woodland dominated by oak, ash and birch with some maple and hemlock. In urban areas much of this soil has been drained or overfilled and is used for housing or industrial development.

DISTRIBUTION AND EXTENT: Northern New Jersey; MLRAs 144A and extreme northern portions of MLRA 148. The series is of moderate extent, with a total of about 30,000 acres.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Morris County, New Jersey, 1971.

REMARKS: The argillic horizon in Hibernia soils is weakly to moderately well expressed. In the same landscape with the Hibernia soils are similar pedons that have soil characteristics more closely associated with cambic horizons. Cation exchange activity class determined from a review of limited data.

Diagnostic horizons and features recognized in this pedon include:

- 1. Ochric epipedon the zone from 0 to 9 inches (A and BA horizons).
- 2. Argillic horizon the zone from 9 to 25 inches (Bt horizon).
- 3. Fragipan the firm, brittle zone from 25 to 36 inches (Bx horizon).
- 4. Aquic feature low chroma depletions are in the upper 10 inches of the argillic horizon (Bt2 horizon).

ADDITIONAL DATA: Reference samples from pedon 80P0011, samples 80P0043-0053 from Bergen County, New Jersey. Samples by NSSL, Lincoln, NE, 8/78.

# MAP SYMBOL: OtsC (Otisville gravelly loamy sand, 3-15 percent slopes), OtsD (Otisville gravelly loamy sand, 15-25 percent slopes)

SOIL SERIES: Otisville

CHARACTERISTICS: The Otisville series consists of very deep, excessively drained soils formed in outwash on Wisconsinan age terraces, kames, eskers, and beaches. Permeability is rapid in the solum and rapid or very rapid in the substratum. Slope ranges from 0 to 60 percent. Mean annual temperature is about 49 degrees F., and mean annual precipitation is about 40 inches.

TAXONOMIC CLASS: Sandy-skeletal, mixed, mesic Typic Udorthents

TYPICAL PEDON: Otisville gravelly sandy loam, in pasture. (Colors are for moist soil.)

Ap-- 0 to 6 inches; dark grayish brown (10YR 4/2) gravelly sandy loam; weak fine granular structure; very friable; many fine roots; 25 percent gravel; very strongly acid; clear smooth boundary. (3 to 10 inches thick)

Bw1-- 6 to 22 inches; yellowish brown (10YR 5/6) gravelly loamy sand; very weak very fine granular structure; very friable; few fine roots; 30 percent gravel; very strongly acid; gradual wavy boundary.

Bw2-- 22 to 28 inches; yellowish brown (10YR 5/4) very gravelly sand; single grain; loose;

40 percent gravel; very strongly acid; gradual wavy boundary. (Combined thickness of the Bw horizon is 9 to 25 inches thick.)

C-- 28 to 65 inches; grayish brown (2.5Y 5/2) very gravelly sand; single grain; loose; 45 percent gravel; strongly acid.

TYPE LOCATION: Orange County, New York; 2.5 miles west southwest of Otisville, 0.35 mile northwest of railroad crossing at Cuddebackville. USGS Otisville, NY topographic quadrangle; Latitude 41 degrees, 28 minutes, 05 seconds N. and Longitude 74 degrees, 35 minutes, 33 seconds W., NAD 1927.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 14 to 36 inches. Rock fragments mainly consist of acid siltstone and shale, with some quartz.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. In forested areas the A horizon is 1 to 3 inches thick. Texture ranges from loam to loamy sand in the fine-earth fraction. Consistence is friable or very friable. Structure is weak or moderate, very fine to medium, granular. Rock fragments range from 0 to 40 percent, and include up to 5 percent cobbles and stones. Reaction ranges from extremely acid to slightly acid. Areas that have been limed range to neutral.

The B horizon has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 8. Texture ranges from loamy fine sand to coarse sand in the fine-earth fraction. Structure is very weak or weak, very fine to coarse, granular or subangular blocky, or is single grain. Rock fragments range from 20 to 75 percent, and include up to 10 percent cobbles and stones. Reaction ranges from extremely acid to slightly acid.

The C horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 4. Texture ranges from loamy sand to coarse sand in the fine-earth fraction, and is commonly stratified. Rock fragments range from 30 to 70 percent, and include up to 15 percent cobbles and stones. Reaction ranges from very strongly acid to moderately acid.

COMPETING SERIES: These are the Bonaparte, Hinckley, Manchester, Mecosta, Multorpor, Quonset and Riker (T) series. Bonaparte soils are slightly alkaline or moderately alkaline in the substratum. Hinckley soils have rock fragments consisting of granite, gneiss and schist. Manchester soils have hues of 5YR or redder in the substratum. Mecosta soils have carbonates within a depth of 15 to 40 inches. Multorpor soils have mean annual precipitation ranging from 80 to 120 inches. Quonset soils have rock fragments consisting of phyllite, shale, slate, schist and gneiss. Riker soils have carboliths and pieces of coal or coal slag in the series control section.

GEOGRAPHIC SETTING: Otisville soils formed in Wisconsinan age outwash and are on long narrow ridges, summits, shoulders and sideslopes on terraces, kames and eskers on outwash plains, and on beaches and offshore bars on lake plains. Slope ranges from 0 to 60 percent. Mean annual temperature ranges from 45 to 52 degrees F., and mean annual precipitation ranges from 29 to 50 inches. The frost free period ranges from 135 to 200

days, and elevation ranges from 570 to 860 feet above msl.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Alton, Atherton, Chenango, Fredon, Halsey, Hinckley, Hoosic, Oakville, Plymouth and Tunkhannock series. The excessively drained Hinckley and Plymouth soils, somewhat excessively drained Alton, Chenango, Hoosic and Tunkhannock soils, and well drained Oakville soils are on similar landscape positions. The somewhat poorly drained Fredon soils, poorly drained Atherton soils, and very poorly drained Halsey soils are on lower landscape positions.

DRAINAGE AND PERMEABILITY: Excessively drained. The potential for surface runoff ranges from negligible to low. Permeability is rapid in the solum and rapid or very rapid in the substratum.

USE AND VEGETATION: The soils are mainly idle or used for pasture, hay, corn, and small grain. Limited areas are in deciduous fruit trees. Woodlots are dominated by oakhickory associations at the southern limit of the series while sugar maple and American beech are prominent near the northern limit.

DISTRIBUTION AND EXTENT: In widely scattered areas ranging from borders of the Adirondak Mountains of New York to northern New Jersey and northeastern Ohio. MLRA's 100, 101, 139, 140, 144A, and 148, The series is moderately extensive, about 28,000 acres.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Jefferson County, New York, 1911.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - from a depth of 0 to 6 inches (Ap horizon). Udic moisture regime.

### MAP SYMBOL: PHG (Pits, sand and gravel)

SOIL SERIES: None.

CHARACTERISTICS: Human alteration created the Pits, sand and gravel soil series, that identifies areas mined for sand, gravel and rock. It is difficult to characterize these soils because they have been extensively disturbed. The NRCS does not describe the limitations of these soils.

### MAP SYMBOL: PafAt (Palms muck, 0-2 percent slopes, frequently flooded)

**SOIL SERIES: Palms** 

CHARACTERISTICS: The Palms series consist of very deep, very poorly drained soils formed in herbaceous organic material 16 to 51 inches thick and the underlying loamy deposits in closed depressions on moraines, lake plains, till plains, outwash plains, and hillside seep areas, and on backswamps of flood plains. Permeability is moderately slow to moderately rapid in the organic material, and moderate or moderately slow in the loamy material. Slope ranges from 0 to 6 percent. Mean annual precipitation is about 35 inches,

and mean annual temperature is about 50 degrees F.

TAXONOMIC CLASS: Loamy, mixed, euic, mesic Terric Haplosaprists

TYPICAL PEDON: Palms muck, on 1 percent slope under marsh vegetation at an elevation of 648 feet. (Colors are for moist soil unless otherwise stated.)

Oa1--0 to 14 inches; black (10YR 2/1) broken face and rubbed muck (sapric material); about 5 percent fiber, less than 5 percent rubbed; moderate medium granular structure; slightly sticky; about 20 to 25 percent mineral material; slightly acid (pH 6.5 in water); abrupt smooth boundary.

Oa2--14 to 28 inches; black (10YR 2/1) broken face and rubbed muck (sapric material); about 5 percent fiber, less than 5 percent rubbed; massive parting to weak coarse subangular blocky structure; slightly sticky; 10 to 20 percent mineral material; strongly acid (pH 5.5 in water); clear smooth boundary.

Oa3--28 to 35 inches; black (N 2.5/0) rubbed muck (sapric material); about 5 percent fiber, less than 5 percent rubbed; massive; slightly sticky; 10 to 20 percent mineral material; moderately acid (pH 6.0 in water); abrupt smooth boundary. (Combined thickness of the Oa horizon is 16 to 51 inches.)

Cg--35 to 80 inches; gray (10YR 5/1) clay loam; massive; friable; common medium distinct dark yellowish brown (10YR 4/4) masses of iron oxide accumulation in the matrix; neutral (pH 6.8 in water) in upper part; slightly effervescent, moderately alkaline in lower part.

TYPE LOCATION: Gratiot County, Michigan; north of the flood plain of the Maple River and about 200 feet south of the upland; 1,420 feet south and 820 feet west of the northeast corner of sec. 27, T. 9 N., R. 2 W.; U.S.G.S. Pompeli topographic quadrangle; lat. 43 degrees 8 minutes 31.3 seconds N. and long. 84 degrees 31 minutes 34.7 seconds W., NAD 27; UTM Zone 16, 701165 easting and 4779557 northing, NAD 83.

RANGE IN CHARACTERISTICS: The depth to the loamy C horizon ranges from 16 to 51 inches. The organic material is derived primarily from herbaceous plants, but some layers contain as much as 15 percent woody material. Reaction of the organic material ranges from strongly acid to slightly alkaline. Some organic layers contain carbonates.

The surface tier has hue of 10YR to 5YR, or is neutral; value of 2, 2.5, or 3, and chroma of 0 to 2. It is dominantly sapric material; however, some pedons have hemic material. The subsurface and bottom tiers have hue of 10YR to 5YR, or are neutral; value of 2 to 4, and chroma of 0 to 3. Thin layers, less than 10 inches thick, of hemic material are in some pedons. Thin layers, less than 5 inches thick, of fibric material are in some pedons. Some pedons have a thin layer of sedimentary peat above the C horizon. Some pedons have a thin A horizon above the C horizon.

The C or Cg horizon has hue of 10YR to 5Y, 5GY, or is neutral; value of 3 to 7, and chroma

of 0 to 4. It is loamy very fine sand, sandy loam, fine sandy loam, loam, silt loam, silty clay loam, clay loam, or sandy clay loam, or the gravelly analogues of these textures. The upper 12 inches of this horizon averages between 10 and 35 percent clay. Some pedons contain thin strata of fine sand, loamy sand, or silt. Reaction ranges from moderately acid to moderately alkaline. Rock fragment content ranges from 0 to 25 percent and fragments range in size from gravel to stones. Some pedons contain carbonates. Sandy substratum, gravelly substratum, and overwash phases are recognized.

COMPETING SERIES: These are the Klossner, Linwood, Medo, Natchaug (T), Philbon, and Shalcar series. Similar soils are the Adrian, Carlisle, Cathro, Dawson, Edwards, Houghton, Markey, Tawas, and Willette series. Klossner soils have A horizons directly below the organic matter. Linwood soils formed mainly in woody fibers. Medo soils have less than 10 percent clay in the lower 1/3 of the series control section. Natchaug soils are in areas where the mean annual precipitation is greater than 43 inches. Philbon soils have fibric and hemic material in the upper 12 inches. Shalcar soils have a difference between mean annual summer and mean annual winter temperatures that is less than 26 degrees F. Adrian, Dawson, Markey, and Tawas soils have sandy mineral layers at depths of 16 to 51 inches. In addition, the Dawson, Markey, and Tawas soils have frigid soil temperatures. Carlisle and Houghton soils formed in organic deposits more than 51 inches thick. Cathro soils have frigid soil temperatures. Edwards soils are underlain by marl at depths of 16 to 51 inches. Willette soils have mineral layers that average more than 35 percent clay at depths of 16 to 51 inches.

GEOGRAPHIC SETTING: Palms soils formed herbaceous organic material and the underlying loamy deposits and are in closed depressions on lake plains, till plains, outwash plains, moraines, and hillside seep areas, and on backswamps of flood plains. Slope gradients range from 0 to 6 percent. The soils on nearby uplands are generally loamy. Mean annual temperature ranges from 48 to 53 degrees F., mean annual precipitation ranges from about 30 to 43 inches, frost-free period ranges from 120 to 180 days, and elevation ranges from 580 to 1,530 feet above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: The Houghton soils are the most common associate and are on similar landform positions. Poorly drained or very poorly drained loamy mineral soils are at the edges of the bogs and are adjacent to Palms soils.

DRAINAGE AND PERMEABILITY: Very poorly drained. The potential runoff for surface runoff is negligible. Permeability is moderately slow to moderately rapid in the organic material, and moderate or moderately slow in the loamy material. The depth to the top of an apparent seasonal high water table ranges from 1 foot above the surface to 1 foot below the surface from November to May in normal years.

USE AND VEGETATION: Most areas of this soil are in marsh vegetation of grasses, reeds, and sedges; and alder, aspen, willow, and dogwood. Some areas have been drained and are used for pasture, corn, and some truck crops.

DISTRIBUTION AND EXTENT: MLRAs 95B, 96, 97, 98, 99, 111, and 115, and possibly

in 100, 105, 110, 114, and 120 in the southern part of the lower peninsula of Michigan, Wisconsin, northern Illinois, Indiana, Iowa, Massachusetts, Minnesota, New York, Connecticut, and other northeastern states. The soils are of large extent.

MLRA OFFICE RESPONSIBLE: Indianapolis, Indiana.

SERIES ESTABLISHED: Sanilac County, Michigan; 1955.

REMARKS: Diagnostic horizons and features recognized in this pedon are: organic material from the surface to 35 inches (Oa1, Oa2, and Oa3 horizons); mineral material at depths from 35 to 80 inches - Terric subgroup.

ADDITIONAL DATA: Lab characterization data is available from the National Soil Survey Laboratory, Lincoln, NE. Transect data (T98MI-057-004) for the typical pedon is on file in MLRA project office, Plymouth, Indiana. Transect shows 70 percent Palms soils and 30 percent Houghton soils.

### MAP SYMBOL: PawE (Parker-Rock outcrop complex, 25-45 percent slopes)

SOIL SERIES: Parker

CHARACTERISTICS: The Parker series consists of very deep, somewhat excessively drained soils that formed in residuum derived from granitic gneiss bedrock. They occur on gently sloping to very steep slopes of ridges and hills. Slopes range from 3 to 70 percent.

TAXONOMIC CLASS: Loamy-skeletal, mixed, semiactive, mesic Typic Dystrudepts

TYPICAL PEDON: Parker very gravelly sandy loam, on a 24 percent slope, wooded. (Colors are for moist soil.)

O--3 to 0 inches; undecomposed tree leaves and twigs from oak, yellow poplar and ash. (0 to 8 inches thick)

Oe--0 to 7 inches; black (10YR 2/1) partially decomposed organic matter in spaces between angular stones, gravel and cobbles; strongly acid. (0 to 7 inches thick)

A--7 to 12 inches; dark brown (7.5YR 3/2) very gravelly sandy loam; strong coarse granular structure; friable; many fine and few large roots; 50 percent angular stones, cobbles and gravel; strongly acid; abrupt irregular boundary. (2 to 8 inches thick)

Bw1--12 to 27 inches; brown (7.5YR 4/4) very gravelly loam; moderate coarse granular structure; very friable; few fine and many large roots; 50 percent angular gravel, cobbles and stones; strongly acid; diffuse irregular boundary.

Bw2--27 to 38 inches; dark yellowish brown (10YR 4/4) very gravelly sandy loam; moderate coarse granular and moderate fine subangular blocky structure; very friable; few fine and large roots; 50 percent angular stones, cobbles and gravel; very strongly acid; diffuse irregular boundary. (combined thickness of the Bw horizons is 15 to 35 inches)

C--38 to 72 inches; yellowish brown (10YR 5/4) extremely gravelly sandy loam; weak coarse granular structure; very friable; few fine roots; 60 percent angular stones, cobbles and gravel, mostly hard and unweathered; very strongly acid.

TYPE LOCATION: Morris Township, Morris County, New Jersey; 870 feet north of Hanover Avenue across the road from junction with Raynor Road; USGS Mendham, NJ topographic quadrangle; approximate coordinates lat. 40 degrees 50 minutes 06 seconds N and 74 degrees 31 minutes 24 seconds W, NAD83.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 20 to 40 inches. Depth to solid bedrock ranges from 5 to 10 feet or more. Rock fragments range from 35 to 70 percent by volume through the solum and 60 to 90 percent in the C horizon. Rock fragment sizes commonly range from gravel through stones but individual pedons are dominated by either gravel, cobbles or stone fragments. Rock fragments on the soil surface range to extremely stony. The silt and sand fractions are dominated by quartz, feldspar and various ferromagnesium minerals derived from granitic gneiss or similar rocks. The soil usually contains very small amounts of mica. The fine-earth fraction of the control section typically has 10 to 18 percent clay. Texture of the fine-earth fraction throughout the solum and substratum is loam or sandy loam. Some pedons have a few faint clay films on faces of peds and in voids and bridging between sand grains. The soil is very strongly acid or strongly acid unless limed.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 1 through 4. It commonly has moderate or strong, medium or coarse granular structure.

Some pedons have an E horizon that has hue of 7.5YR or 10YR, value of 2 through 6, and chroma of 1 through 6.

The B horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 6. The abundant rock fragments interrupt structure, but the fine-earth fraction has moderate, medium and coarse granular or weak, fine or medium subangular blocky structure.

The C horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 6. Color patterns appear to be related to differential weathering of the banded gneiss (or related types) bedrock. Some pedons have a Cr horizon below 60 inches.

COMPETING SERIES: The are the Bremo, Cardiff, Greenlee, Griffinsburg (T), Handshoe, Konnarock, Northcove, Watt, and Wriston (T) series. Bremo soils are moderately deep to hard bedrock and have rock fragments consisting of hornblende schist, gneiss, quartz, feldspar crystals, or greenstone. Cardiff soils are deep to hard, fine-grained metamorphic bedrock and have rock fragments consisting of fine-grained metamorphic rocks such as slate or phyllite. Greenlee soils generally occur at elevations between 1500 and 3500 feet in the Southern Appalachian Mountains and developed in colluvium. Griffinsburg (T) and Konnarock soils are moderately deep to hard bedrock. Handshoe soils have rock fragments dominated by sandstone and formed in colluvium. Northcove soils generally occur at elevations between 1200 and 3800 feet in the Southern Appalachian Mountains and

developed in colluvium derived from low-grade metasedimentary rocks such as quartzite, phyllite, slate, metagraywacke and metasandstone. Watt soils are moderately deep to hard graphitic bedrock. Wriston (T) soils are moderately deep to hard sedimentary bedrock and have rock fragments consisting of finer-grained sedimentary rocks such as shale, siltstone or fine-grained sandstone.

GEOGRAPHIC SETTING: Parker soils formed in residuum derived from granitic gneiss bedrock. They are on ridges and hills in the uplands. Slopes of 15 percent are common but the range extends from 3 to 70 percent. The mean annual temperature ranges from 45 to 55 degrees F.; mean annual precipitation ranges from 40 to 48 inches; and the frost-free season ranges from 150 to 190 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Annandale, Califon, Edneyville and Washington soils. Annandale, Edneyville and Washington soils have argillic horizons and less rock fragments throughout. Califon soils have redoximorphic features in the subsoil and substratum, have fragipans, and are at lower elevations in the landscape.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained. Moderately rapid permeability. Index Surface Runoff class ranges from very low to medium.

USE AND VEGETATION: Less than half of the Parker soils are cleared of trees and stones for growing crops. Most cleared areas are idle for a number of years and are in various stages of second growth forest dominantly of dogwood and red cedar. On Parker soils which have not been cleared but have been repeatedly logged, the vegetation is the oak-hickory forest.

DISTRIBUTION AND EXTENT: New Jersey and Virginia. The series is of moderate extent, with approximately 85,000 acres identified.

MLRA OFFICE RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Upper Raritan River area, New Jersey, 1938.

REMARKS: The 11/2005 revision places Parker in a semiactive CEC activity class. This placement is based on the similar Gladstone series which has laboratory data for three pedons, all within the semiactive class.

Diagnostic horizons recognize in this pedon are:

- a. Ochric epipedon, the portion from 3 inches above the soil surface to 12 inches below the soil surface. (Oi, Oe, and A horizons)
- b. Cambic horizon, the part from 12 to 38 inches. (Bw1 and Bw2 horizons)

ADDITIONAL DATA: CEC class placement based on lab data from the related Gladstone series. Three Gladstone pedons from Hunterdon and Warren Counties have semiactive activity class.

## MAP SYMBOL: PbphAt (Parsippany silt loam, sandy loam substratum, 0-3 percent slopes)

SOIL SERIES: Parsippany

CHARACTERISTICS: The Parsippany series consists of deep, poorly drained soils in extinct lake basins and near streams. They formed in silty and clayey sediments. Slope ranges from 0 to 8 percent. Permeability is moderate in the surface horizons, slow or very slow in the subsoil and moderately rapid to very slow in the substratum. Parsippany soils are subject to seasonal flooding. Mean annual temperature is about 50 degrees F. and mean annual precipitation is about 46 inches.

TAXONOMIC CLASS: Fine, mixed, active, mesic Aeric Endoaqualfs

TYPICAL PEDON: Parsippany silt loam - in woodland at an elevation of about 235 feet. (Colors are for moist soil.)

A--0 to 2 inches; very dark grayish brown (10YR 3/2) silt loam; weak very fine granular structure; friable, slightly sticky, nonplastic; many fibrous and few medium and coarse roots; strongly acid; clear wavy boundary. (1 to 7 inches thick)

ABg--2 to 4 inches; dark gray (10YR 4/1) silt loam; moderate medium and fine subangular blocky structure; friable, slightly sticky, nonplastic; common fine and medium roots; many silt and sand grains stained with very dark grayish brown (10YR 3/2); very strongly acid; gradual wavy boundary. (0 to 6 inches thick)

Bg--4 to 9 inches; gray (10YR 6/1) silty clay loam; moderate medium subangular blocky structure; firm, slightly sticky, plastic; many medium and fine roots; few vertically oriented gray streaks; sand and silt grains stained or coated; many coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation and common fine faint dark gray (10YR 4/1) iron depletions; very strongly acid; gradual wavy boundary. (0 to 10 inches thick)

Btg1--9 to 18 inches; gray (5YR 5/1) silty clay; moderate medium subangular blocky structure and moderate fine angular blocky structure; firm, slightly sticky, very plastic; few fine roots; few vertically oriented gray streaks; many prominent clay films in channels and on faces of peds; many brown (7.5YR 4/4) masses of iron accumulation and many brown (7.5YR 5/2) iron depletions on faces of peds and interiors of peds; moderately acid; gradual wavy boundary. (3 to 40 inches thick)

Btg2--18 to 29 inches; reddish brown (5YR 4/4) silty clay; moderate coarse subangular blocky structure; very firm, slightly sticky, slightly plastic; few fine roots; few prominent reddish brown (5YR 4/3) clay films and few black (N 2/) stains on faces of peds; few vertically oriented gray streaks; 3 percent fine gravel composed mostly of granitic gneiss and shale; moderately acid; many coarse distinct strong brown (7.5YR 5/6) masses of iron accumulation and common coarse prominent grayish brown (10YR 5/2) iron depletions; gradual wavy boundary. (0 to 20 inches thick)

BC--29 to 50 inches; nearly equal portions of brown (7.5YR 5/4) and strong brown (7.5YR

5/6) silty clay loam; weak thick platy structure to massive in the lower part; very firm, sticky, plastic, few roots mostly in or near vertically oriented streaks; very few prominent clay films in voids and along some vertical streaks; few vertically oriented reddish brown (5YR 4/3) and brown (7.5YR 5/2) streaks; cut mass sprinkled with black or rust colored dots; slightly acid; gradual wavy boundary. (0 to 21 inches thick)

C--50 to 70 inches; reddish brown (5YR 4/3) varved silt loam with few 1/2 to 1 inch lamellae of very fine sand and silt; massive; firm; neutral.

TYPE LOCATION: Somerset County, New Jersey; 250 feet east of Dead River Road, 100 feet south of Dead River at edge of a woodlot. USGS Bernardsville quadrangle; latitude 40 degrees, 39 minutes, 4 seconds N. and longitude 74 degrees, 32 minutes, 45 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 30 to 60 inches with a lower boundary that ranges from clear to diffuse. Depth to bedrock is more than 6 feet. Coarse fragments are generally lacking but range to 5 percent in subhorizons within the solum and to 20 percent in the C horizon. Unless limed, the reaction is very strongly or strongly acid near the surface and increases with depth to slightly acid to mildly alkaline in the C horizon. Lamellae or varves are evident within the series control section.

The O horizon, where present, has hue of 7.5YR or 10YR, value of 2, and chroma of 1 or 2. In lieu texture is slightly, moderately, or highly decomposed plant material.

The A horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma 1 to 3. Ap horizons have hues of 5YR to 10YR, values of 3 to 5 moist and 6 or 7 dry, and chroma of 1 or 2. Texture is silt loam or silty clay loam. The A horizons have weak or moderate medium or fine granular or subangular blocky structure and are friable or very friable. Some pedons have strong fine granular structure.

The B horizons have hue of 5YR to 10YR, value of 4 to 6, and chroma of 1 to 6, with low chroma dominant in the upper part. Also, hues of 10YR are only in the upper part. Redoximorphic features are common or many, medium or coarse throughout the B horizon or the horizon is variegated with nearly equal proportions of two or three colors. Texture in individual subhorizons ranges from silt loam to clay but the weighted average clay content in the textural control section is more than 35 percent.

The C horizon has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 3 to 6. Redoximorphic features range from few to many and faint to distinct. Texture ranges from clay to sandy loam above 40 inches and loamy sand to silty clay below.

COMPETING SERIES: Savona is the only series currently in the same family. Savona soils have carbonates within a depth of 36 inches.

The Aden, Crosby, Jeddo, Library, McGary, Pyrmont, and Randolph series are in related families. Aden soils lack lamella in the control section. Crosby soils have carbonates within

a depth of 36 inches. Jeddo and Library soils lack stratification within the series control section. McGary soils have hues of 10YR throughout the soil. Pyrmont soils have carbonates within depths of 18 inches. Randolph soils have bedrock within depths of 40 inches.

GEOGRAPHIC SETTING: Parsippany soils are nearly level to gently sloping and generally within large basins. Slope is 0 to 8 percent. These soils formed in silty and clayey sediments containing a high proportion of fines derived from weathered basalt, shale and granitic materials. The climate is humid temperate. Average annual precipitation is 40 to 48 inches and the growing season is about 140 to 170 days. Mean annual temperature is about 45 to 50 degrees F.

GEOGRAPHICALLY ASSOCIATED SOILS: These are Preakness and Whippany soils on nearby landscapes. Preakness soils are moderately coarse or coarse textured throughout the soil and Whippany soils are the moderately well and somewhat poorly drained members of the drainage sequence that includes Parsippany.

DRAINAGE AND PERMEABILITY: Poorly drained. Surface runoff is negligible to high. Permeability is moderate in the surface horizons, slow or very slow in the subsoil and moderately rapid to very slow in the substratum. Saturated hydraulic conductivity is moderately low to high in the surface horizons and low to moderately high in the subsoil and low to high in the substratum. The water level is at or near the surface throughout the winter and early spring and following periods of heavy rainfall. Flooding is none to frequent and occurs in most areas of Parsippany soils but particularly adjacent to major streams.

USE AND VEGETATION: A small portion is used for crops, hay and pasture, but most Parsippany soils are in woodland. Originally swamp white oak, elm, ash, and swamp maple grew on these soils.

DISTRIBUTION AND EXTENT: New Jersey Triassic lowlands, possibly in Pennsylvania and southern New York, mainly found in glaciated and periglacial areas; MLRAs 144A and 148. This series is of moderate extent with a total of about 32,000 acres.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Morris County, New Jersey, 1971.

REMARKS: Limited data is inconclusive but suggests that these soils have mixed clay mineralogy. Cation exchange activity class determined from a review of similar soils.

Diagnostic horizons and features recognized in this pedon include:

- 1. Ochric epipedon the zone between 0 and 9 inches (A, ABg, and Bg horizons)
- 2. Argillic horizon the zone between 9 and 29 inches (Btg1 and Btg2 horizons) with a clay average of more than 35 percent (fine)
- 3. Aquic moisture regime redoximorphic features with chroma of 2 or less immediately

below the dark A horizon at 4 to 9 inches (Bg horizon) and dominant chroma of 1 or less in the argillic horizon of 9 to 29 inches (Btg1 and Btg2 horizons)

4. Aeric Subgroup - the hue is 5 or less and the chroma is 2 or more within 75 cm of the surface in the zone of 18 to 29 inches (Btg2 horizon).

## MAP SYMBOL: PohA (Pompton sandy loam, 0-3 percent slopes), PohB (Pompton sandy loam, 3-8 percent slopes)

SOIL SERIES: Pompton

CHARACTERISTICS: The Pompton series consists of deep moderately well drained and somewhat poorly drained soils formed in water-sorted sediments. They are on outwash plains and terraces in waterways and low positions. Slope ranges from 0 to 8 percent. Permeability is moderately rapid in the solum and moderately rapid to very rapid in the substratum. Mean annual temperature is about 52 degrees F. and mean annual precipitation is about 50 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Aquic Dystrudepts

TYPICAL PEDON: Pompton very fine sandy loam - idle field. (Colors are for moist soils.)

Ap--0 to 7 inches, very dark grayish brown (10YR 3/2) very fine sandy loam; moderate medium granular structure; very friable; many roots; common fine pores; strongly acid; clear smooth boundary. (6 to 8 inches thick)

Bw1--7 to 17 inches, yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; common roots; common fine prominent yellowish brown (10YR 5/8) and strong brown (7.5YR 5/6) masses of iron accumulation; strongly acid; clear wavy boundary.

Bw2--17 to 25 inches, yellowish brown (10YR 5/4) sandy loam, weak medium subangular blocky structure; friable; common roots; common fine pores; many clean grains; common fine prominent distinct yellowish brown (10YR 5/8) and distinct strong brown (7.5YR 5/6) masses of iron accumulation and common fine distinct light brownish gray (2.5Y 6/2) iron depletions; strongly acid; clear wavy boundary. (Combined thickness of the Bw horizons is 7 to 34 inches thick)

BC--25 to 34 inches, yellowish brown (10YR 5/6), grayish brown (2.5Y 5/2) and olive gray (5Y 5/2) gravelly sandy loam; weak medium subangular blocky structure; very friable; few roots; 30 percent pebbles with few cobblestones; common fine and medium distinct strong brown (7.5YR 5/6) and yellowish red (5YR 4/6) masses of iron accumulation; strongly acid; gradual wavy boundary. (0 to 15 inches thick)

2C--34 to 48 inches, yellowish brown (10YR 5/4) and light olive brown (2.5Y 5/4) stratified very gravelly loamy sand; single grain; loose; 45 percent pebbles and cobblestones; strongly acid; clear wavy boundary. (6 to 18 inches thick)

3C--48 to 72 inches, grayish brown (2.5Y 5/2) and light brownish gray (10YR 6/2) stratified sand and gravel; single grain; loose; strongly acid.

TYPE LOCATION: Passaic County, New Jersey, Township of West Milford; in idle field at a point 520 feet northeast of intersection of Cross Road and New Jersey State Route 23. USGS Newfoundland quadrangle; latitude 41 degrees, 3 minutes, 14 seconds N, longitude 74 degrees, 26 minutes, 38 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 24 to 40 inches. Rock fragments range from 0 to 35 percent through the solum and from 0 to 75 percent in individual horizons in the C horizon. The particle-size control section averages less than 35 percent coarse fragments. Rounded pebbles are dominant but angular pebbles and rounded or angular cobblestones and stones also occur. Rock fragments are primarily composed of granitic gneiss with lesser amounts of sandstone, shale and quartzite. Mineralogy is dominated by quartz, feldspars, and micas, with lesser amounts of dark opaque minerals. Depth to low chroma iron depletions ranges from 15 to 24 inches. Reaction is very strongly acid to moderately acid throughout unless limed.

The A horizons have hues of 7.5YR or 10YR, values of 3 or 4 and chroma of 2 or 3. They are sandy loam to silt loam and gravelly analogues. They have weak to moderate fine or medium granular structure and are friable to very friable. Uncultivated areas have A horizons 1 to 5 inches thick.

A BA horizon up to 6 inches thick is present in some pedons. The B horizons have hues of 7.5YR to 2.5Y, values of 4 to 6 and chroma of 3 to 6. Some pedons have chroma 2 in the lower part of the B. They have yellowish red (5YR 5/6) to yellowish brown (10YR 5/8) and gray (10YR 6/1) to olive (5Y 4/3) redoximorphic features. The BA and Bw horizons are fine sandy loam, sandy loam or gravelly or cobbly analogues and the BC horizons are sandy loam, loamy sand or gravelly or cobbly analogues. The B horizons have fine or medium subangular blocky to moderate subangular blocky or granular structure. They are friable to very friable.

The C horizons have hues of 7.5YR to 5Y, values of 4 to 6 and chroma of 2 to 6. They are stratified and texture ranges from sand to sandy loam or gravelly and cobbly analogues. The transition zone between contrasting textures is more than 5 inches thick.

COMPETING SERIES: These are the Chautauqua, Pittstown, Rainbow, Sutton, Wapping, Wilbraham, and Woodbridge series. Chautauqua and Wapping soils have more than 60 percent silt plus very fine sand in the subsoil. Pittstown, Rainbow, Wilbraham, and Woodbridge soils have a densic contact. Sutton spoils do not have a lithologic discontinuity.

GEOGRAPHIC SETTING: Pompton soils are nearly level to sloping soils on broad outwash plains deltaic deposits and in slightly concave drainageways that dissect outwash terraces. Slope ranges from 0 to 8 percent, but are commonly 0 to 5 percent. The soils developed in water sorted sandy and gravelly materials dominated by granitic gneiss with lesser amounts of many other kinds of materials. The mean annual precipitation ranges from

40 to 50 inches. Mean annual temperature ranges from 45 to 52 degrees F. The frost-free days range from 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Boonton, Haledon, Preakness, Riverhead, and Rockaway soils on nearby landscapes. Riverhead soils are well drained and Preakness soils are poorly drained. Boonton, Haledon and Rockaway soils are on uplands.

DRAINAGE AND PERMEABILITY: Moderately well drained and somewhat poorly drained. Permeability is moderately rapid in the solum and rapid or very rapid in the substratum. Saturated hydraulic conductivity is high in the solum and high or very high in the substratum. Surface runoff is very low or low. The ground water table is within 12 inches of the surface in the late winter and early spring and following periods of extended rainfall.

USE AND VEGETATION: Most areas are wooded or in idle fields and used for residential or industrial development sites. Native vegetation is largely in woodland dominated by birch, oak, and ash with some hemlock.

DISTRIBUTION AND EXTENT: Northern New Jersey, New York and Massachusetts; MLRA 144A. The series is of moderate extent with approximately 14,000 acres, (10,000 in New Jersey).

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Morris County, New Jersey, 1971.

REMARKS: Cation exchange activity class was determined from a review of available data and/or similar soils.

Diagnostic horizons and features recognized in this pedon include:

- 1. Cambic horizon from 7 to 34 inches (Bw1, Bw2, and BC horizons).
- 2. Aguic feature low chroma iron depletions from 17 to 25 inches (Bw2 horizon).

# MAP SYMBOL: PrkAt (Preakness sandy loam, 0-3 percent slopes, frequently flooded), PrsdAt (Preakness dark surface variant sandy loam, 0-3 percent slopes, frequently flooded)

**SOIL SERIES: Preakness** 

CHARACTERISTICS: The Preakness series consists of very deep, poorly and very poorly drained soils on outwash plains and terraces. They occur in low positions and in swales. Slope ranges from 0 to 3 percent. Permeability is moderate or moderately rapid in the surface and subsoil and rapid or very rapid in the substratum. Mean annual temperature is about 47 degrees F., and mean annual precipitation is about 48 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, acid, mesic Typic Humaquepts

TYPICAL PEDON: Preakness sandy loam - old field. (Colors are for moist soil unless otherwise stated.)

Ap--0 to 8 inches; very dark gray (10YR 3/1) sandy loam, gray (10YR 5/1) dry, crushed; moderate medium granular structure; friable; less than 5 percent fine gravel; slightly acid; clear smooth boundary. (6 to 10 inches thick)

A2--8 to 12 inches; very dark gray (N 3/0) sandy loam, gray (N 5/0) dry, crushed; moderate medium granular structure and weak fine platy at top; friable; few fine gravel; many coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation; moderately acid; clear wavy boundary. (0 to 6 inches thick)

Bg--12 to 30 inches; grayish brown (2.5Y 5/2) sandy loam; very weak fine granular structure; very friable; 10 percent rounded fine gravel; many coarse distinct gray (10YR 6/1) iron depletions; strongly acid; gradual wavy boundary. (12 to 24 inches thick)

2Cg--30 to 65 inches; grayish brown (2.5Y 5/2) gravelly loamy sand; single grain; 20 percent rounded fine granitic gravel; strongly acid; abrupt smooth boundary.

TYPE LOCATION: Morris County, New Jersey; nearly level idle field on a sandy outwash plain 1/4 mile east of Comly Road, north side of right-of-way for Interstate Highway 287.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 20 to 36 inches. Depth to bedrock is more than 6 feet. Rock fragments, sand, and silt are derived mainly from granitic gneiss and are composed of quartz, feldspar, amphibole and mica with minor amounts of sandstone, shale, quartzite and conglomerate. There are 0 to 20 percent cobbles or gravel through the solum and 0 to 70 percent in individual strata of the C horizon with a weighted average of less than 35 percent rock fragments in the textural control section. Reaction is strongly or very strongly acid unless limed, and ranges to moderately acid in the lower part of the substratum.

The O horizon, where present, has hue of 7.5YR or 10YR, value of 2, and chroma of 1 or 2. Texture is peat, mucky peat, or muck where the surface is histic. In lieu texture is slightly to highly decomposed plant material.

The Ap or A1 horizon is neutral or has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 0 through 2. The A2 horizon commonly has the same hue and chroma as the Ap or A1 horizon, but value is 3 or 4. Texture of the A and Ap horizons ranges from sandy loam to silt loam in the fine-earth fraction, with more than 30 percent sand. Structure is moderate or strong, medium or fine granular and ranges to weak platy in the lower part of the A horizon of many pedons.

The B horizon is neutral or has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 0 through 2. Texture of the fine-earth fraction is fine sandy loam or sandy loam in the upper part of the B horizon, and is sandy loam, loamy fine sand, or loamy sand at depths of about 25 inches or more. Structure is weak, very weak, or moderate fine granular

or blocky.

Some pedons have a BC horizon up to 10 inches thick. Colors and textures have the same range as the lower part of the B horizon.

The C or 2C horizon is neutral or has hue of 5YR through 5Y or 5GY, value of 4 through 7, and chroma of 0 through 4. Texture is fine sand, loam, loamy fine sand, loamy sand, sand, or sandy loam in the fine-earth fraction. Very gravelly strata are in some pedons above 40 inches.

COMPETING SERIES: There are no other series currently in the same family.

Soils in related families include the Cook, Halsey, Lickdale, Lyons, Rutlege, Scarboro, Wareham and Whately series. Except for Rutlege, none of these soils have an umbric epipedon. Rutlege soils have a sandy textural control section and mean annual soil temperature of more than 59 degrees F.

GEOGRAPHIC SETTING: Preakness soils are on broad, nearly level outwash plains or in narrow swales that dissect outwash terraces. The soils formed in stratified coarse textured materials dominantly from granitic rocks with minor amounts or other materials. Climate is temperate and humid; mean annual temperature ranges from 45 to 50 degrees F.; mean annual precipitation ranges from 40 to 48 inches and is usually well distributed throughout the year.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Adrian, Parsippany, Pompton, and Riverhead soils on nearby landscapes. Adrian soils have organic soil materials 16 to 50 inches thick. Parsippany soils have a fine textural control section. Pompton soils are somewhat poorly drained and are on slightly higher landscape positions. Walpole soils have a sandy textural control section.

DRAINAGE AND PERMEABILITY: Preakness soils are poorly or very poorly drained. Runoff is negligible or low. Permeability is moderate or moderately rapid in the surface and subsoil and rapid or very rapid in the substratum. Saturated hydraulic conductivity is moderately low or high in the surface and subsoil and moderately low to very high in the substratum. The water table is at or near the surface from late autumn through winter and spring. The soils are often ponded in winter and during periods of high rainfall because of their low topographic position. In many places adjacent to streams, Preakness soils flood frequently for brief periods in late winter and early spring. They flood more extensively but less often following severe storms of low frequency in August through October.

USE AND VEGETATION: Many areas of these soils are idle or are drained and used for housing developments. In the past, many areas had been drained and used for production of vegetables. Native vegetation is red maple, elm, willow, and ash with some sedge and other hydrophytic species.

DISTRIBUTION AND EXTENT: Northeastern New Jersey; MLRA 144A. The series is of

moderate extent.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Morris County, New Jersey, 1971.

REMARKS: Diagnostic horizons and other features recognized in this pedon are:

- 1. Umbric epipedon the zone from the surface to a depth of 12 inches (Ap and A horizons).
- 2. Cambic horizon the zone from 12 to 30 inches (Bg horizon).

MAP SYMBOL: RNRE (Rock outcrop—Rockaway complex, 15-35 percent slopes), RobCb (Rockaway sandy loam, 8-15 percent slopes, very stony), RobDc (Rockaway sandy loam, 15-25 percent slopes, extremely stony), RomC (Rockaway –Rock outcrop complex, 8-15 percent slopes), RomD (Rockaway –Rock outcrop complex, 15-25 percent slopes)

SOIL SERIES: Rockaway

CHARACTERISTICS: The Rockaway series consists of very deep well or moderately well drained soils. They are moderately deep to a fragipan. The soils formed in till on uplands. Slope ranges from 3 to 60 percent. Permeability is moderately rapid or moderate above the fragipan and slow or very slow in the fragipan. Mean annual temperature is about 52 degrees F. and mean annual precipitation is about 50 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, semiactive, mesic Typic Fragiudults

TYPICAL PEDON: Rockaway gravelly sandy loam - wooded. (Colors are for moist soil.)

A--0 to 4 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam; weak medium granular structure; very friable; many roots; common fine vesicular pores; very dark gray to black stains on most rock fragments, sand grains and surfaces of peds; 25 percent stones, cobbles and gravel; very strongly acid; clear wavy boundary. (1 to 4 inches thick)

Bt1--4 to 9 inches; yellowish brown (10YR 5/6) gravelly loam; weak fine subangular blocky structure; friable; common roots; common fine vesicular pores; many sand grains stained; few faint silt and clay coats on faces of peds and on rock fragments; discontinuous silt and very fine sand coatings in pores; 20 percent stones, cobbles, and gravel in equal proportions; strongly acid; gradual wavy boundary.

Bt2--9 to 22 inches; yellowish brown (10YR 5/6) gravelly loam; moderate medium subangular blocky structure; friable; common fine vesicular pores; few distinct clay films on faces of peds, in sand and gravel niches, and in pores; 20 percent gravel and cobbles with a few stones; strongly acid; abrupt smooth boundary. (Combined thickness of the Bt horizons is 8 to 30 inches.)

Bx--22 to 38 inches; yellowish brown (10YR 5/4) gravelly sandy loam; moderate thick platy structure; very firm, brittle; few very fine vesicular pores; common distinct clay films

on surfaces of peds; few fine black (10YR 2/1) stains on surfaces of peds; 25 percent rock fragments of mostly gravel and cobbles and a few stones; common fine and medium faint strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6 and 10YR 5/8) masses of iron accumulation, and common fine and medium faint pale brown (10YR 6/3) iron depletions; strongly acid; gradual wavy boundary. (12 to 36 inches thick)

C1--38 to 56 inches; pale brown (10YR 6/3), light brownish gray (2.5Y 6/2), and light olive brown (2.5Y 5/4) gravelly sandy loam; faint olive yellow (2.5Y 6/6) and yellowish brown (10YR 5/4) variegation that fades into matrix colors; massive; firm, weakly brittle when dry; few very fine vesicular pores; 25 percent rock fragments of mostly gravel and cobbles with a few stones; strongly acid; clear wavy boundary. (0 to 30 inches thick)

C2--56 to 72 inches; pale brown (10YR 6/3), light brownish gray (2.5Y 6/2), and light olive brown (2.5Y 5/4) very gravelly loamy sand; massive; very friable; 40 percent rock fragments of mostly gravel and cobbles with a few stones; strongly acid.

TYPE LOCATION: Passaic County, New Jersey; Township of West Milford, 10 feet east of new unimproved dirt road, 0.8 mile north of junction with Stonetown Road. Junction is 425 feet west of intersection of Stonetown Road and Greenwood Lake Turnpike. USGS Greenwood Lake quadrangle, lat. 41 degrees 7 minutes 35 seconds N. and long. 74 degrees 18 minutes 15 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 30 to 50 inches. Depth to bedrock is typically greater than 6 feet. Depth to the fragipan is 18 to 40 inches and the thickness ranges from 12 to 36 inches. Rock fragments range from 5 to 40 percent by volume in the solum and from 25 to 65 percent in the C horizon. They range from gravel to boulders in size. In some cultivated areas surface stones and boulders have been removed. Mineralogy is dominated by quartz and feldspars with some mica and ferromagnesian minerals. Reaction is strongly acid or very strongly acid throughout, except where limed.

Some pedons have O horizons.

The Ap or A horizon is neutral or has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 0 to 4. Texture ranges from sandy loam to loam in the fine-earth fraction. Structure ranges from weak or moderate, fine or medium granular to weak fine or medium subangular blocky.

Some pedons have an E horizon that has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 6. Texture and structure have the same range as the A horizon.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. Texture ranges from loam to sandy loam in the fine-earth fraction. Structure is weak to strong fine to coarse subangular blocky. Consistence is friable.

The Bx horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 6. Color variegation or redoximorphic features of brown, olive or gray are common. Texture ranges

from loam to sandy loam in the fine-earth fraction. The Bx horizon commonly has weak to strong thick platy or weak or moderate very coarse prismatic structure but in some pedons it is massive or has moderate medium subangular blocky structure. Consistence is firm or very firm. It is commonly brittle or semi-deformable.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 8, or it is mottled with these and other hues. Texture is sandy loam or loamy sand in the fine-earth fraction. Consistence is friable to loose. The C horizon may be slightly or moderately hard when dry.

COMPETING SERIES: There are no other series in the same family.

Soils in related families are the Annandale, Bartley, Hibernia, Netcong, Swartswood, Troy, and Woodbridge series. Annandale, Bartley, and Troy soils have fine-loamy textural control sections. Hibernia soils have low chroma iron depletions within the upper 10 inches of the argillic horizon. Netcong soils do not have a fragipan. Swartswood and Woodbridge soils have a cambic horizon.

GEOGRAPHIC SETTING: Rockaway soils are on complex hilly to mountainous glaciated topography. Slope ranges from 3 to 60 percent, but commonly is 8 to 25 percent. The soils developed in coarse or moderately coarse textured till composed primarily of granitic gneiss with smaller amounts of quartzite, sandstone, and shale, and in some pedons, limestone. Mean annual temperature ranges form 45 to 52 degrees F. and mean annual precipitation ranges from 44 to 54 inches. Frost-free period ranges from 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Chatfield, Hibernia, Hollis, Netcong, Ridgebury and Riverhead soils on nearby landscapes. Rockaway, Hibernia, and Ridgebury soils form a drainage sequence and formed in similar materials. Hibernia soils are somewhat poorly drained and are on lower landscape positions. Ridgebury soils are poorly drained and typically are on the lowest positions on the landscape. Chatfield and Hollis soils are moderately deep and shallow to bedrock and are on summits. Riverhead soils are on glacial outwash terraces and have porous stratified substrata.

DRAINAGE AND PERMEABILITY: Rockaway soils are commonly moderately well drained but the range includes well drained. They have moderately rapid or moderate permeability above the fragipan, slow to very slow permeability within the fragipan, and moderately rapid or rapid permeability below the fragipan. Saturated hydraulic conductivity is moderately low to high above the fragipan, moderately low to very low in the fragipan, and moderately high or high below the fragipan. Surface runoff is medium or high. A perched water table on the fragipan is common in late winter and early spring and following periods of extended rainfall.

USE AND VEGETATION: Most areas are wooded or in idle fields but some areas are used for residential or industrial development. Natural vegetation is largely woodland dominated by oak, ash, and hickory with some maple, birch, and hemlock.

DISTRIBUTION AND EXTENT: Glaciated uplands in Northern New Jersey; MLRA

144A. The series is of moderate extent.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Orange County, (Black Rock Forest Area) New York, 1939.

REMARKS: Cation exchange activity class was determined from a review of limited available data.

Diagnostic horizons and other features recognized in this pedon include:

- 1. Ochric epipedon from 0 to 4 inches (A horizon).
- 2. Argillic horizon from 4 to 22 inches (Bt horizon).
- 3. Fragipan from 22 to 38 inches (Bx horizon).

ADDITIONAL DATA: Characterization data from sample 80P0012, samples 80P0054-0063 from Bergen County, New Jersey; samples by NSSL, Lincoln, NE August, 1978.

## MAP SYMBOL: RkgBc (Ridgebury loam, 0-8 percent slopes, extremely stony)

SOIL SERIES: Ridgebury

CHARACTERISTICS: The Ridgebury series consists of very deep, somewhat poorly and poorly drained soils formed in till derived mainly from granite, gneiss and schist. They are commonly shallow to a densic contact. They are nearly level to gently sloping soils in low areas in uplands. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity ranges from moderately low to high in the solum and very low to moderately low in the substratum. Mean annual temperature is about 49 degrees F. and the mean annual precipitation is about 45 inches.

TAXONOMIC CLASS: Loamy, mixed, active, acid, mesic, shallow Aeric Endoaquepts

TYPICAL PEDON: Ridgebury sandy loam - on a 3 to 8 percent slope in an extremely stony wooded area at an elevation of about 1095 feet. (Colors are for moist soil.)

A--0 to 5 inches (0 to 12 cm.); black (N 2/0) fine sandy loam; weak medium and coarse granular structure; friable; many very fine, fine and medium tree roots; 5 percent gravel and 5 percent cobbles; very strongly acid; abrupt smooth boundary. (2 to 10 inches thick)

Bw--5 to 9 inches (12 to 22 cm.); brown (10YR 4/3) sandy loam; weak medium subangular blocky structure; friable; few fine tree roots; 5 percent gravel and 5 percent cobbles; very strongly acid; abrupt wavy boundary. (3 to 9 inches thick)

Bg--9 to 18 inches (22 to 46 cm.); dark gray (10YR 4/1) gravelly sandy loam; massive; friable; 10 percent gravel and 5 percent cobbles; common fine prominent yellowish brown (10YR 5/6) and common medium distinct reddish brown (5YR 4/4) masses of iron accumulation; very strongly acid; gradual wavy boundary. (4 to 17 inches thick)

Cd--18 to 65 inches (46 to 165 cm.); gray (5Y 5/1) gravelly sandy loam; massive; firm; 10 percent gravel and 5 percent cobbles; common fine prominent reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid.

TYPE LOCATION: Hampshire County, Massachusetts; Town of Pelham; 1,600 feet east of Route 202 at a point 3,950 feet south of its junction with Amherst Road; USGS Shutesbury quadrangle; latitude 42 degrees 22 minutes 53 seconds N. and longitude 72 degrees 23 minutes 45 second W., NAD 27.

RANGE IN CHARACTERISTICS: Depth to the dense till commonly is 14 to 19 inches. The A horizon has 5 to 25 percent gravel, 0 to 10 percent cobbles, and 0 to 25 percent stones by volume. The B and C horizons have 5 to 25 percent gravel, 0 to 5 percent cobbles and 0 to 5 percent stones. Rock fragments within the soil range from 5 to 35 percent by volume and are subangular fragments. The unlimed soil ranges from very strongly acid through moderately acid but some horizon within a depth of 40 inches is moderately acid.

The O horizon, where present, has hue of 7.5YR to 2.5Y, value of 2, 2.5, or 3 and chroma of 0 to 2.

The A or Ap horizon is neutral or has hue of l0YR to 5Y, value of 2, 2.5, or 3 and chroma of 0 to 2. Texture is sandy loam, fine sandy loam or loam in the fine-earth fraction.

Some pedons have a thin E horizon with hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. Texture is the same as the A horizon.

The B horizon is neutral or has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 0 to 3. The chroma is 4 in some places. Chroma of 3 or 4 is restricted to subhorizons. Redoximorphic features are few to many and are distinct or prominent. Texture is sandy loam, fine sandy loam, very fine sandy or loam in the fine earth fraction with fifteen percent or more fine sand or coarser and clay content less than 18 percent. The B horizon has subangular blocky structure, weak to moderate very thin to medium platy structure or is massive. It is very friable or friable.

The Cd layer has hue of l0YR to 5Y, value of 3 to 6, and chroma of l to 4. It commonly has distinct or prominent redoximorphic features which generally become less abundant with depth but the range includes faint. Texture is coarse sandy loam, sandy loam, fine sandy loam, very fine sandy or loam in the fine-earth fraction. Consistence is firm or very firm and brittle. It is massive or has plates. Any physical aggregation is considered to not be pedogenic.

Some pedons have a C horizon below the Cd that is firm but not brittle.

COMPETING SERIES: There are no series currently in the same family.

The Painesville, Punsit, and Sun series are in a closely related family. Painesville soils lack a densic contact. Punsit soils have more than 60 percent silt plus very fine sand in the

particle size control section. Sun soils formed in till derived from limestone and sandstone.

GEOGRAPHIC SETTING: The nearly level to gently sloping Ridgebury soils are in slightly concave areas and shallow drainageways of till uplands. Slope ranges from 0 to 15 percent. The soils formed in loamy till derived mainly from granite, gneiss and schist. Mean annual air temperature ranges from 45 to 52 degrees F. and mean annual precipitation ranges from 40 to 50 inches. Mean growing season ranges from 100 to 195 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These include the Charlton, Chatfield, Hollis, Leicester, Paxton and Sutton, Whitman and Woodbridge soils. Ridgebury is a member of a drainage sequence that includes the well drained Paxton, moderately well drained Woodbridge, and very poorly drained Whitman soils. Charlton and Sutton soils are better drained and have friable substrata. Chatfield and Hollis soils have bedrock within depths of 40 and 20 inches respectively. Leicester soils do not have a densic contact.

DRAINAGE AND PERMEABILITY: Commonly poorly drained but the range includes the wetter part of somewhat poorly drained. Runoff is negligible to medium. Saturated hydraulic conductivity ranges from moderately low to high in the solum and very low to moderately low in the substratum. A perched, fluctuating water table above the dense till saturates the solum to or near the surface for 7 to 9 months of the year.

USE AND VEGETATION: Largely forested to gray birch, yellow birch, red maple, hemlock, elm, spruce and balsam fir. Cleared areas are used mainly for hay and pasture.

DISTRIBUTION AND EXTENT: Glaciated landforms in Connecticut, Massachusetts, New Hampshire, New Jersey, New York, and Rhode Island. (MLRAs 142, 144A, 145, and 149B) The series is extensive.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Franklin County, Vermont, 1948.

REMARKS: An analysis of Ridgebury soils in 2002 for 38 surveys showed that this series most commonly has a densic contact at 16 to 24 inches including 8 surveys with the depth to a densic contact at 20 inches. The average depth to a densic contact was 20 inches - the data showed an almost even split between depth class occurrences. A review of characterization data for Ridgebury soils shows a very slight dominance in the acid reaction class. Any physical aggregation in the Cd is considered to not be pedogenic. The type location is currently within the officially designated mesic zone in Massachusetts.

Diagnostic horizons and features in this pedon include:

- 1. Ochric epipedon the zone from 0 to 5 inches (A horizon).
- 2. Aeric feature 100 percent of the zone from 5 to 9 inches has hue of 10YR and both color value moist of 4 and chroma moist of 3 (Bw1 horizon).
- 3. Cambic horizon the zone from 5 to 18 inches (Bw and Bg horizons).

- 3. Densic contact root limiting material begins at 18 inches (Cd).
- 4. Endosaturation the zone from 9 to 18 inches is saturated above the densic contact (Bw2 horizon). A seasonal high water table is perched above the densic materials.
- 5. Reaction the pH in the zone from 10 to 18 inches (control section for reaction) is presumed less than 5.0 in 0.01 M CaCl2 (1:2) (see remarks).
- 6. Series control section the zone from 0 to 28 inches.

ADDITIONAL DATA: Reference samples from pedons S00CT013002, S58MA015006, S57MA023004, S77MA005003, S95NH013005, S96NH013002 from Connecticut, Massachusetts, and New Hampshire, samples by NSSL, Lincoln, NE, various years.

# MAP SYMBOL: RksA (Riverhead gravelly sandy loam, 0-3 percent slopes), RksB (Riverhead gravelly sandy loam, 3-8 percent slopes), RksC (Riverhead gravelly sandy loam, 8-15 percent slopes)

SOIL SERIES: Riverhead

CHARACTERISTICS: The Riverhead series consists of very deep, well drained soils formed in glacial outwash deposits derived primarily from granitic materials. They are on outwash plains, valley trains, beaches, and water-sorted moraines. Slope ranges from 0 to 50 percent slopes. Mean annual temperature is 51 degrees F. and mean annual precipitation is 47 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Typic Dystrudepts

TYPICAL PEDON: Riverhead sandy loam, on a 2 percent slope in an area used for recreation. (Colors are for moist broken soil).

Ap-- 0 to 12 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; friable; many fine roots in upper part; moderate to strong platy structure in firm plow pan in lower 4 inches; strongly acid; abrupt smooth boundary. (6 to 13 inches thick.)

Bw-- 12 to 27 inches; strong brown (7.5YR 5/6) sandy loam; very weak medium subangular blocky structure parting to weak fine granular; friable; few fine roots; many fine pores; less than 5 percent gravel; strongly acid; clear wavy boundary. (12 to 24 inches thick.)

BC1-- 27 to 32 inches; yellowish brown (10YR 5/4) loamy sand; very weak fine granular structure; very friable; few fine roots; 10 percent gravel; strongly acid; abrupt smooth boundary. (0 to 10 inches thick.)

2BC2-- 32 to 35 inches; yellowish brown (10YR 5/4) gravelly loamy sand; massive; friable; few fine roots; 30 percent gravel; strongly acid; abrupt smooth boundary. (0 to 10 inches thick.)

2C1-- 35 to 40 inches; brown (7.5YR 4/4) sand; single grain; loose; 10 percent fine gravel; strongly acid; abrupt smooth boundary.

2C2-- 40 to 65 inches; very pale brown (10YR 7/4) coarse and medium sand stratified with

2-inch layers of gravel, 8 to 24 inches apart; single grain; loose; strongly acid.

TYPE LOCATION: Suffolk County, New York; Town of Brookhaven, "Camp Wilderness of Boy Scouts of America", 0.9 mile south of New York Highway 25, 0.3 mile north of junction of County Road 21 with Longwood Road. USGS Bellport, NY topographic quadrangle, Latitude 40 degrees, 52 minutes, 7 seconds N. and Longitude 72 degrees, 56 minutes, 7 seconds W. NAD 1927.

RANGE IN CHARACTERISTICS: Thickness of the solum is from 20 to 40 inches. Depth to bedrock is more than 60 inches. Rock fragments, primarily gravel, range from 0 to 35 percent in the A horizon; 0 to 35 percent in the B horizon; and 5 to 40 percent in the C horizon. Some C horizons, below 40 inches, range from 5 to 60 percent rock fragments.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. Some pedons have a thin A horizon with hue of 10YR, value of 2 through 4, and chroma of 1 or 2. Texture is sandy loam, fine sandy loam, or loam in the fine-earth fraction. Structure is weak or moderate granular and consistence is friable or very friable. Reaction ranges from extremely acid through moderately acid.

The Bw horizon has hue of 7.5YR through 2.5Y, with value of 4 through 6, and chroma of 3 through 6. Texture is sandy loam or fine sandy loam in the fine-earth fraction with more than 50 percent fine sand and coarser. It has weak subangular blocky structure or it is massive. Consistence is friable or very friable. Reaction ranges from extremely acid through moderately acid. Some pedons have a thin AB or BA horizon.

The BC and 2BC horizons have hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 3 through 6. Textures are loamy sand, fine sandy loam, or sandy loam in the fine-earth fraction with coarser texture restricted to the 2BC horizon. They have weak granular or subangular blocky structure or they are massive. Consistence is friable or very friable. Reaction ranges from very strongly acid through moderately acid.

The C or 2C horizon has hue of 7.5YR through 2.5Y, value of 3 through 7, and chroma of 3 through 6. Texture is coarse sand, sand, or loamy sand in the fine-earth fraction or it is stratified sand and gravel. Layers of loamy fine sand are present in some pedons. Some pedons also have a loamy 3C horizon below 40 inches with fine-earth textures of sandy loam or fine sandy loam. Reaction ranges from very strongly acid through neutral. Neutral reactions are restricted to depths greater than 30 inches.

COMPETING SERIES: The Ashe, Brookfield, Buladean, Cardigan, Charlton, Chestnut, Delaware, Dutchess, Edneyville, Flatbush (T), Foresthills (T), Gallimore, Greenbelt (T), Hazel, Lordstown, Newport, Soco, St. Albans, Stecoah, Steinsburg, and Yalesville series are in the same family. Ashe, Cardigan, Hazel, Sharpcrest (T), Soco, Steinsburg, and Yalesville soils are 20 to 40 inches deep to bedrock. Brookfield, Charlton, Dutchess, and St. Albans soils formed in deep glacial till and do not have stratified sand and gravel C horizons. Buladean and Stecoah soils have paralithic contacts at 40 to 60 inches. Chestnut soils have a paralithic contact at 20 to 40 inches. Delaware soils have less than 50 percent fine sand and

coarser in the B horizon. Edneyville soils are underlain by saprolite derived from granite and gneiss and do not have stratified sand and gravel C horizons. Flatbush (T) soils are anthropogenic soils formed in fly ash. Foresthills(T) and Greenbelt(T) soils are anthropogenic soils with surface layers of loamy fill. Gallimore soils are deeper than 50 inches to the bottom of the cambic horizon. Lordstown soils are moderately deep. Newport soils have very dense substrata. Sharpcrest (T) soils do not have an OSD on file to compete.

GEOGRAPHIC SETTING: Riverhead soils are nearly level to steep soils on outwash plains, valley trains, beaches, and water-sorted moraines. Slope ranges from 0 to 50 percent. The soils developed in 20 to 40 inches of water-sorted sandy loam or fine sandy loam relatively low in gravel content over stratified gravel and sand. Mean annual temperature ranges from 48 to 55 degrees F., mean annual precipitation ranges from 38 to 55 inches, and mean annual frost-free days ranges from 135 to 220 days. Elevation ranges from 50 to 1350 feet above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Bridgehampton, Carver, Chenango, Enfield, Haven, Hempstead, Hoosic, Mineola, Montauk, Plymouth, and Sudbury soils. Bridgehampton, Enfield, Haven, and Hempstead soils contain more silt in the layers above the stratified sand and gravel and, in addition, Hempstead soils have thicker dark surface layers. Chenango and Hoosic soils are loamy- skeletal and sandy skeletal, respectively. Mineola soils have thicker dark surfaces and more sand in the subsoil. Montauk soils are closely associated on morainic landforms but have firm till substrata. Plymouth and Carver soils are sandy throughout. Sudbury soils are moderately well drained.

DRAINAGE AND PERMEABILITY: Well drained. The potential for surface runoff is low to medium. Permeability is moderately rapid in the solum and very rapid in the substratum. In pedons that have a loamy substratum, permeability of the substratum below 40 inches is rapid.

USE AND VEGETATION: Most of these soils have been cleared and are used for crops, or are in suburban development. Principal crops are potatoes, cauliflower, cabbage, corn, and hay. Native vegetation is black, white, and red oaks; American beech; and sugar maple.

DISTRIBUTION AND EXTENT: Eastern New York, Long Island and northern New Jersey; possibly southern New England. MLRA 101, 140, 144A, 148, and 149B. The series is of large extent.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Suffolk County, New York, 1970.

REMARKS: The diagnostic horizons and other features recognized in this pedon are:

- 1. Ochric epipedon the zone from 0 to 12 inches (Ap horizon).
- 2. Cambic horizon the zone from 12 to 27 inches (Bw horizon).
- 3. Typic Dystrudepts base saturation (by ammonium acetate) is less than 60 percent in all

subhorizons at depths between 10 and 30 inches.

4. Udic soil moisture regime.

The activity class is estimated.

The concept of discontinuities in an outwash material is a debated concept. Some descriptions in the past have noted several different discontinuities.

# MAP SYMBOL: UR (Urban Land), USRPREB (Urban land-Preakness complex, 0-8 percent slopes), USRHVB (Urban land—Riverhead complex, 3-8 percent slopes), USROC (Urban land-Rockaway complex, 3-15 percent slopes)

SOIL SERIES: None

CHARACTERISTICS: Urban lands are those that have been altered by human activity such as grading or filling to such an extent that the original soil type has been altered. These can also be areas where a large percent of the land surface has been covered by impervious surfaces such as concrete, asphalt, and buildings. Urban lands are generally gently sloping to nearly level. Urban lands are impossible to characterize because of their disturbed nature. They are usually not assigned to a Hydrologic Soil Group although sometimes assigned to Group D. The NRCS does not describe the limitations of these soils.

## MAP SYMBOL: WkkAt (Willette muck, 0-2 percent slopes, frequently flooded) SOIL SERIES: Willette

CHARACTERISTICS: The Willette series consists of very deep, very poorly drained organic soils. They formed in organic material 16 to 51 inches thick overlying clayey deposits in depressions on lake plains, ground moraines and end moraines. Permeability is rapid in the organic layers and slow in the clayey material. Slope ranges from 0 to 2 percent. Mean annual precipitation is about 32 inches and the mean annual temperature is about 49 degrees F.

TAXONOMIC CLASS: Clayey, illitic, euic, mesic Terric Haplosaprists

TYPICAL PEDON: Willette muck - cultivated. (Colors are for moist conditions unless otherwise stated.)

Oap-- 0 to 11 inches; black (5YR 2/1) broken face and rubbed muck (sapric material); about 10 percent fiber, estimated 3 percent rubbed; moderate medium granular structure; very friable; many roots; sodium pyrophosphate black (10YR 2/1); neutral (pH 7.0 in water); abrupt smooth boundary.

Oa2-- 11 to 24 inches; black (10YR 2/1) broken face and rubbed muck (sapric material); about 15 percent fiber, estimated 3 percent rubbed, moderate medium granular structure; very friable; many roots; sodium pyrophosphate dark grayish brown (10YR 4/2); 5 percent coarse woody fragments; neutral (pH 7.0 in water); clear wavy boundary.

Oa3-- 24 to 32 inches; black (10YR 2/1) broken face, very dark brown (10YR 2/2) rubbed muck (sapric material); about 20 percent fiber, estimated 5 percent rubbed, weak medium granular structure; very friable; many roots; sodium pyrophosphate dark grayish brown (10YR 4/2); 8 percent coarse woody fragments; 50 percent mineral; neutral (pH 7.0 in water); abrupt wavy boundary.

2Cg-- 32 to 60 inches; gray (5Y 5/1) silty clay; common fine distinct light olive brown (2.5Y 5/4) mottles; massive; slightly alkaline, strongly effervescent.

TYPE LOCATION: Lenawee County, Michigan about 2 miles south of the village of Macon; 1820 feet west and 325 feet north of the southeast corner, sec. 18., T. 5 S., R. 5 E.

RANGE IN CHARACTERISTICS: The depth to the clayey 2C horizon typically is 20 to 40 inches but ranges from 16 to 51 inches. The fiber is derived from both woody and herbaceous material. Some pedons have layers within the organic portion of the control section that are dominantly woody fiber. The organic material ranges from moderately acid to slightly alkaline (in 0.01M CaCl2). Some subhorizons range to very strongly acid.

The surface tier has hue of 10YR or is neutral, value of 2 and chroma of 0 to 2. In a few pedons the chroma of broken faces differ from rubbed and pressed chroma by one or two units. Fiber volume after rubbing is less than one-sixth of the total volume. It has weak or moderate fine or medium granular structure. Some undisturbed pedons may have a thin layer of hemic material on the surface.

The organic part of the subsurface and bottom tiers have hue of 5YR, 7.5YR, 10YR or is neutral, value of 2 or 3 and chroma of 0 to 3. In a few pedons the chroma of broken faces differ from rubbed and pressed by one or two units. The subsurface and bottom tiers have weak, fine or medium granular, weak thin to thick platy, weak fine to coarse angular or subangular blocky structure. In a few pedons the organic layer above the 2C horizon contains 50 to 60 percent by volume of mineral material. Some pedons have a layer of coprogenous earth as much as 5 inches thick overlying the 2C horizon.

The 2Cg horizon has hue of 2.5Y, 5Y, 10YR, 7.5YR, 5YR, or is neutral, value of 3 to 6 and chroma of 0 to 3. It ranges from silty clay loam to clay and averages more than 35 percent clay. It ranges from strongly acid to moderately alkaline. In most pedons it has slight or strong effervescence.

COMPETING SERIES: There are no other series in the family. Closely related are the Adrian, Allemands, Carlisle, Cathro, Dora, Dorval, Edwards, Houghton, Kingile, Linwood and Palms series. Adrian soils have sandy 2C horizons. Allemands and Kingile soils are thermic. Carlisle and Houghton soils formed in organic deposits more than 51 inches thick. Cathro Dora and Dorval soils are frigid. Edwards soils are underlain by marl at depths less than 51 inches. Linwood and Palms soils contain less clay in their 2C horizons.

GEOGRAPHIC SETTING: Willette soils are on lake plains, ground moraines, or end moraines. They are in former lakes or ponds that range in size from a few acres to several

hundred acres. Slopes are less than 2 percent. The mean annual precipitation ranges from about 25 to 40 inches and the mean annual temperature ranges from 48 to 50 degrees F.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Carlisle, Edwards, Linwood, and Palms soils on similar landscape positions.

DRAINAGE AND PERMEABILITY: Very poorly drained. The depth to the seasonal high water table ranges from 1 foot above the surface to 1 foot below the surface from November to May.Surface runoff is very slow. Permeability is rapid in the organic layers and slow in the clayey material.

USE AND VEGETATION: The greater part of this soil is in natural vegetation of alder, quaking aspen, willow, dogwood,

American elm, white ash, red maple, and a few conifers. A few acres are drained and used for pasture and truck crops.

DISTRIBUTION AND EXTENT: The southern part of the lower peninsula of Michigan, New York, Ohio, Indiana, and Wisconsin.

MLRA OFFICE RESPONSIBLE: Indianapolis, Indiana

SERIES ESTABLISHED: Sanilac County, Michigan, 1955.

REMARKS: Diagnostic horizons and features recognized in this pedon are: organic material from the surface to a depth of 32 inches (Oap, Oa2, and Oa3 horizons); mineral material within a depth of 16 to 51 inches - terric feature.

## **Appendix D:**

Water Quality Report for Pequannock Township, 2008

### PEQUANNOCK TOWNSHIP'S WATER QUALITY REPORT

Some People May be more vulnerable to contaminants in drinking water than is the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline (BOO 426-4791).

Providence of		Maximum	Maximum	Re	sults								
Regulated Contaminants	Units	Contaminant Level Goal (MCLG)	Contaminant Level (MCL)	Newark System	Pequannock System	Source of Contaminant							
Inorganic Conta	minants:												
Antimony	ppb	6	6	222	<3	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.							
Arsenic	ppb	N/A	50	200	<2	Erosion of natural deposits; runoff from orchards and glass and electronic production wastes.							
Barium	ppm	2	2	0.01	0.020	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits.							
Cadmium	ppb	5	5	935	<4	Erosion of natural deposits; corrosion of galvanized pipes; discharge from metal refineries, waste batteries and paints.							
Chromium	ppb	100	100	555	<4	Erosion of natural deposits; discharge from steel and pulp mills.							
Copper	ppm	1.3	AL=1.3	5.55	0.17	Corrosion of household plumbing systems; erosion of natural deposits.							
Cyanide	ppb	200	200	0.066	<2	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.							
Fluoride	ppm	4	4	0.081	0.12	Erosion of natural deposits; water additive promoting strong teeth; discharge from fertilizer and aluminum factories.							
_ead	ppb	0	AL=15	0-10.2	7	Corrosion of household plumbing systems; erosion of natural deposits.							
Mercury	ppb	2	2	< 0.02	<0.2	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland							
Nitrate (ppm as nitrogen)	ppm	10	10	0.05	1.16-5.23 Highest level = 5.23	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.							
Dedicted of the	LONGO CONT.												
Radiological Su		0	46		0.7	Facility of a New House St.							
Gross Alpha	pCi/I	0	15	B	2.7	Erosion of natural deposits.							
Radium	pCi/l	0	5			Erosion of natural deposits.							
Total Coliforms, Bacteria	Number of positive sample	0	One Positive Sample per month	0	2	Naturally present in the environment.							
Turbidity:													
Turbidity	ntu	N/A	0.3-1 NTU	0.03-0.39	222	Soil runoff.							
Turbidity	ntu	IND	0.0 1 1010	0.00 0.00		Soil fulloit.							
Volatile Organic	Chemical	e•											
TTHMs Total	ppb	N/A	80	44-58 average = 50	0.05-55.8 average = 24.5	By-product of drinking water disinfection.							
Halo Acetic Acids	ppb	N/A	60	33-52 average = 44	1.20-21.5 average = 13.1	By-product of drinking water disinfection.							
1, 1, 1- Trichloroethane			30	N.D.	2.2								
HIGHIOTOERIANE						Discharge from metal degreasing sites and other factories.							
			Secondary	Re	sults								
Secondary Contaminants	Units		Standard (Recommended Upper Limit)	Newark System	Pequannock System	Source of Contaminant							
Numinum	ppm		0.2	0.046	<0.1	By-product of water treatment using aluminum salts;							
Chloride	ppm		250	26.6	135	Erosion of natural deposits.							
Chlorine Residual	ppm		4	0.864	0.02-0.89	Chlorine remaining in treated water and available to destroy disease causing organisms.							
Color	CU		10	4	<5	Presence of manganese and iron, plankton, humus, peat and weeds.							
Hardness	ppm		50-250	42.2	350	A characteristic of water caused primarily by salts of calcium and magnesium.							
ron	ppm		0.3		<0.15	Erosion of natural deposits.							
Vlanganese	ppm		0.05	3.6	0.005	Erosion of natural deposits.							
Odor (TON)	TON		3	1	0.003	Algae and plant matter.							
odor (1014)	units		6.5-6.8	7.34	7.53-7.84	Presence of carbonates, bicarbonates, and carbon dioxide.							
Sodium	ppm		50	13.7	89.4	Runoff from road salt and from some water softening processes.							
Sulfate	ppm		250	14.0	38	Drainage of mining wastes, erosion of natural deposits.							
Zinc	ppm		5	14.0	0.318	Erosion of natural deposits.							
THE STATE OF THE S	bkin		500	115	464	Erosion of natural deposits.							

#### SAFE DRINKING WATER ACT (SDWA)

Amendmentetothe Safe Drinking Water Act in 1996 require that utilities issue an armusal "Consumer Confidence Report" to its ourtomers. This report details where our water comes from, what it contains, and the risks our water testing and treatment are designed to prevent. The Township of Pequannod: a committed to providing you with the salest and most reliable water supply. Informed consumers are our best allies in maintaining safe ditriking water.

We are proud to report that the water provided by Pequatrood: Township meets or exceeds Federal primary

water standards

Water Source: The Jequinnock Township Water Utility is supplied by three ground water wells located in the morthern portion of the Township in the vicinity of West Darkway and the Boulevard Depths of the wells rarge from 1 St to 196 feet.

Subsurface ground formations that produce ground water which the wells draw from an known as aquifer. Water in aquifers once mainly from min and grow which passes through the ground and becomes part of the ground water. The aquifer which the Township wells draw from is known as the Buried Valley Aquifer. The characterist is of this aquifer is a thick layer of unconsolidated sediments which includes course sand, grave land fine too ib which were deposted at the end of the last ice age.

In addition to the three Township wells, Pequamodic water system has two interconnections with the City of Newark water system. Newark's water owner has two interconnections with the City of Newark water system. Newark's water comes from a surface source from the Pequamodic Water Shedwhich is applied by five reservoirs; Charlottechurg, Echo Like, Canistear, Clinton and Calc Ridge. The purpose of these interconnections is to supplement the Township's supply of water during high demand periods and for emergency supply. These interconnections exist along the aqueduct which crosses the Township and the connections are located at Hopper Avenue and Jefferson Street. During 2007, the approximate volume of water delicated from the Newark system represents 21.94% of the annual volume of water distributed by the Township. tributed by the Township.

The Township also has interconnections and provides water for distribution to the Boroush of Lincoln Park and Riverdale.

The New Je sey Department of Environmental Protection (NJDEP) has completed and inseed the Source Water Assessment Report and Summary for this public water system, which is available at www.statentusAteplasspi or by contacting the NJDEP, Bureau of Safe Drinking Water at (609) 292-5590. The contracting the system water water as a contracting on our source water agreement performed on our three well sources determined the following:

Pequatrook Township Water Department is a public community water system consisting of 3 well(s), 0 wells under the influence of surface water, 0 surface water intake(s), 0 purchased ground water source(s), and 1 purchased surface water source(a)

This system's source water comes from the following aquifer(s) and/ or surface laying bare latesty (aldasidge 3) (e) ybod ratew

This system purchases water from the following system(s) (if applicable); NEWARK WATER DEBARTMENT.

#### SUSCEPTIBILITY RATINGS FOR THE PEQUANNOCK TOWNSHIP WATER DEPART-MENT SOURCES

The table on top of page 4 illustrates the succept billity ratings for the seven contain hant categories (and adon) for each source in the system. The table provides the number of well-and trakes that rated high (H), medium (M), or low (L) for each contain hant category. For suscept billity of punchased water, refer to the specific water. eyetem's source water assessment report

The seven contaminant categories are defined on page 4. DED considered all surface water highly succeptible to pathogene, therefore all intakes race bed a high rating for the pathogen, category. For the purpose of Source Water Assessment Program, indicrutalishes more of a contemitor ground water than surface water As a result, surface water intakes succept billity to adiorucilides was not determined and they all received a low rating.

It a system is sated highly susceptible for a containment category, it does not mean a customer is or will be consuming contaminated drinking water. The tating reflects the <u>potential</u> for contamination of source water, not the existence of contamination. Public water systems are required to monitor for regulated contaminants and to install treatment if any contaminants are detected at frequencies and concentra-tions above allowable levels. As a result of the assessments, DEP may outomize egritar y filidit quoese ed taro besed esluberbe graro farom (grateixe egrado)

Sources	Pathogens			Nuusems			Pegricides			Volumble Onganie Compounds			Inorganies			Radio- Nuclides			Radon			Distriction Bygooducts Precursors		
	н	M	L	н	M	L	н	M	I	н	M	L	н	М	I	н	М	L	н	М	L	н	M	L
Well-3	8		3	3	19		8	1	2	2		1	0	3	5	3		33	2	1		8	3	30
GUDI-0	3			30	12			3				100		2	5			98						
Surface Water Intakes-0																								

- Bathogens: Disease-causing organisms such as bacteria and vinees Common sources are an imal and human fecal wastes
- Nutrien 8: Compounds, minerals and elements that aid growth, that are both rally occurring and man-made. Examples include rutrogen and phosphorus,
- Volatile Organic Compounds: Man-made chemicals used as solvents, degreesers and greatine components. Examples include between, methyl tetrany busyk ether (MTRE), and vary i chloride.
- Pesticides: Maremade chemicals used to control pests, weeds and fungus. Common sources include land application, and manufacturing centers of perticides: Examples include herbicides such as streetie, and treed icides such as chloribine.
- Inorganics: Miteral-based compounds that are both naturally occurring and man-made. Examples include areanic, asbestos, copper, lead and mitrate
- Padion utilities: Radioactive substances that are both naturally occurring and man-made. Examples include radium and uranium.
- Padon: Colodess, odorkes, cancer causing gas that occurs raturally in the ero's priment. For more information go to http://www.nj.gov/dep/pp/sadon/index.htm.or
- Distribution Byproduct Precursors: A common source is returnly occurring matter in surface water Disinfection byproducts are formed when the disinfector (usually dislottine) used to kill pathogene react with dissolved organic material (for example leaves) present in surface water

I asystem is rated highly susceptible for a contamination category, it does not mean a customer is or will be consuming contaminated drinking water. The rating reflects the potential for contamination of source water, not the existence of contamination. Rublic water sectems are detected at the quencies and concentrations above allowable

### TREATMENT OF WATER

The Township treats to water with sodium hypochionite (dh.lonine) at all those wells. The purpose of this treatment is to district the water to kill in icoorganisms which can cause diseases such as typhoid fever and cholera.

In addition, Well #3 water passes through an air stripper to reduce the level of

#### TESTING OF WATER

To ensure the safety of our water, the Township of Pequarmods. monitors the quality of water at the wells and within the distribution, system. More than 100 compounds are evaluated at NIDEP and EPA. cet fied laboratories. This report is based upon tests conducted in 2006 and 2007 by the Pequamock Township Health Department. Terms used in the Water Quality Table on pages 1 & 2 and in other parts of this mport are defined here



Maximum Contaminant Level (MCL) . The highest level of a contaminant that is allowed in dunking water McLo are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Laval Goal (MCLG) - The level of a contaminant in dunking water below which there is no known or expected talk to health. MCLGs allow for a margin of safety.

Maximum Residual Disinfectant Level (MRDL) - The highest level of disinfectant allowed in dataking water There is convincing evidence that addition of a dis-infectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Goal (MRDLG) - The level of a dunking wat district and below which there is no known or expected task to health MRILCs do not reflect the benefits of the use of district and to control microbial contamination.

Primary Standards - Federal drinking water regulations that are health to lated Secondary Standard - Federal drinking water measurements for substances that are not health related. These are recommended levels and reflect aesthetic qualities of

in t Tach nique: A required process intended to reduce the level of a contamtrant in drinking water

Action Level: The concentration of a contaminant which, if exceeded, triggers a treatment or other requirement which a water system must follow.

Variance and Examption: Both of these terms are defined as State or EPA permission not to meet an MCL or a treatment technique undercestain conditions

Key to Table: Ma Action Level Maximum Contaminant Level MCLG Maximum Contaminant Level Goal MR Million Fibers per Liter Maximum Residual Dissofectant Level Maximum Residual Dissofectant Goa I MRTS MRDLG millionoper year (a measure of radiation absorbed by the body) Nephelometric Turbid by Unite moem/year UTK pcill

picoruries per liter (a messure of radioact bity) part aper million, or milligramaper liter (mg/l) ppm 66 85 85T partoper billion, or microgramoper liter (ug/l) partoper trillion, or manogramo per liter partoper quadrillion, or picogramoper liter Treatment Technique

#### WHAT DO THE #S MEAN?

In this new letter, we have deal extensively with standards in determining tederal and state safe distribute water requirements. A standard is a rule, a principle or a measurement established by governmental authority. These regulations protect the

Life is dependent upon water. Water exists in mature in many forms... in clouds, rain, snow, ice and fog. Even while falling so tain, waterpide-up small amount of guess, ions, dust, and past is label enables from the atmosphere.

Then, as a flow over or through the surface layer, a dis-solves and carries with a some of a most everything that 2 touches including that which is discarded by man.



To ensure that top water is safe to drink, EBA pre-scribes limite on the amount of certain contaminants in water provided by public water systems. FDA regula-tions establish limits for contaminants in bott led water.

Durking water, including bottled water, may reasonably be expected to contain. at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contamirante and potential health effects can be obtained by calling the Environmental Protection Agency Safe Drinking Water Hotline (800 426-4791).

The source of drinking water (both top water and bottled water) include cases, likes, streams ponds, reservoirs, springs and we list the water travelscore the surface of the land or through the ground, it dissolves naturally-counting mixerals and radioactive material, and campick-up-substances-resulting from the presence of animals bot from human.

Contaminant ethat may be present in source water include:

(A) Microbia Loontain inents which may come from awage treatment plants, sept is systems, spricultura Librestock operations and wild life.

(B) inorganic contaminants, such as salt and metals, which can be naturally conutring or result from urban storm numbf, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

(C) Peticides and herbicides, which may come from a variety of sources outh as agriculture, stormwater runoff and residentia luse

(D) Organic chemical contaminants, including synthetic and volatile organics, which are hyproducts of industrial processes and petroleum production, and can also come from gas stations, urban stomwater runoff and sept ic systems

(E) Red joint are contaminante, which can be naturally occurring or be the result of oil and gas production and mining activities

(F) Radon - Pequannock's water does contain radon, however, the amount of radon detected complies with State and Federal regulations. Radon is a radioactive gas that you can't see, taste or small. Found throughout the U.S. radon can move up through the can't see, case or small fourth troughout the U.S. Fastor can move up through the ground and into a home through cracks and holes in the foundation. Radion can build up to high levels in all hypes of homes. Radion can also get into indoor a it when he leved from the water from showning, weshing dishes and other household activities. Compared to radion enter ingothe home through soil, radion entering the home through top water will in most cases be a small source of radion in indoor a it Radion is almown human carcinogen. Describing a containing radion can lead to lung cancer. It inking water containing radion. may also cause increased risk of stomath cancer. If you are concerned about radion in your home, test the air in your home. Testing is incorporable and easy. Where the level of adont is 4 piccouries per liter of air (pC/VL) or higher, home repairs should be made which can correct this problem. There are simple ways to fix a radion problem that secrit too cost by. For aid triumal information, call your state radion program or call ERA's Radion Hot line (and only in ATMA). (800-SOS-RATION).

(C) Copt opositism - The City of Newsk teste is finished water supply for cryp-topositism on a monthly basic. It has never been detected in a viable state in it's treated water supply. Cryptospa if it is a microbia Lpathogen found in surface water throughout the U.S. Although filtest ion temores aryptospor if it is, the most commandy used filtest ion methods cannot granantee 100 percent removal. Ingest ion of cryptosporid it in may cause cryptosporidiose, an abdominal infection. Symptoms of infection include nauses, discribes and abdominal comps. Most healthy individuals can orescome the disease within a few weeks However, immuno-compromised people are at greater risk of developing lifethreatening illness. We encourage immuno-compromised and avaluate to core ut their doc-tor regarding appropriate presastions to take to avoid infection. Copprospor aliam must be ingested to cause disease, and it may be spread through means other than drinking water.

(H) Chlorine - A century ago, acute disease such as typhoid fever and cholers were a sery resulthness to our health because the microorganisms that caused these diseases were found in public drinking water. However, for a hoot 100 years, water sup-

plies in America and other countries have used chilorine to treat or disinfect draining water. According to the U.S. Environmental Protect ion Agency and other has this gen-cies, dularine is currently one of the most effective distrifectants to kill harmful microorganisms. Disinfection of all public water supplies is required by State and Federal laws and regulations, including the Safe Drinking Water Act and the Surface Water Treatment Rule.

(1) Total Tribalmethanes (TTHMS) - Unitrested

water contributions that may cause illness. Chilorine is used as a primary disinfectant and series to maintain, a level of disinfection, in the pipes that transport water to home and businesses. When organic compounds in unitested water teach with chlorine, they produce hypoduce-known as it halamethanes (three). Some people who dishk water containing it halamethanes in excess of the MCL over many resmay experience problems with the liver, kidneys, or centra liner roussystem, and may pane our purchased tipy of Septials course.

(j) Turbidity - Turbidity is a measure of the cloud iness of the water. We monitor it because it is a good and instor of water quality. High turbidity can hander the effectiveness. of district acts

In order to ensure that top water is safe to drink, EDA press the requisitions which, limit the amount of certain contaminants in water provided by public water systems FDA regulations establish, limits for contaminants in bottled water which must growide the same protect ion for public has lift.

#### WATER HARDNESS

Hadness is the level of dissolved natural minerals (calcium and magnesium) found naturally in water. These minera base are important part of a healthy diet. Hasd water containemore mineral nutrients and less sodium. A gradual build-up of calcium and magnesium may form a harmless, filmy white deposit on faucets, and inteakettles. Hard water also requires more soap to lather fully.



CONCERNING NITRATES IN OUR WATER
Nitrate in dishking water at lave babove 10 ppm is a health cisk for infants of less
than air months of age. High nations levels in dishking water can cause "Blue Baby" age: drome and shortness of boosth. Natiste levels may rise quickly for short periods of time because of minfall or spricultural activity. If you are caring for an infant, you should ask advice from your health care provides.

#### CONCERNING SODIUM IN OUR WATER

Tequanance: Township Water System exceeded the Secondary Recommended Upper Limiz (ROLL), for Sodium during the period October 1, 2006 through September 30, 2006. The ROLL for Sodium is 90 parts per million (ppm) and our water system detected sodium at 75.35 ppm.

This is not an emergency, but as our customers, you have the right to know what happened and what is being done to correct the situation. For healthy individuals, the sodium intake from water innot important, because a much greater intake of sodium intake from water innot important, because a much greater intake of sodium takes place from salt in the diet. However, sodium levels above the KULL might be of concern to individuals on sodium restricted dieta.

What Should I Do? There is nothing you need to do at this time. What Happened? What is being done? Sodium is desired geologically from the leaching of surface and underground deposits of as it (example Sodium Chloride), and from the decomposition of sodium silicate and similar minerals. The sodium ion is a major constituent of retural. waters. Human act bytes also contribute sod aim to water applies, primarily through the use of sodium childred as a defining spent and the use of weshing products. Requarized. Township has not identified the origin of sodium in the water at this time. Requarized. Township his not slentified the origin of sodium in the water at this time. Requarized. pliance with State and Ridea Llaws, and is investigating what corrective action may be taken to improve this condition with guidance from the New Jessey Department of Environmental Protection (MIDEP).

Please there this information with a little other people who drink this water, espe-cially those who may not have received this not ice directly (for example, people in sport-ments, nursing homes, schools, and businesses). You can do this by posting this not ice in a public place or distributing copies by hand or mail.

#### QUESTIONS ABOUT WATER TESTING AND THE PEQUANNOCK TOWNSHIP WATER SYSTEM

If you have any questions about this Water Quality Report or the water testing performed by the Township, please contact the Health Department at (973) 835-5700 Erit 127 between the house of 830 am and 4:30 pm.

To learn more about the water system, 25 operation and supply, please contact the Department of Dublic Workship (973) 835-9001.

The Township Council meets on the second and fourth Tuesdays of each month. There is a public discussion period at each meeting where questions and concerns are addressed. These meetings are open to the public and you are always welcome and invited to attend.

## **Appendix E:**

### Wildlife of Pequannock Township

# Birds Sighted in Pequannock Township 1979-1989 by the NJ Audubon Society (continued) with supplement by Ross Kushner, 2008—supplements denoted with \*

Туре	Common Name			
Loons and Grebes	Common Loon			
	Pied-Billed Grebe			
	Horned Grebe			
Swans and Geese	Mute Swan			
	Snow Goose			
	Brant			
	Canada Goose			
Marsh Ducks	Gadwall			
	Mallard			
	Pintail			
	American Widgeon			
	Wood Duck			
	Northern Shoveler			
	Blue Winged Teal			
	Green Winged Teal			
	Black Duck*			
Diving Ducks	Black Scoter			
	Old Squaw			
	Ring-Necked Duck			
	Lesser Scaup			
	Common Goldeneye			
	Bufflehead			
	Ruddy Duck			
Mergansers	Common Merganser			
	Red-Breasted Merganser			
	Hooded Merganser			
Duck-like Swimmers	American Coot			
	Common Gallinule			
	Sora Rail			
	Yellow Rail			

Туре	Common Name			
Herons and Storks	Great Blue Heron			
	Louisiana Heron			
	Black Crowned Night Heron			
	Yellow Crowned Night Heron*			
	Little Blue Heron			
	Great Egret			
	Snowy Egret			
	American Bittern			
Plovers	Semipalmated Plover			
	Red-bellied Plover			
	Black-bellied plover			
Sandpipers	American Woodcock			
	Common Snipe			
	Long-billed Dowitcher			
	Short-billed Dowitcher			
	Willet			
	Greater Yellowlegs			
	Lesser Yellowlegs			
	Wilson's Pharalope			
	Solitary Sandpiper			
	Sanderling			
	Pectoral Sandpiper			
	Upland Sandpiper			
	Ruff			
	Stilt Sandpiper			
	Dunlin			
	Spotted Sandpiper			
	Least Sandpiper			

# Birds Sighted in Pequannock Township 1979-1989 by the NJ Audubon Society (continued) with supplement by Ross Kushner, 2008—supplements denoted with \*

Туре	Common Name
Sandpipers (continued)	Semipalmated Sandpiper
	Western Sandpiper
	Bairds Sandpiper
	White-rumped Sandpiper
Hawks, Eagles, Accipters	Sharp-shinned Hawk
	Coopers Hawk
	Red-Shouldered Hawk
	Red-tailed Hawk*
	Rough-legged Hawk
	Broad-Winged Hawk
	Bald Eagle
	Osprey
	Turkey Vulture
	Black Vulture
	Peregrine Falcon
Owls	Common Screech Owl
	Short-Eared Owl
	Long-Eared Owl
	Great Horned Owl
	Snowy Owl
Gulls and Allies	Iceland Gull
	Forsters Tern
	Herring Gull
Land Birds	Black-Billed Cuckoo
	Common Nighthawk
	Belted Kingfisher
	Ruby-Throated Hummingbird
	Pileated Woodpecker
	Red-Headed Woodpecker

Туре	Common Name
Land Birds (continued)	Yellow-Shafted Flicker
	Red-Shafted Flicker
	Red-Bellied Woodpecker
	Yellow-Bellied Sapsucker
	Downy Woodpecker
	Hairy Woodpecker
	Eastern Kingbird
	Eastern Wood Peewee
	Willow Flycatcher
	Olive-sided Flycatcher
	Yellow-Bellied Flycatcher
	Phoebe
	Water Pipit
	Purple Martin
	Barn Swallow
	Cliff Swallow
	Bank Swallow
	American Crow
	Blue Jay
	White-Breasted Nuthatch
	Black-Capped Chickadee
	Tufted Titmouse
	Red-Breasted Nuthatch
	Brown Creeper
	Marsh Wren
	Winter Wren
	Carolina Wren
	Short-Billed Marsh Wren
	Ruby-Crowned Kinglet
	Golden-Crowned Kinglet

# Birds Sighted in Pequannock Township 1979-1989 by the NJ Audubon Society (continued) with supplement by Ross Kushner, 2008—supplements denoted with \*

Туре	Common Name
Land Birds (continued)	Blue-Grey Gnatcatcher
	Brown Thrasher
	Northern Mockingbird
	Catbird
	Eastern Bluebird
	American Robin
	Wood Thrush
	Grey-Cheeked Thrush
	Cedar Waxwing
	Warbling Vireo
	Solitary Vireo
	Philadelphia Vireo
	Prothontory Warbler
	Yellow Warbler
	Black & White Warbler
	Yellow-Rumped Warbler
	Bay-Breasted Warbler
	Black-Throated Green Warbler
	Blackpoll Warbler
	Connecticut Warbler
	Hooded Warbler
	Wilson's Warbler
	Palm Warbler
	Orange-Crowned Warbler
	Cape May Warbler
	Blue Winged Warbler
	Tennessee Warbler
	Nashville Warbler
	Green Warbler

Туре	Common Name				
Land Birds (continued)	Blackburnian Warbler				
	Canada Warbler				
	Pine Warbler				
	Yellow-Breasted Chat				
	Louisiana Waterthrush				
	Red-Winged Blackbird				
	Brown-Headed Cowbird				
	Common Grackle				
	Rusty Blackbird				
	Bob-o-link				
	Starling				
	Orchard Oriole				
	Northern Oriole				
	Scarlet Tanager				
	House Sparrow				
	Dickcissel				
	Snow Bunting				
	Lapland Longspur				
	Northern Junco				
	Cardinal				
	Common Redpoll				
	Purple Finch				
	House Finch				
	Evening Grosbeak				
	Blue Grosbeak				
	Rose-Breasted Grosbeak				
	Black-Headed Grosbeak				
	Indigo Bunting				
	American Gold Finch				

# Birds Sighted in Pequannock Township 1979-1989 by the NJ Audubon Society (continued)

with supplement by Ross Kushner, 2008—supplements denoted with \*

Туре	Common Name
Land Birds (continued)	Rufous-Sided Towhee
	Pine Siskin
	Song Sparrow
	White-Throated Sparrow
	Vesper Sparrow
	Lark Sparrow
	American Tree Sparrow
	Lincoln Sparrow
	Grasshopper Sparrow
	White-Crowned Sparrow
	Savannah Sparrow
	Henslow's Sparrow
	Sharp-Tailed Sparrow
	Clay-Colored Sparrow
	Fox Sparrow
	Seaside Sparrow
	Chipping Sparrow

**List of Mammals for Pequannock Township**Habitat preferences are listed as W-woodland; O-open country (meadows, fields); Rriparian habitat (streams, lakes, wetlands). State threatened and endangered species are also indicated (\* - endangered, \*\*- threatened).

Common name	Latin name	Habitat Preference	
Black Bear	Ursa americanus	W	
Beaver	Castor canadensis	R	
Bobcat**	Felix rufus	W	
Cottontail Rabbit	Sylvilagus floridanus	W/O	
Coyote	Canis latrans	W/O	
Eastern Chipmunk	Tamias striatus	W	
Eastern Mole	Scalopus aquaticus	W/O	
Gray Fox	Urocyom cinereoargenteus	W/O	
Grey Squirrel	Sciurus carolinensus	W	
Indiana Bat	Myotis sodalist	W	
Little Brown Bat	Myotis lucifugus	W/O/R	
Long Tailed Weasel	Mustela frenata	W/O	
Masked Shrew	Sorex cinereus	W/O	
Meadow Vole	Microtus pennsylvanicus	0	
Mink	Mustela vison	R	
Muskrat	Ondatra zibethicus	R	
Opossum	Didelphus marsupalis	W/O	
Raccoon	Procyon lotor	W/O/R	
Red Fox	Vulpes fulva	W/O	
Red Squirrel	Tamiasciurus hudsonicus	W	
River Otter	Lutra canadensis	R	

#### **List of Mammals for Pequannock Township (continued)**

Habitat preferences are listed as W-woodland; O-open country (meadows, fields); R-riparian habitat (streams, lakes, wetlands). State threatened and endangered species are also indicated (\* - endangered, \*\*- threatened).

Common name	Latin name	Habitat Preference	
Striped Skunk	Mephitus mephitus	W/O	
Southern Red-backed Vole	Cletbrionomys gapperi	0	
Southern Bog Lemming	Synaptomys cooperi	0	
Southern Flying Squirrel	Glaucomys volans	W	
White-footed Mouse	Peromyscus leucopus	W/O	
White-tailed Deer	Odocoileus virginianus	W/O	
Woodchuck	Marmota monax	0	

# List of Reptiles and Amphibians for Pequannock Township State threatened and endangered species are indicated (\* - endangered, \*\*- threatened).

Common name	Latin name
American toad	Bufo americanus
Black rat snake	Elaphe o. obsoleta
Bull frog	Rana catesbeiana
Common snapping turtle	Chelydra s. serpentina
Cricket frog	Acris crepitans
Eastern box turtle	Terrapene c. carolina
Eastern garter snake	Thamnophis s. sirtolis
Eastern painted turtle	Chrysemys p. picta
Eastern red-spotted newt	Notophthalmus viridescens
Five-lined skink	Eumeces fasciatus
Gray tree frog	Hyla versicolor
Green frog	Rana clamitans
Marbled salamander	Ambystoma opacum
Northern black racer	Coluber c. constrictor
Northern red salamander	Pseudotriton r. ruber
Northern water snake	Natrix s. sipedo
Pickerel frog	Rana palustris
Spotted turtle	Clemmys guttata
Timber rattlesnake*	Crotalus h. horridus
Wood frog	Rana sylvatica
Wood turtle**	Clemmys insculptata

## List of Fish for Pequannock Township

Common name	Latin name
Bass, largemouth	Micropterus salmoides
Bass, smallmouth	Micropterus dolomieui
Bluegill sunfish	Lepomis macrochirus
Blacknose dace	Rhinichthys atratulus
Brown bullhead	Ictalurus nebulosus
Carp	Cyprinus carpio
Chain Pickerel	Esox niger
Common shiner	Notropis cornutus
Creek chub	Semotilus atromaculatus
Fallfish	Semotilus corporalis
Northern Pike	Esox lucius
Pumpkinseed sunfish	Lepomis gibbosus
Tessellated darter	Etheostoma olmstedi
White sucker	Catostomus commersoni
Yellow perch	Perca flavescens

## **Appendix F:**

Rare Plant Species and Ecological Communities Presently Recorded in the NJ Natural Heritage Database For Morris County

#### EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

#### **FEDERAL STATUS CODES**

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 61, No. 40; F.R. 50 CFR Part 17). Federal Status codes reported for species follow the most recent listing.

- LE Taxa formally listed as endangered.
- LT Taxa formally listed as threatened.
- **PE** Taxa already proposed to be formally listed as endangered.
- PT Taxa already proposed to be formally listed as threatened.
- C Taxa for which the Service currently has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.
- **S/A** Similarity of appearance species.

#### STATE STATUS CODES

Two animal lists provide state status codes after the Endangered and Nongame Species Conservation Act of 1973 (NSSA 23:2A–13 et. seq.): the list of endangered species (N.J.A.C. 7:25–4.13) and the list defining status of indigenous, nongame wildlife species of New Jersey (N.J.A.C. 7:25–4.17(a)). The status of animal species is determined by the Nongame and Endangered Species Program (ENSP). The state status codes and definitions provided reflect the most recent lists that were revised in the New Jersey Register, Monday, June 3, 1991.

- D Declining species—a species which has exhibited a continued decline in population numbers over the years.
- E Endangered species—an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors—a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.
- **EX** Extirpated species –a species that formerly occurred in New Jersey, but is not now known to exist within the state.
- I Introduced species a species not native to New Jersey that could not have established itself here without the assistance of man.
- INC Increasing species—a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long term period.
- T Threatened species a species that may become endangered if conditions surrounding the species begin to or continue to deteriorate.
- P Peripheral species—a species whose occurrence in New Jersey is at the extreme edge of its present natural range.
- \$ Stable species-a species whose population is not undergoing any long-term increase/decrease within its natural cycle.
- U Undetermined species-a species about which there is not enough information available to determine the status.

Status for animals separated by a slash(/) indicate a duel status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

SC Special Concern – applies to animal species that warrant special attention because of some evidence of decline, inherent vulnerability to environmental deterioration, or habitat modification that would result in their becoming a Threatened species. This category would also be applied to species that meet the foregoing criteria and for which there is little understanding of their current population status in the state.

Plant taxa listed as endangered are from New Jersey's official Endangered Plant Species List N.J.S.A. 131B-15.151 et seq.

E Native New Jersey plant species whose survival in the State or nation is in jeopardy.

#### REGIONAL STATUS CODES FOR PLANTS AND ECOLOGICAL COMMUNITIES

- LP Indicates taxa listed by the Pinelands Commission as endangered or threatened within their legal jurisdiction. Not all species currently tracked by the Pinelands Commission are tracked by the Natural Heritage Program. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan.
- HL Indicates taxa or ecological communities protected by the Highlands Water Protection and Planning Act within the jurisdiction of the Highlands Preservation Area.

#### **EXPLANATION OF GLOBAL AND STATE ELEMENT RANKS**

The Nature Conservancy developed a ranking system for use in identifying elements (rare species and ecological communities) of natural diversity most endangered with extinction. Each element is ranked according to its global, national, and state (or subnational in other countries) rarity. These ranks are used to prioritize conservation work so that the most endangered elements receive attention first. Definitions for element ranks are after The Nature Conservancy (1982: Chapter 4, 4.1–1 through 4.4.1.3–3).

#### GLOBAL ELEMENT RANKS

- Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.
- Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.
- Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout it's range; with the number of occurrences in the range of 21 to 100.
- G4 Apparently secure globally; although it may be quite rare in parts of its range, especially at the periphery.
- G5 Demonstrably secure globally; although it may be quite rare in parts of its range, especially at the periphery.
- **GH** Of historical occurrence throughout its range i.e., formerly part of the established biota, with the expectation that it may be rediscovered.
- **GU** Possibly in peril range-wide but status uncertain; more information needed.
- GX Believed to be extinct throughout range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered.
- **G?** Species has not yet been ranked.
- **GNR** Species has not yet been ranked.

#### STATE ELEMENT RANKS

- Critically imperiled in New Jersey because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.
- S2 Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.
- Rare in state with 21 to 100 occurrences (plant species and ecological communities in this category have only 21 to 50 occurrences).

  Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.
- **S4** Apparently secure in state, with many occurrences.
- S5 Demonstrably secure in state and essentially ineradicable under present conditions.
- Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include European strays or western birds on the East Coast and vice-versa.
- SE Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).
- Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work.
- **SP** Element has potential to occur in New Jersey, but no occurrences have been reported.
- SR Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.
- **SRF** Elements erroneously reported from New Jersey, but this error persists in the literature.
- SU Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.
- Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.
- SXC Elements presumed extirpated from New Jersey, but native populations collected from the wild exist in cultivation.

Not of practical conservation concern in New Jersey, because there are no definable occurrences, although the taxon is native and appears regularly in the state. An SZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped and protected. In other words, the migrant regularly passes through the state, but enduring, mappable element occurrences cannot be defined.

Typically, the SZ rank applies to a non-breeding population (N) in the state – for example, birds on migration. An SZ rank may in a few instances also apply to a breeding population (B), for example certain lepidoptera which regularly die out every year with no significant return migration.

Although the SZ rank typically applies to migrants, it should not be used indiscriminately. Just because a species is on migration does not mean it receives an SZ rank. SZ will only apply when the migrants occur in an irregular, transitory and dispersed manner.

- **B** Refers to the breeding population of the element in the state.
- **N** Refers to the non-breeding population of the element in the state.
- T Element ranks containing a "T" indicate that the infraspecific taxon is being ranked differently than the full species. For example *Stachys* palustris var. homotricha is ranked "G5T? SH" meaning the full species is globally secure but the global rarity of the var. homotricha has not been determined; in New Jersey the variety is ranked historic.
- **Q** Elements containing a "Q" in the global portion of its rank indicates that the taxon is of questionable, or uncertain taxonomical standing, e.g., some authors regard it as a full species, while others treat it at the subspecific level.
- .1 Elements documented from a single location.

Note: To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2?). A range is indicated by combining two ranks (e.g., G1G2, S1S3).

#### **IDENTIFICATION CODES**

These codes refer to whether the identification of the species or community has been checked by a reliable individual and is indicative of significant habitat.

These codes are not included on all Natural Heritage Reports.

Y Identification has been verified and is indicative of significant habitat.

**BLANK** Identification has not been verified but there is no reason to believe it is not indicative of significant habitat.

Either it has not been determined if the record is indicative of significant habitat or the identification of the species or community may be confusing or disputed.

Revised November 2008

#### Rare Plant Species and Ecological Communities Presently Recorded in the NJ Natural Heritage Database

	Scientific Name	Common Name	Federal Status	State Status	Regional Status	G Rank	S Rank
County:	Morris						
	Internatl. Vegetation Classification						
	Picea mariana / (Vaccinium corymbosum, Gaylussacia baccata) / Sphagnum sp. Woodland	Black Spruce Woodland Bog			HL	G3G5	S1
	Tsuga canadensis - Betula alleghaniensis / Ilex verticillata / Sphagnum spp. Forest	Hemlock - Hardwood Swamp			HL	G5	S2
	<b>Terrestrial Community - Other Classification</b>						
	Black spruce swamp	Black Spruce Swamp				G4	S1
	Vascular Plant						
	Adlumia fungosa	Climbing Fumitory			HL	G4	S2
	Agastache nepetoides	Yellow Giant-hyssop			HL	G5	S2
	Alopecurus aequalis var. aequalis	Short-awn Meadow-foxtail			HL	G5TNR	S2
	Andromeda glaucophylla	Bog Rosemary		E	LP, HL	G5T5	S1
	Angelica venenosa	Hairy Angelica			HL	G5	S1
	Aristolochia serpentaria	Virginia Snakeroot			HL	G4	S3
	Asclepias variegata	White Milkweed			HL	G5	S2
	Asclepias verticillata	Whorled Milkweed			HL	G5	S2
	Asplenium bradleyi	Bradley's Spleenwort		E	LP, HL	G4	S1
	Asplenium montanum	Mountain Spleenwort			HL	G5	S2
	Aster radula	Low Rough Aster		E	LP, HL	G5	S1
	Botrychium multifidum	Leathery Grape Fern		E	LP, HL	G5	S1
	Botrychium oneidense	Blunt-lobe Grape Fern			HL	G4Q	S2
	Calystegia spithamaea	Erect Bindweed		E	LP, HL	G4G5T4T5	<b>S</b> 1
	Cardamine douglassii	Purple Bittercress			HL	G5	S2

ris					
Cardamine pratensis var. palustris	Meadow Cuckoo-flower		HL	G5T5	S3
Carex bebbii	Bebb's Sedge		HL	G5	S2
Carex brunnescens	Round-spike Brownish Sedge	E	LP, HL	G5T5	S1
Carex buxbaumii	Brown Sedge		HL	G5	S3
Carex disperma	Soft-leaf Sedge		HL	G5	S1
Carex haydenii	Cloud Sedge	E	LP, HL	G5	S1
Carex leptonervia	Fine-nerve Sedge	E	LP, HL	G4	S1
Carex limosa	Mud Sedge	E	LP, HL	G5	S1
Carex louisianica	Louisiana Sedge	E	LP, HL	G5	S1
Carex pallescens	Pale Sedge		HL	G5	S2
Carex polymorpha	Variable Sedge	E	LP, HL	G3	S1
Carex prairea	Prairie Sedge		HL	G5?	S2
Carex retrorsa	Retrorse Sedge		HL	G5	S2
Carex siccata	Hillside Sedge	E	LP, HL	G5	S1
Carex typhina	Cat-tail Sedge		HL	G5	S3
Carex utriculata	Bottle-shaped Sedge		HL	G5	S2
Castilleja coccinea	Scarlet Indian-paintbrush		HL	G5	S2
Cercis canadensis	Redbud	E	LP, HL	G5T5	<b>S</b> 1
Chenopodium simplex	Maple-leaf Goosefoot		HL	G5	S2
Clematis occidentalis var. occidentalis	Purple Clematis		HL	G5T5	S2
Coeloglossum viride var. virescens	Long-bract Green Orchid		HL	G5T5	S2
Corallorhiza trifida	Early Coralroot		HL	G5	S2
Cornus canadensis	Bunchberry		HL	G5	<b>S</b> 1
Crataegus dodgei	Dodge's Hawthorn		HL	G4	S2
Cuphea viscosissima	Blue Waxweed		HL	G5?	S3
Cuscuta cephalanthi	Buttonbush Dodder	E	LP, HL	G5	S1

Cynoglossum virginianum var. virginianum	Wild Comfrey			HL	G5T5	S2
Cypripedium reginae	Showy Lady's-slipper E		LP, HL	G4	S1	
Desmodium humifusum	Trailing Tick-trefoil E		E	LP, HL	G1G2Q	<b>S</b> 1
Dirca palustris	Leatherwood			HL	G4	S2
Doellingeria infirma	Cornel-leaf Aster			HL	G5	S2
Elatine americana	American Waterwort			HL	G4	S2
Elatine minima	Small Waterwort			HL	G5	S3
Epilobium angustifolium ssp. circumvagum	Narrow-leaf Fireweed			HL	G5T5	S1
Epilobium strictum	Downy Willowherb			HL	G5?	S2
Equisetum pratense	Meadow Horsetail E		Е	LP, HL	G5	S1
Equisetum variegatum	Variegated Horsetail E		E	LP, HL	G5T5	S1
Eriophorum gracile	Slender Cotton-grass		E	LP, HL	G5TNR	SH
Eriophorum tenellum	Rough Cotton-grass		E	LP, HL	G5	S1
Eriophorum vaginatum var. spissum	Sheathed Cotton-grass		E	LP, HL	G5T5	SH
Eriophorum viridicarinatum	Thin-leaf Cotton-grass			HL	G5	S3
Galium palustre	Marsh Bedstraw			HL	G5	S3
Glyceria grandis	American Manna Grass		E	LP, HL	G5T5	S2
Gnaphalium macounii	Winged Cudweed		E	LP, HL	G5	SH
Gymnocarpium dryopteris	Oak Fern			HL	G5	S1
Helonias bullata	Swamp-pink	LT	E	LP, HL	G3	S3
Hemicarpha micrantha	Small-flower Halfchaff Sedge E		E	LP, HL	G4	S1
Hieracium kalmii	Canada Hawkweed E		E	LP, HL	G5TNR	S1
Hottonia inflata	Featherfoil		E	LP, HL	G4	S1
Ilex montana	Large-leaf Holly		E	LP, HL	G5	S1
Juncus brevicaudatus	Narrow-panicle Rush			HL	G5	S2

Kalmia polifolia	Pale-laurel	E	LP, HL	G5	<b>S</b> 1
Ledum groenlandicum	Labrador Tea		HL	G5	<b>S</b> 1
Lemna trisulca	Star Duckweed		HL	G5	S2
Lilium philadelphicum var. philadelphicum	Wood Lily		HL	G5T4T5	S2
Lobelia dortmanna	Water Lobelia	E	LP, HL	G4	SH
Lupinus perennis	Wild Lupine		HL	G5	S3
Lycopodiella inundata	Northern Bog Club-moss		HL	G5	S1
Lycopodium annotinum	Stiff Club-moss	Е	LP, HL	G5	S1
Lysimachia hybrida	Lowland Loosestrife		HL	G5	S3
Lysimachia thyrsiflora	Tufted Loosestrife		HL	G5	S3
Malaxis bayardii	Bayard Long's Adder's-mouth	E	LP, HL	G2	SH
Malaxis unifolia	Green Adder's-mouth		HL	G5	S2
Melanthium virginicum	Virginia Bunchflower	Е	LP, HL	G5	S1
Menyanthes trifoliata	Buck-bean		HL	G5	S2
Milium effusum	Tall Millet Grass	E	LP, HL	G5	SH.1
Mimulus alatus	Winged Monkey-flower		HL	G5	S3
Muhlenbergia glomerata	Eastern Smoke Grass		HL	G5	S2
Myriophyllum verticillatum	Whorled Water-milfoil	E	LP, HL	G5	SH
Nuphar microphyllum	Small Yellow Pond-lily	E	LP, HL	G5T4T5	SH
Nymphoides cordata	Floatingheart		LP, HL	G5	S3
Obolaria virginica	Virginia Pennywort		HL	G5	S2
Panicum boreale	Northern Panic Grass	E	LP, HL	G5	S1
Pedicularis lanceolata	Swamp Lousewort		HL	G5	S3
Phegopteris connectilis	Northern Beech Fern		HL	G5	S2
Phlox pilosa	Downy Phlox	E	LP, HL	G5T5	SH

Picea rubens	Red Spruce	E	LP, HL	G5	<b>S</b> 1
Platanthera ciliaris	Yellow Fringed Orchid		LP, HL	G5	S2
Platanthera flava var. herbiola	Tubercled Rein Orchid		HL	G4T4Q	S2
Platanthera hookeri	Hooker's Orchid	Е	LP, HL	G5	SH
Platanthera psycodes	Purple Fringed Orchid		HL	G5	S2
Polygala polygama	Racemed Milkwort		HL	G5	S2
Populus heterophylla	Swamp Cottonwood		HL	G5	S2
Potamogeton alpinus	Northern Pondweed	E	LP, HL	G5	<b>S</b> 1
Potamogeton illinoensis	Illinois Pondweed	E	LP, HL	G5	<b>S</b> 1
Potamogeton obtusifolius	Blunt-leaf Pondweed	E	LP, HL	G5	<b>S</b> 1
Potamogeton robbinsii	Robbin's Pondweed	E	LP, HL	G5	S2
Potamogeton zosteriformis	Eel-grass Pondweed	E	LP, HL	G5	<b>S</b> 1
Potentilla arguta var. arguta	Tall Cinquefoil		HL	G5TNR	S2
Potentilla palustris	Marsh Cinquefoil	E	LP, HL	G5	SH
Prenanthes racemosa	Smooth Rattlesnake-root	E	LP, HL	G5TNR	SH
Prunus alleghaniensis	Allegheny Plum	E	LP, HL	G4T4	SH
Prunus pumila var. depressa	Low Sand Cherry		HL	G5T5	<b>S</b> 1
Pycnanthemum torrei	Torrey's Mountain-mint	E	LP, HL	G2	<b>S</b> 1
Ranunculus ambigens	Water-plantain Spearwort		HL	G4	S2
Ranunculus fascicularis	Early Buttercup	E	LP, HL	G5	<b>S</b> 1
Ranunculus flabellaris	Yellow Water Buttercup		HL	G5	S3
Ranunculus pusillus var. pusillus	Low Spearwort		HL	G5T4?	S2
Ranunculus trichophyllus var. trichophyllus	Thread-leaf Water Buttercup		HL	G5T5	S2
Rhododendron canadense	Rhodora	Е	LP, HL	G5	S1
Salix candida	Hoary Willow		HL	G5	S2

Salix lucida ssp. lucida	Shining Willow		HL	G5T5	S1
Salix pedicellaris	Bog Willow	E	LP, HL	G5	<b>S</b> 1
Salix serissima	Autumn Willow		HL	G4	S2
Scheuchzeria palustris	Arrow-grass	E	LP, HL	G5T5	SH
Selaginella rupestris	Rock Spike-moss		HL	G5	S2
Smilacina trifolia	Three-leaf False Solomon's-seal	E	LP, HL	G5	<b>S</b> 1
Solidago rigida	Prairie Goldenrod	E	LP, HL	G5T5	S1
Sparganium angustifolium	Narrow-leaf Burr-reed	E	LP, HL	G5	SH
Sparganium minimum	Small Burr-reed	E	LP, HL	G5	S1
Sphenopholis pensylvanica	Swamp Oats		HL	G4	S2
Spiranthes lucida	Shining Ladies'-tresses		HL	G5	S2
Sporobolus neglectus	Small Rush-grass	E	LP, HL	G5	<b>S</b> 1
Stachys hyssopifolia	Hyssop Hedge-nettle		HL	G5	S2
Stachys tenuifolia	Smooth Hedge-nettle		HL	G5	S3
Stellaria borealis	Boreal Starwort	E	LP, HL	G5T5	<b>S</b> 1
Tiarella cordifolia	Foamflower	E	LP, HL	G5T5	<b>S</b> 1
Triadenum fraseri	Fraser's St. John's-wort		HL	G4G5	S3
Triphora trianthophora	Three Birds Orchid	E	LP, HL	G3G4	<b>S</b> 1
Trollius laxus ssp. laxus	Spreading Globe Flower	E	LP, HL	G4T3	S1
Utricularia gibba	Humped Bladderwort		LP, HL	G5	S3
Utricularia intermedia	Flat-leaf Bladderwort		HL	G5	S3
Utricularia purpurea	Purple Bladderwort		LP, HL	G5	S3
Vaccinium oxycoccos	Small Cranberry		HL	G5	S2
Verbena simplex	Narrow-leaf Vervain	E	LP, HL	G5	S1
Viburnum opulus var. americanum	Highbush-cranberry		HL	G5T5	S3

County: Morris							
		Viola blanda var. palustriformis	Large-leaf White Violet		HL	G4G5T4T5	S3
		Viola canadensis	Canadian Violet	E	LP, HL	G5TNR	S1
		Viola hirsutula	Southern Wood Violet		HL	G4	S2

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# **Appendix G:**

# Sample Environmental Impact Statement Ordinance From Borough of Far Hills

- A. An Environmental Impact Statement (EIS) is required as part of any application for development involving new buildings or any land disturbance which requires approval of the Planning Board.
- B. Contents of EIS. The EIS shall discuss and analyze those factors required for the particular project as provided in subsection E. and any other factors pertinent to the project. Where the information is provided elsewhere in the application, it may be incorporated by reference. The applicant may request a preapplication conference with the Planning Board to discuss the scope and detail of the EIS, and the Planning Board may seek the advice of the Environmental Commission in determining said scope and detail. The EIS shall address each of the items outlined below to the degree and extent it is pertinent to the project. In preparing the EIS, the applicant may utilize resource information available from the Borough.
- C. The following information shall be submitted in accordance with the requirements of subsection E. as to the scope of the proposed project:
  - (1) Plan and description of proposed project: A project description, complete with site plans, which shall specify the purpose of the proposed project, including products and services, if any, being provided, and the regional, municipal and neighborhood setting, including current land use of the project site and properties within five hundred (500) feet of the site.
  - (2) Inventory of existing natural resources: Generally, an inventory will consider the air quality, topography, surface water bodies, surface water quality, aquatic biota, soils, geology, groundwater, vegetation, wildlife, archaelogical and historical features and the presence of wetlands. Forest vegetation is to be classified by type and age class. The distribution of types and classes will be indicated on a map, the scale of which will be one. (1) inch equals one hundred (100) feet or such other scale as may be required. The location, species and diameter at four and one half (4 1/2') feet above the ground of all isolated trees four (4") inches or more in diameter are to be shown on the same or on a separate map.
- D. Assessment of environmental impact of project: An assessment supported by environmental data of the environmental impact of the project upon the factors described in subsection C.2. above, and specifically the following:
  - (1) Wastewater management. An estimate of the expected quantity and type of wastewater from the proposed development. If disposal is on site, discuss the relation to topography, soils, wetlands and underlying geology, including water table, aquifer recharge areas and all wells within five hundred feet (500) of the disposal areas; include results of percolation tests and soil logs required by ordinance.
    - If disposal is to an existing private facility or to a public facility, identification, owner and location of the plant and location of the existing collection point to which the proposed project would be connected. Documentary evidence that the expected flows from the proposed facility will be accepted and can be treated adequately by the private or public facility must accompany the environmental impact statement.

The applicant should demonstrate compliance with all applicable state, county and Borough health regulations.

(2) Water supply. If the water is to be supplied from the site and a flow of one hundred thousand (100,000) gallons per day or less is required, an impact assessment of water supply is required if the anticipated demand exceeds the available safe yield of the aquifer *contained* within the property limits indicated in the Borough's resource inventory. In such case the applicant must substantiate and explain the anticipated demand, present proof that the aquifer contained within the property limits can yield the desired amount of water, demonstrate that wells proposed for installation will meet acceptable standards and assess the effect of proposed withdrawals on existing and proposed wells and surface water bodies within the geologic formation. If the plan includes fifty (50) or more dwelling units, certification of the adequacy of the proposed water supply and sewerage facilities must be obtained from the New Jersey Department of Environmental Protection and must be included in the EIS.

If the water is to be supplied from any existing private or public facility, the identification, owner and location of the facility and the location of existing distribution point to which the proposed project would be connected shall be provided. The applicant will submit documentary proof that the facility has the available excess capacity in terms of its allowable diversion and equipment to supply the proposed project and is willing to do so. The applicant must demonstrate to the satisfaction of the Planning Board that the total consumption of groundwater from on-site and off-site sources will not exceed the available safe yield of the aquifer contained within the property limits.

- (3) Surface drainage and stormwater management. Discussion of the stormwater management plan to be submitted in accordance with Section 915 and compliance with the provisions of that Section.
- (4) Stream corridors. A description and map of any streams and immediate environs, steep banks, springs and wetlands and streamside vegetation located on the property, in accordance with the standards of Article VIII concerning stream corridors, and evidence of compliance with these standards. Include a map depicting the floodway and flood hazard area as reflected on flood hazard area delineation maps on file with the Borough, along with evidence of compliance with Section 906. The applicant shall supply copies of all resource information provided to the Division of Water Resource in support of an application for any required encroachment permit.
- (5) Solid waste disposal. Estimate the volume of solid wastes, by type, including excess earth, expected to be generated from the proposed project during construction and operation and describe plans for collection, storage, transportation and disposal of these materials; identify the location(s), type(s) and owner(s) of the facility (facilities) which will receive such solid wastes; demonstrate compliance with the requirements of the Statewide Mandatory Source Separation and Recycling Act.
- (6) Air quality. Describe each source, its location, the quantity and nature of materials to be emitted from any furnace or other device in which coal, fuel oil, gasoline, diesel fuel, kerosene, wood or other combustible material will be burned, or if any other source of air pollutants, including automobiles attracted by the facility, will be present on the site during or after construction. Evidence of compliance with any applicable state and federal regulations shall accompany the EIS. If a state or federal

- emission permit is required, a copy of all resource data submitted with the application for the permit shall also accompany the EIS.
- (7) Noise. A statement of anticipated effects on noise and vibration levels, magnitude and characteristics related to on-site activities and proposed method(s) of control. Background levels of noise throughout the anticipated area affected must be determined. Any applicant for industrial and commercial enterprises must show that after construction and during normal operation the enterprise will not exceed the State of New Jersey regulations controlling industries and commercial stationary sources (N.J.A.C. 7:29-1.1 et seq.).
- (8) Traffic. Determine the present traffic volume and capacity of the road(s) serving the project and the nearest major intersection; calculate the traffic generated by the proposed project and any increase in background levels during the course of the project's completion; set forth projected volumes for roads and intersections upon completion of the project, and compare the projected level of service (LOS) to the existing LOS; and, describe traffic control measures that will be incorporated to mitigate the impact.
- (9) Community impact. An analysis of the factors affecting the finances of the Borough, which shall include a comparison of the estimated tax receipts and fiscal outlay for municipal services; estimated number and types of jobs to be provided; calculation of the number of school-age children to be produced; and, any addition to existing municipal services rendered by the project.
- (10) Visual impact. Discuss how the natural or present character of the area will be changed as a result of the proposed development, and the steps taken to mitigate the impact.
- (11) Artificial light. A statement of anticipated effects on light, magnitude and characteristics related to onsite activities and proposed methods of control, with particular attention to the control of sky glow.
- (12) Critical and environmentally sensitive area. Quantify and discuss the impact on critical areas, including stream corridors, wetlands and slopes greater than fifteen percent (15%); and environmentally sensitive areas, including highly erodible soils, areas of high water table, mature stands of native vegetation, aquifer recharge and discharge areas and other environmentally sensitive features, areas, or conditions not addressed elsewhere in the EIS. The analysis should include a quantification of predevelopment and post-development conditions on the site.
- (13) Energy conservation. A description of the site in terms of its physical orientation to solar access and prevailing winds, addressing the building and site design and arrangement in terms of energy efficient principles and maximum utilization of renewable energy sources.
- (14) Environmental protective measures. The EIS shall contain a listing of all environmental protective measures which will be used should the proposed project be implemented. These are measures which will avoid or minimize adverse effects on the natural and man-made environment of the site and region during the construction and operation of the facility.

- (15) Adverse impacts which cannot be avoided. The EIS shall contain a summary list, without discussion, of the potential adverse environmental impacts which cannot be avoided should the proposed project be implemented. Short-term impacts should be distinguished from irreversible impacts. Any impacts on critical areas, which include but are not limited to streams, floodways, wetlands, slopes of fifteen percent (15%) or greater; and environmentally sensitive areas, which include but are not limited to highly erodible soils, areas of high water table, aquifer recharge areas and mature stands of native vegetation, should specify the type of criteria involved and the extent of similar areas which will not be affected.
- (16) Summary environmental assessment. The EIS shall contain a concise summary of the environmental impact assessment for the proposed project. This summary will evaluate the adverse and positive environmental effect of the project should it be implemented and the public benefits expected to derive from the project, if any.
- (17) Permits. List any permits required for this project from federal, state, local, or other governmental agencies, including the name of the issuing agency, whether the permit has been applied for, and if so, the date of the application, whether the application was approved or denied (include date) or is pending, and the number of the application or permit.
- E. Environmental impact statement requirements shall be specific to the scale of the project, as follows:

		Residential				
		1 and 2	3 to 9	9 10 or more	Non-	
EIS I	tem (Sec. 904)	lots	lots	lots	Residential	
C.1	Description of project		X	X	X	
C.2	Inventory of existing natural resources		X	X	X	
D.1	Wastewater management			X	X	
D.2	Water supply	X	X	X	X	
D.3	Surface drainage	X	X	X	X	
D.4	Stream corridors	X	X	X	X	
D.5	Solid waste disposal			X	X	
D.6	Air quality				X	
D.7	Noise		X	X	X	
D.8	Traffic			X	X	
D.9	Community impact			X	X	
D.10	Visual impact			X	X	
D.11	Artificial lighting			X	X	
D.12	Critical areas	X	X	X	X	
D.13	Energy conservation		X	X	X	
D.14	Environmental protection		X	X	X	
	measures					
D.15	Adverse impacts		X	X	X	
D.16	EIS summary		X	X	X	
D.17	Permits	X	X	X	X	

- F. Planning Board review. In reviewing an EIS the Planning Board shall take into consideration the effect of the proposed project upon all aspects of the environment, including but not limited to sewage disposal, water quality, water supply, preservation of trees and vegetation, protection of watercourses, protection of air resources, protection of aquifers, protection of public lands and their uses and ecosystems and the avoidance of any nuisance factors. The Planning Board will submit the EIS for review to the Environmental Commission and may submit such statement to such other governmental bodies and to such consultants as it may deem appropriate. The Planning Board shall request that an advisory report shall be made to it by the governmental body or consultant within forty-five (45) days of the submission of the EIS to such governmental body or consultant. The Planning Board shall reject the proposed project on an environmental basis, if it can reasonably determine that the proposed project:
  - (1) Will result in appreciable harm to the environment or to the public health and safety;
  - (2) Has not been designed with a view toward the protection of natural resources; and
  - (3) Will place any excessive demand upon the total resources available for such project and for any future project.
- G. Conditions. The steps to be taken to minimize the adverse environmental impacts during construction and operation and the alternatives which may be approved by the Planning Board shall constitute conditions of the approval of the EIS, together with such other conditions as the Planning Board may impose. No certificate of occupancy shall be issued until compliance shall have been made with such conditions.

# Appendix H: Stream Inspection Reports

In response to a request from the Pequannock Township Council, the Pequannock Environmental Commission started inspecting township streams and ditches in 2008. The purpose of these ongoing inspections is to document the condition of the streams and to note issues such as potential desnagging requirements (e.g., the presence of trees or other debris in the waterways that could potentially inhibit flow and contribute to flooding), potential problems with culverts and backflow-prevention gates, general litter levels in and around the waterways, general access issues that may be of concern for a clean-up operation, and other potential issues. Each report focuses on a particular stream and includes the following:

- (1) a brief summary of the inspection and major findings
- (2) an overview map showing the location of all photos taken during the inspection
- (3) key photographs with notations

In accordance with the Council's request, the Pequannock Environmental Commission began inspecting streams in Pequannock in November 2008. Winter is the best time for the inspections, which are made difficult by vegetative overgrowth. This appendix includes the Environmental Commission's stream inspection reports completed in the 2008/2009 winter season. It is anticipated that additional reports will be added as they are completed.

#### Memorandum

Date: December 22, 2008

From: Tom Newman, Chair, Environmental Commission

To: Pequannock Town Council

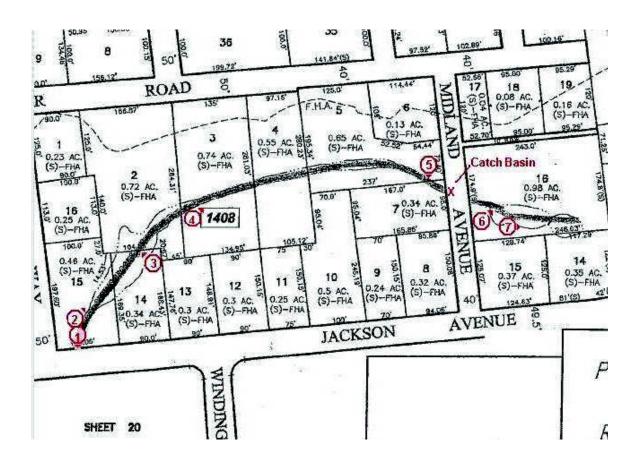
**RE:** Stream Inspection of Spring Brook North of Jackson Ave.

When: Sunday, December 14, 2008 2pm-4:30pm Where: Spring Brook, North of Jackson Ave

#### **Summary:**

The headwaters of Spring Brook occur at the ponds at Block 1408, Lot 16 (between Midland Avenue and the Saturn Dealer). Water apparently flows west under Midland Avenue, although the flow path here is not clear. Spring Brook continues west and southwest through private properties before crossing under Jackson Avenue just west of Winding Way. Litter levels were generally low, with higher concentrations of litter along Jackson Avenue.

A location map showing photograph locations and several highlight photos of the inspection follow. A complete log of photographs appears at the end of this memo. A copy of all corresponding photographs is provided on an accompanying CD.



Highlight #1: (Photo 08) Pond East of Midland Ave, at small dam (upper pond appears to be concrete lined).



Highlight #2: (Photo 07) Pond outlet pipe at east side of Midland Avenue.



Highlight #3: (Photo 06) Spring Brook, West Side of Midland Ave.

(Looking south at location of outlet of pipe crossing under Midland Avenue. Outlet not visible, may be obstructed with soil, leaves and sticks; slow flow is evident at pictured location. Location of catch basin on Midland Ave may mark pipe crossing location.)



Highlight #4: (Photo 04) One of Several Private Footbridges Crossing Spring Brook



Highlight #5: (Photo 02) View of Spring Brook Looking North From Jackson Ave.





#### Complete Listing Of Inspection Photos Spring Brook, North of Jackson Ave (Dec 14, 2008)

- 01 Looking downstream (south) through culvert under Jackson Ave. Clear except for possible obstruction at far end.
- 02 Looking upstream (north/northeast) toward island and bend. Some trash along sidewalk in brush and in brook.
- 03 Detail of island at bend. Birch tree has fallen over and has been tied off to prevent tree from falling. Birch on near shore is in water.
- 04 One of several bridges across the stream.
- 05 Looking south at location of outlet of pipe crossing under Midland Avenue. Outlet not visible, may be obstructed with soil, leaves and sticks; slow flow is evident at pictured location.
- 06 Same location as above, showing proximity of house (Block 1408 Lot 7).
- \*NOTE: location of catch basin on Midland Ave may mark pipe crossing location.
- 07 Pond on east side of Midland Ave, showing pond outlet pipe.
- 08 Pond of east side of Midland Ave, at small dam. Upper pond is concrete lined.

#### Memorandum

Date: December 6, 2008

From: Tom Newman, Chair, Environmental Commission

To: Pequannock Town Council

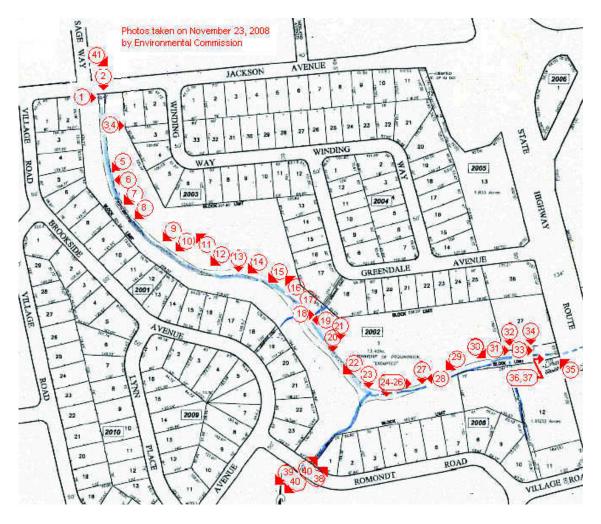
RE: Stream Inspection of Spring Brook West of Rt 23 and South of Jackson Ave

When: Sunday, November 23, 2008 1:00pm-2:30pm

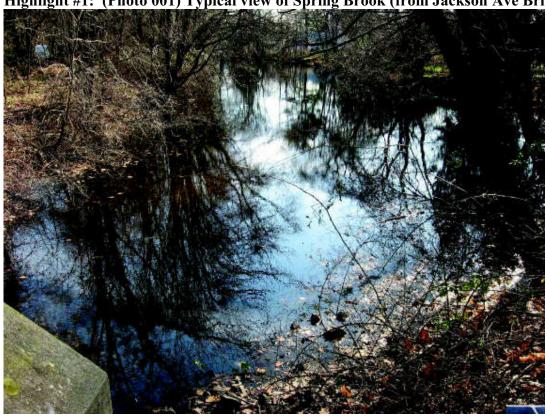
Where: Spring Brook, from Jackson Avenue south along the eastern shoreline to Rt. 23.

**Summary**: Spring Brook appeared to be in generally good and free-flowing condition, although there were two locations with evidence of submerged trees and/or debris that could inhibit flow in the stream. The backflow prevention valves just upstream of the Rt. 23 culvert, as well as the Rt. 23 culvert itself, were clear. With respect to litter/trash, minimal amounts were observed along most of the length of Spring Brook; with higher concentrations in the water and along the banks in the 100 to 200 ft upstream of Rt. 23.

A map of the inspected portion of the stream follows. The map indicates the location and orientation of the photographs taken during the inspection. Several highlight photos of the inspection follow. A complete log of photographs appears at the end of this memo.



Highlight #1: (Photo 001) Typical view of Spring Brook (from Jackson Ave Bridge)



Highlight #2: (Photo 021) Spring Brook, just downstream of Greendale Ave Ditch



Highlight #3: (Photo 011) Clear Portion Of Walking Path along Spring Brook



Highlight #4: (Photo 016) Yard Waste Debris Pile along Path beside Spring Brook



Highlight #5: (Photo 017) Spring Brook Obstructions (upstream of Greendale Ditch)

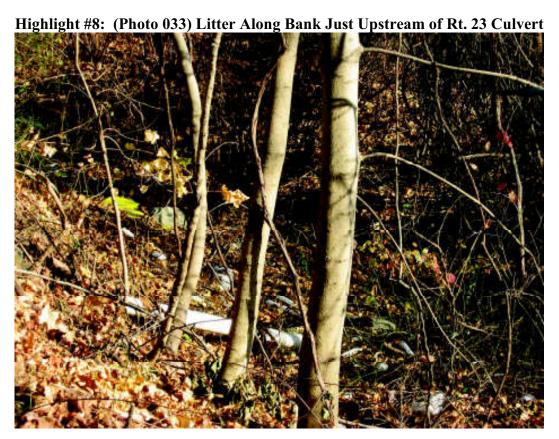


Highlight #6: (Photo 025) Shrubs & Trees in Spring Brook, just downstream of Romondt Ditch



Highlight #7: (Photo 032) Debris in Spring Brook Just Upstream of Rt. 23.





Highlight #9: (Photo 035) Backflow Preventers Just Upstream of Rt. 23 Culvert



# Photo Log (all photos taken from eastern shore of Spring Brook except as noted.) Photo locations and orientation annotated on Map, page 1.

- 001 from Jackson Ave bridge, western shore toward eastern shore.
- 002 from Jackson Ave bridge, western shore toward downstream.
- 003 yard waste debris pile, near Block 2003, corner of Lots 1 and 3.
- 004 yard waste debris pile, near Block 2003, corner of Lots 1 and 3. Take 2.
- 005 large yard waste debris pile completely across path and to waterline.

Approximately adjacent to Block 2203, Lot 4 or 5.

- 006 waterfront patio (western shore) Block 2001, Lot 7? (on township land)
- 007 tree down (eastern shore) opposite Block 2001, Lot 8/9?
- 008 tree submerged (western shore) opposite Block 2001, Lot 9?
- 009 tree down (eastern shore) opposite Block 2001 Lot 11/12?
- 010 tree down (eastern shore) Block 2001 Lot 12?
- 011 path (looking north from approximately opposite of Block 2001 Lot 12
- 012 eastern shoreline, hemlock tree falling into water, Block 2001 Lot 15/16?
- 013 eastern shoreline, dead trees in water, trash (pool ladder, etc) near Block 2001 Lot 16/17?
- 014 -- western shoreline, patio furniture dumped in water, opposite Block 2001 Lot 17/18?
- 015 log/tree submerged in water and trees in water on eastern shoreline, opposite Block 2001 Lot 18?
- 016 debris pile on western shoreline, near Block 2003 Lot 17? (just upstream of ditch)
- 017 congested portion of stream, with submerged trees (note evidence of congestion in photo: leaves and ice), just upstream of ditch Block 2003 Lot 17/18

- 018 Ditch feeding stream from east side, looking east (Block 2003 corner of Lot 17/18)
- 019 from just downstream of ditch on eastern shoreline, looking upstream at congested area. Can see ditch from west side entering stream.
- 020 looking downstream from bench (see photo 021)
- 021 bench (opposite Block 2001 Lot 20)
- 022 looking east up right of way between Block 2001 Lot 23 and Block 2008 Lot 1. Looks swampy from this distance.
- 023 possible entrance of Romondt Ditch to stream (just downstream of photo 022). Block 2008 Lots 1&2.
- 024/25/26 Panoramic view of downed trees, from north/east side to south/west side, Block 2008 Lot 5/6.
- 027 trees/bushes in water, south/west side Block 2008 Lot 6.
- 028 trees/bushes in water, north/east side opposite Block 2008 Lot 6.
- 029 debris along path/water (metal siding?) from north/east side, looking westward.
- 030 brush in water, Block 2008, Lot 9/12.
- 031 debris in water adjacent to Block 2008, Lot 12.
- 032 debris (tire, trash) along shoreline and in water adjacent to Block 2008, Lot 12.
- 033 trash along northern shoreline adjacent to Block 2008 Lot 27.
- 034 debris (pipe, logs, trash) in water adjacent to Block 2008 Lot 12.
- 035 flap valve at outlet of Spring Brook, just upstream of culvert under Rt 23 (not shown in this photo). Note flap valves are chained open; this reduces the upstream water level. If the downstream Pompton River were to flood, the flap gates would be allowed to close to prevent water from the Pompton River from backing up into Spring Brook.
- 036 -- view through culvert under Rt 23 (looking east/downstream)
- 037 view through culvert under Rt 23 (looking east/downstream)
- 038 looking north from Romondt Ave along Romondt Ditch toward Spring Brook.
- 039 looking south from Romondt Ave along Romondt Ditch; catch basin
- 040 looking south from Romondt Ave along Romondt Ditch
- 041 looking north from Romondt Ave along Romondt Ditch; catch basin
- 042 northern side of Jackson Ave bridge over Spring Brook (from Sage Way)

### Memorandum

Date: December 7, 2008

From: Tom Andrea, Secretary, Environmental Commission

To: Pequannock Town Council

RE: Stream Inspection of Spring Brook East of Rt. 23

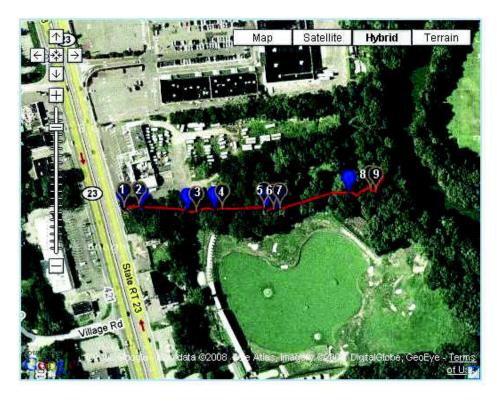
When: Sunday, December 7, 2008 Approximately 1:30pm-2:30pm

Where: Spring Brook, East of Rt. 23.

**Summary:** Note: the following is an edited version of the original text. The original text and photos may be found online at: <a href="http://www.everytrail.com/view\_trip.php?trip\_id=86759">http://www.everytrail.com/view\_trip.php?trip\_id=86759</a>

This inspection of Spring Brook is from Route 23 to the Pompton River. The biggest problems are near the end of the stream by the river. There are a couple of large trees that have fallen in the stream. These appear to be impeding the flow on the stream. When the inspection was conducted, there was no major problem but in a high-flow situation flow could be blocked. These trees should be removed to improve the flow of the stream. The best access to this area is from behind the Honda dealership and there seems to be ATV-type trail in the area. All along the stream, a general clean-up would be beneficial. There are some spots with high banks where dead and fallen trees could be removed to improve flow in the stream as the water level in the stream increases.

A location map showing photograph locations and several highlight photos of the inspection follow. A copy of all corresponding photographs is provided on an accompanying CD.



Highlight #1: (Photo 01) Spring Brook Culvert At Rt. 23 (Note trash)



Highlight #2: (Photo 02) Spring Brook, Steep Banks



Highlight #3: (Photo 03) Spring Brook, Shallower Bank (Note tire)



Highlight #4: (Photo 04) Steeper Banks With Debris



Highlight #5: (Photo 05) Evidence Flow Overtops Bank Here



Highlight #6: (Photo 06) Narrow Stream Bed with High Banks (Note stump)



Highlight #7: (Photo 07) Narrow Stream Bed with High Banks and Trees



Highlight #8: (Photo 08) Large Tree Stumps Partially In Stream



Highlight #9: (Photo 09) Large Tree Trunk, Debris In Flow Path Near Pompton River



# Memorandum

Date: December 22, 2008

From: Tom Newman, Chair, Environmental Commission

To: Pequannock Town Council

RE: Stream Inspection of Romondt Ditch

When: Sunday, December 14, 2008 4:00pm-5:00pm

Where: Romondt Ditch

**Summary**: Romondt Ditch primarily flows south toward Meyer's Brook. However, the northern portions of the ditch can flow north toward Spring Brook, and in high water conditions, it appears that flow can travel in either direction.

There is a large tree and several large branches across the main channel of flow. These may cause flow to back up locally several feet upstream (north) in higher flow conditions. It is recommended that these logs be cut and/or cleared.

Litter levels were generally low, with higher concentrations of litter around Romondt Street. Debris including litter as well as vegetative yard waste was also observed along the rear of the homes along the western side of the ditch.

A location map showing a key to photo numbers, and several highlight photos of the inspection follow. A complete log of photographs appears at the end of this memo. A copy of all corresponding photographs is provided on an accompanying CD.



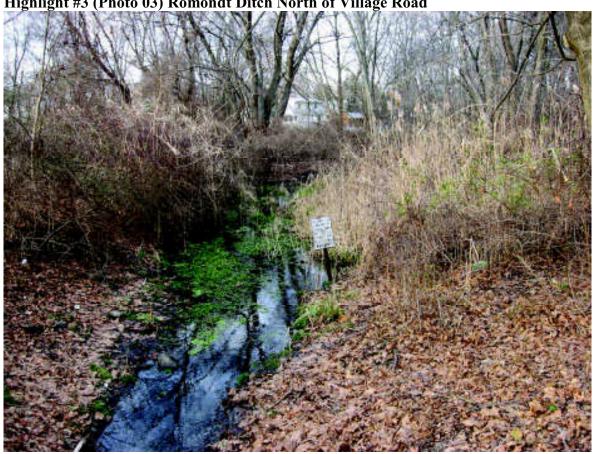
Highlight #1 (Photo 01) Romondt Ditch at South End (Village Road / Meyer's Brook)



Highlight #2: (Photo 02) Romondt Ditch South from Village Road (note dead tree leaning to left over the ditch)



Highlight #3 (Photo 03) Romondt Ditch North of Village Road







Highlight #5 (Photo 08) Branches and Debris in Romondt Ditch



Highlight #6 (Photo 10) Household Yard Waste Piles, West Side of Romondt Ditch



Highlight #7 (Photo 11) Downed Trees, Timbers and Stumps in Romondt Ditch



Highlight #8 (Photo 13) Romondt Ditch Just South of Romondt Ave



Highlight #9 (Photo 17) Standing Water Between Romondt Ditch and Spring Brook (Possible evidence of poor connection between Romondt Ditch and Spring Brook)



# Complete Photo Log for Romondt Ditch Inspection (Dec 14, 2008)

- 01 From south of Village Road (Meyer's Brook), looking north toward Village Road culvert. Note large dead tree on west side of stream leaning against another tree. If this tree falls, there will be an obstruction. (also see next photo)
- 02 From Village Road looking south toward Meyers Brook. Note large dead tree on west side dead tree being held up by vines and small live trees. If this tree falls, it will likely obstruct the stream.
- 03 From Village Road looking north. There is substantial ponding north of this point, the culvert provides limited drainage.
- 04 Looking south toward Village Road. Soil has been added to park property recently at this location. No evidence of plant growth here, and potential erosion and silting up of waterways.
- 05 Looking upstream at Romondt Ditch typical section. Areas have ponding either side (especially east side) of stream.
- 06 Looking downstream. Dead branches in waterway: these are hanging from live branches but could be pulled down. They are now obstructing flow and catching trash (tire, plastic bottle, etc.)
- 07 Looking downstream. Stream crossing constructed of boards that do obstruct the flow somewhat, and cause debris to collect (see large plastic jug, other items).

- 08 Looking upstream. Much debris in stream: fallen trees, branches, boards, trash. In a storm, this debris could easily be pushed together to form a large obstruction to flow. Material should be removed.
- 09 Looking upstream. Location of ditch feeding Romondt Ditch from the west; typical of section in this reach. Can see large tree fallen across Romondt Ditch upstream.
- 10 Looking upstream. Yard waste deposited on park property behind houses. Leaves, logs, tarps, etc. Can see large tree down across stream upstream in photo.
- 11 Looking downstream adjacent to Lot 4. Large tree down across stream is obstructing flow and allowing materials such as leaves, branches, boards, etc. to collect. Homeowner (Lot 4) claims items have washed downstream to this point; however, this homeowner has encroached upon park property by placing a shed and other materials on park land.
- 12 Looking downstream from Lot 2. Area is congested with material such as leaves, branches, some trash, etc. Some branches have fallen from trees and/or been deposited by homeowners.
- 13 Looking upstream from Lot 2 toward culvert at Romondt Ave. Less water here ground seems a bit higher.
- \*NOTE: Nov 23 inspection of Spring Brook included two photos of Romondt Ditch from Romondt Road see photos 039-041 by T.Newman.
- 14 Near Romondt Road, neighboring house's garbage can had been dumped over spilling trash into Romondt Ditch.
- 15 Looking north toward Spring Brook, Romondt Ditch "low spot" features realatively wide ponded area with reeds as pictured.
- 16 Looking east, another even larger ponded area that runs parallel to Spring Brook for roughly 100 yards. This area appears to be chronically wet.
- 17 Looking west from same spot as photo 16. Shows similar feature.
- \*\*Note: if the area shown in Photos 16 and 17 is chronically wet, this might explain residents' complaints RE odors, insects, etc.

# Memorandum

Date: December 22, 2008

From: Tom Newman, Chair, Environmental Commission

To: Pequannock Town Council

RE: Stream Inspection of Romondt Ditch

When: Sunday, December 14, 2008 4:00pm-5:00pm

Where: Romondt Ditch

**Summary**: Romondt Ditch primarily flows south toward Meyer's Brook. However, the northern portions of the ditch can flow north toward Spring Brook, and in high water conditions, it appears that flow can travel in either direction.

There is a large tree and several large branches across the main channel of flow. These may cause flow to back up locally several feet upstream (north) in higher flow conditions. It is recommended that these logs be cut and/or cleared.

Litter levels were generally low, with higher concentrations of litter around Romondt Street. Debris including litter as well as vegetative yard waste was also observed along the rear of the homes along the western side of the ditch.

A location map showing a key to photo numbers, and several highlight photos of the inspection follow. A complete log of photographs appears at the end of this memo. A copy of all corresponding photographs is provided on an accompanying CD.



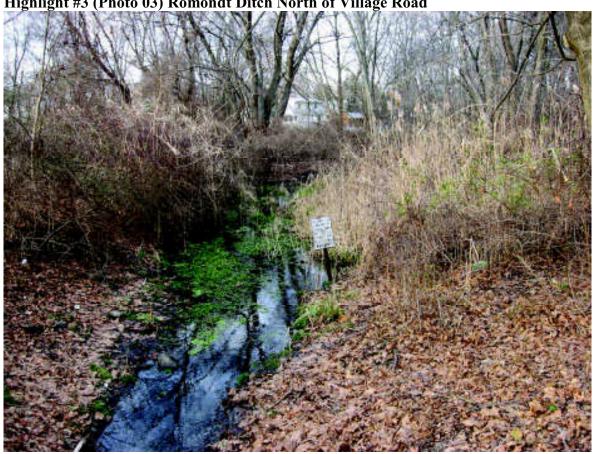
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Highlight #2: (Photo 02) Romondt Ditch South from Village Road (note dead tree leaning to left over the ditch)



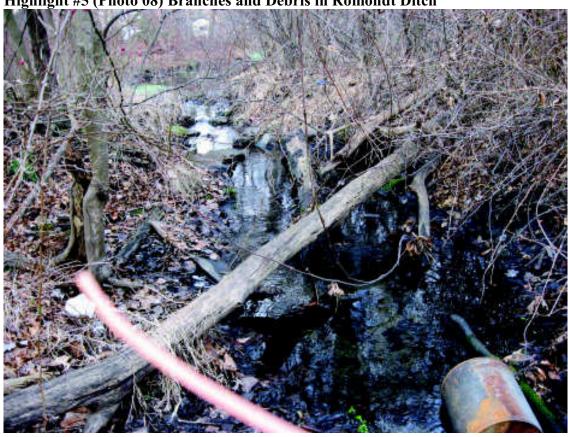
Highlight #3 (Photo 03) Romondt Ditch North of Village Road







Highlight #5 (Photo 08) Branches and Debris in Romondt Ditch



Highlight #6 (Photo 10) Household Yard Waste Piles, West Side of Romondt Ditch



Highlight #7 (Photo 11) Downed Trees, Timbers and Stumps in Romondt Ditch



Highlight #8 (Photo 13) Romondt Ditch Just South of Romondt Ave



Highlight #9 (Photo 17) Standing Water Between Romondt Ditch and Spring Brook (Possible evidence of poor connection between Romondt Ditch and Spring Brook)



# Complete Photo Log for Romondt Ditch Inspection (Dec 14, 2008)

- 01 From south of Village Road (Meyer's Brook), looking north toward Village Road culvert. Note large dead tree on west side of stream leaning against another tree. If this tree falls, there will be an obstruction. (also see next photo)
- 02 From Village Road looking south toward Meyers Brook. Note large dead tree on west side dead tree being held up by vines and small live trees. If this tree falls, it will likely obstruct the stream.
- 03 From Village Road looking north. There is substantial ponding north of this point, the culvert provides limited drainage.
- 04 Looking south toward Village Road. Soil has been added to park property recently at this location. No evidence of plant growth here, and potential erosion and silting up of waterways.
- 05 Looking upstream at Romondt Ditch typical section. Areas have ponding either side (especially east side) of stream.
- 06 Looking downstream. Dead branches in waterway: these are hanging from live branches but could be pulled down. They are now obstructing flow and catching trash (tire, plastic bottle, etc.)
- 07 Looking downstream. Stream crossing constructed of boards that do obstruct the flow somewhat, and cause debris to collect (see large plastic jug, other items).

- 08 Looking upstream. Much debris in stream: fallen trees, branches, boards, trash. In a storm, this debris could easily be pushed together to form a large obstruction to flow. Material should be removed.
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- \*NOTE: Nov 23 inspection of Spring Brook included two photos of Romondt Ditch from Romondt Road see photos 039-041 by T.Newman.
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- 15 Looking north toward Spring Brook, Romondt Ditch "low spot" features realatively wide ponded area with reeds as pictured.
- 16 Looking east, another even larger ponded area that runs parallel to Spring Brook for roughly 100 yards. This area appears to be chronically wet.
- 17 Looking west from same spot as photo 16. Shows similar feature.
- \*\*Note: if the area shown in Photos 16 and 17 is chronically wet, this might explain residents' complaints RE odors, insects, etc.

# Memorandum

Date: June 11, 2009

From: Rudy F. Steinthal, Environmental Commission

To: Pequannock Town Council

**RE:** Stream Inspection of Demott's Brook

When: Saturday, April 11, 2009 Approximately 10:30am-11:30am

Where: Demott's Brook.

# **Summary:**

This inspection of Demott's Brook was from Route 23, just north of Tiffs to the property adjacent to "McDonalds" Beach. The biggest problems involve instances where debris has fallen, or been dumped into the stream, as noted under the labeled pictures. When the inspection was conducted, there was no major problem but, in a high-flow situation the debris could impede the flow and therefore should be removed to improve the flow of the stream. The best access to this area is from the northern corner of the parking area north of Tiffs' parking lot. All along the stream, a general clean-up would be beneficial. There are some spots with high banks where dead and fallen trees could be removed to improve flow in the stream as the water level in the stream increases.

A location map showing photograph locations and several highlight photos of the inspection follow. Please note that Jefferson Street ends at Greenwood Avenue and that Marlin Avenue ends at Madison Avenue, with no physical connection between Jefferson Street and Marlin Avenue.

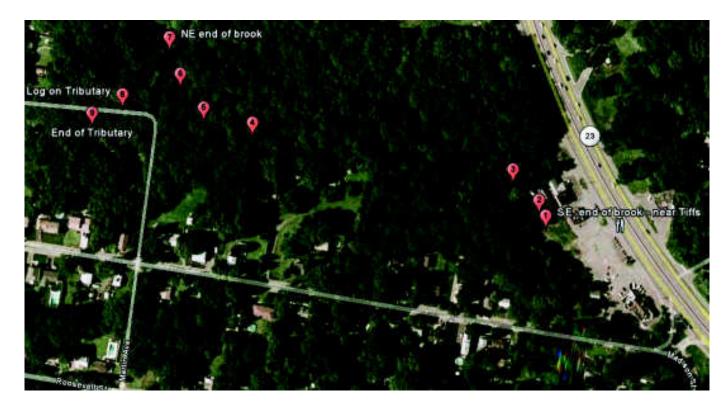


Photo #1 -- N40° 57' 09.04" W074° 16' 49.3" Southeast end of brook (near Tiffs), view looking south (toward Tiffs parking lot.



Photo #2 -- N40° 57' 09.5" W074° 16' 49.6" Southeast end of brook (near Tiffs). Needs some clean up. View is looking North of photo #1



Photo #3 -- N40° 57' 10.4" W074° 16' 50.7" View from West bank of brook.



Photo #4 -- N40° 57' 11.5" W074° 17' 01.3". Object should be removed. View from South to North.



Photo #5 -- N40° 57' 11.9" W074° 17' 03.3". Debris has to be removed. View from West bank of brook.

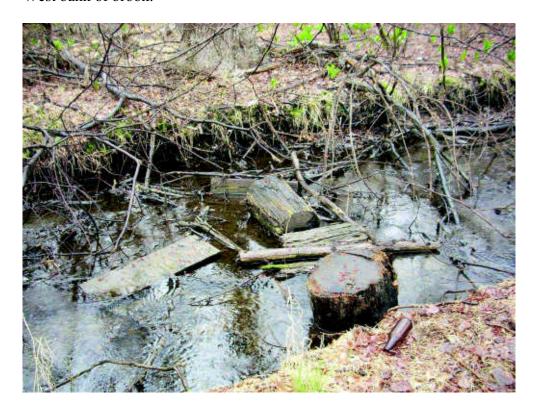


Photo #6 -- N40° 57' 12.9" W074° 17' 04.3". More debris to be removed. View from West bank of brook looking North.



Photo #7 -- N40° 57' 14.0" W074° 17' 04.8" Northeast end of brook (adjacent to McDonalds Beach). Trees have to be removed from brook, to insure proper flow.



Photo #9 -- N40° 57' 11.6" W074° 17' 07.8" End of tributary.

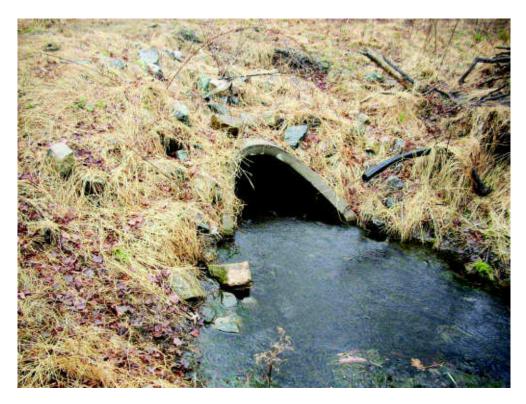
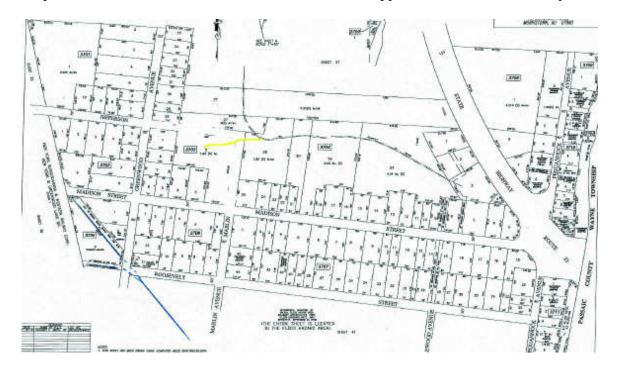


Photo #8 -- N40° 57' 12.2" W074° 17' 06.6" Log on tributary.



Map indicates route of Demott's Brook. Yellow line is approximate route of tributary.



# **Appendix I:**

# **Historic Site Data for Pequannock Township**

Data in this appendix was obtained from the website of the Morris County Geographic Information System Services website, maintained by the County of Morris Department of Planning and Development at <a href="https://morrisgis.co.morris.nj.us/">https://morrisgis.co.morris.nj.us/</a>. This website contains a wealth of information on the historic homes of Morris County. For information on this site, or help in accessing this information, please use the following contact information:

County of Morris
Department of Planning & Development
GIS Services
30 Schuyler Place, 4th Floor
P.O. BOX 900
Morristown, NJ 07963-0900

Phone: (973) 829-8120

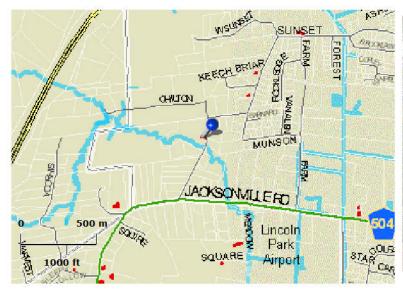
Email: mcgis@co.morris.nj.us

# **Historic Site Report**

Feature Name: G. M. Van Ness House

Common Name: G. M. Van Ness House

Inventory Number: 1431-0020 Acroterion Number: 1431-020





**Picture** 

Map Location

### **LOCATION AND SURROUNDINGS**

Address: 320 SUNSET RD

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: CARBONE, MICHAEL G & ALLISON M Ownership Type: Private

Ownership Info: Kiefle Highlands: PLAN AREA

Siting and Related Structures: Landscaping and view from circular drive down a slope is picturesque. The building sits at an angle to and in

close proximity to the road. A clapboard barn on the property in 1986 was not noted during the 2006 survey.

Surrounding Environment: Residential Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1850 To 1850 Source of Date: 1853 map; field observation

Date Comments: 1850 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Long, narrow rectangle with center entry

Builder:nullFoundation:StoneStyle Type:VernacularElements Type:Colonial

Primary Style: null Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 1.5

Influence: null Number of Bays: 6

**Style Comments:** Possible originally exhibited Dutch traits.

**Exterior Wall Fabric:** Uncoursed Fieldstone w/ brownstone auoins. Roof / Chimney(s): Side gable roof clad in asphalt shingles; stone and brick exterior chimney; brick interior chimney; 2 brick exterior chimneys Fenestration: 1/1 wood double-hung sash windows; dormer has three paired 4/4 double-hung sash windows; some vinyl replacements; two 12-light windows in gable end; one round window in the side of the dormer; also a cameo window on the 1st floor gable end Additional Architectural House has been much altered with circa 1980 Colonial Revival detailing including oval windows on gable end, Description: gabled entry porch flanked by bay windows, and new paneled shutters. The wing on the far side of the house is shingled; it dates to circa 1985. The property is identified as "GM Van Ness" on an 1853 map, but as HD Bush on the 1868 map, in the same approximate location. According to the Acroterion survey, Reynolds Pond once lay southwest of the house, and a sawmill powered by it stood across Sunset Road to the east. Significance: The antiquity of this house has been largely masked by application of 20th-century high style Colonial Revival trim and construction of a large new wing, thus reducing its architectural significance a considerable degree. It is not a significant example of its original vernacular form, and is not known to be the work of a master (Criterion C). It is not known to be associated with significant individuals or events in the history of Pequannock, the state, or the nation (Criteria A and B), and is not likely to be able to provide information important in history or prehistory (Criterion D). It is not eligible for the National Register.

# Municipal ID: Morris County Historic Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): SHPO Opinion: Multiple Resource Area (MRA): Determination of Eligibility (DOE):

**ASSOCIATED SURVEYS** 

Certification of Eligibility (COE): Historic American Building Survey
(HABS):

State Register (SR): Historic American Engineering Record (HAER):

Delisted Info: World Heritage Site (WHS):

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**INSPECTION DATA** 

# Demolished Demo Date: null Integrity: Low Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events B associated with prominent individuals Contribution to district: null O outstanding example of its period or style

Related Theme: null

Feature Comments: null

Survey References: Lightfoot and Gill, 1853 Map of Morris County,

p provides information important to history

Beers, F.W., 1868 Atlas of Morris County.

Other Documentation: null

# Currently Viewing Survey Data 2 of 2

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: P. J. Slingerland House

Common Name: P. J. Slingerland House

Inventory Number: 1431-0021 Acroterion Number: 1431-021





Map Location

**Picture** 

## LOCATION AND SURROUNDINGS

Address: 280 SUNSET RD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: DEAK, JUDITH A Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures: In 1986, a collection of outbuildings including a small stable, barn, garage and privy, were noted on the

property. These were not visible during the 2006 survey. There is an asphalt driveway adjacent to the house.

The building sits on a large, raised lot in a sparsely developed section of Pequannock.

Surrounding Environment: Scattered Buildings

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1860 To 1860 Source of Date: Historic maps

Date Comments: 1860 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Single-pile plan; main block with rear ell

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: Gothic

Primary Style: null Elements Status: Remain

Secondary Style: null Details Status: Removed

Tertiary Style: null Number of Stories: 2.5

Influence: Gothic Number of Bays: 4

Style Comments: null

Page 1 of 3

Roof / Chimney(s): Side gable roof clad in asphalt shingles with projecting eaves and box cornice; brick end chimney

Fenestration: 2/2 wood double-hung sash windows with shutters

## Additional Architectural

Carpenter Gothic-influenced porch with hipped roof and turned posts. Rear wing has gable roof. Wood window Description: and door surrounds. Rear ell appears to have parged raised basement. Operable shutters have been removed since 1986.

The size and configuration of this house suggest this may have been a tenants house, but nothing seems to be known locally about its associative history. The property is possibly indicated as "J Slingerland" on an 1853 map, but as PJ Slingerland on an 1868 map in the same approximate location.

This building is an example of vernacular construction; it is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals, as no information is known about PJ Slingerland and his contributions to Pequannock (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

## ACCOCTATED CUDVEVS

	ASSOCIATED SURVEYS	
R):	National Register (NR):	Municipal ID:
Historic Landmark (NHL)	National Histor	Morris County Historic Preservation Element 1976:
AA):	Thematic Nomination (TRA):	SHPO ID:
tA):	Multiple Resource Area (MRA):	SHPO Opinion:
PS):	Multiple Property Submission (MPS):	Determination of Eligibility (DOE):
	Historic American Building Survey (HABS):	Certification of Eligibility (COE):
	Historic American Engineering Record (HAER):	State Register (SR):
IS):	World Heritage Site (WHS):	Delisted Info:

# **INSPECTION DATA** Demolished Demo Date: Integrity: High Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: District feature is within: null associated with specific events B associated with prominent individuals Contribution to district: null outstanding example of its period or style provides information important to history Related Theme: null Feature Comments: null Survey References: Lightfoot and Gill, 1853 Map of Morris County, Beers, F.W., 1868 Atlas of Morris County.

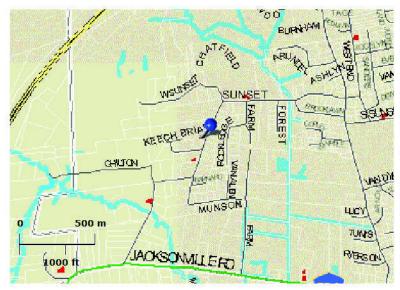
Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: J. Beach House

Common Name: J. Beach House

Inventory Number: 1431-0022 Acroterion Number: 1431-022





Map Location

**Picture** 

## **LOCATION AND SURROUNDINGS**

Address: 260 SUNSET RD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: WILSON JR, A EDWARD & LINDA Ownership Type: Private

Ownership Info: Edward Wilson Highlands: PLAN AREA

In 1986, the outbuildings included a frame cow barn, calf barn, corn crib, creamery, cement cold storage structures structures built into a hillside, and a frame garage. These structures appear to span the period 1890-1930.

structure built into a hillside, and a frame garage. These structures appear to span the period 1890-1930. They were not visible during the 2006 survey because of overgrowth and their placement on the lot. In front of the

house stands a cobblestone well. The land opposite on Sunset Road was once part of the dairy farm.

Surrounding Environment: Scattered Buildings

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1860 To 1860 Source of Date: Map evidence; field observations

Date Comments: 1860 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Center entry

Builder: Inull Foundation: Combination

Style Type: Vernacular Elements Type: Greek

Primary Style: null Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 1.5

Influence: Greek Number of Bays: 5

Style Comments: Vernacular

## Page 1 of 3

Exterior Wall Fabric: Wood siding

Roof / Chimney(s): Cross gable roof with 1 brick interior chimney

Fenestration: 2/2 wood double-hung sash in enclosed porch on second floor; 6/6 wood double-hung sash in basement level;

8/12 wood double-hung sash in main block; 8-light casement in gable end

Additional Architectural

Description:

Centered in front of gable is a 2-story flat-roofed entry bay with paneled reveals and double leaf doors between 8/8 windows, likely a later addition. Based on information provided by owner (1986), the North bays seem to be earlier, with poplar floors and boxed staircase. An enclosed porch is located on the southern gable end. Based on 1986 and 2006 survey data, the 8/12 windows appear to have been installed sometime between these two surveys, replacing 6/6 double-hung sash windows.

History:

According to the Acroterion survey, the embanked setting and features of the north wing (including pegged construction) suggest the possibility of 18th-century construction, but the exterior has been altered, and the map sequence is ambiguous. In 1853, a "J. Beach" owned property in this approximate location, but no house seems depicted on the map. On the 1868 map, "Jno. Beach" owns a house at the same location. The Beach family appears to have been prominent in the Rockaway area, and a Nathaniel Beach was a founding member of the Newark and Mount Pleasant Tumpike Company in 1806. Nothing is known about the J. Beach who, according to map evidence, owned this property.

According to Acroterion, in the 1880s the owners took in summer boarders under the name "Florida House." During the 20th century until 1957, the property was a thriving dairy farm where H. P. Beam kept Guernsey cattle on extensive pasturage. It is unknown whether the property still supports a working farm.

Significance:

This house is associated with the Mandeville family, a prominent early family in the Lincoln Park area, but there is no evidence that Giles Mandeville made significant contributions to the history of Pequannock (Criterion B). The dwelling is not associated with significant events in the history of Pequannock (Criterion A). It is unlikely to be able to provide information important in history or prehistory (Criterion D).

This house is a significant example of the Dutch Colonial style in Morris County. It has distinctive details, and represents a transitional style of stone construction. The building has retained its original wood windows, operable shutters, and fieldstone exterior, as well as its basic original form. This dwelling is eligible for the National Register per Criterion C.

## **ASSOCIATED SURVEYS**

Municipal ID:	National Register (NR):
Morris County Historic Preservation Element 1976;	National Historic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):
SHPO Opinion:	Multiple Resource Area (MRA):
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):
certification of Eligibility (COE):	Historic American Building Survey (HABS):
State Register (SR):	Historic American Engineering Record (HAER):
Delisted Info:	World Heritage Site (WHS):

# **INSPECTION DATA** Demolished Demo Date: null Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null associated with prominent individuals Contribution to district: null outstanding example of its period or style provides information important to history Related Theme: null Feature Comments: Foundation Combination-Rubblestone at rear, and brick at front. Survey References: Interview with owner, Edward Wilson (1986); Munsell, 1882.

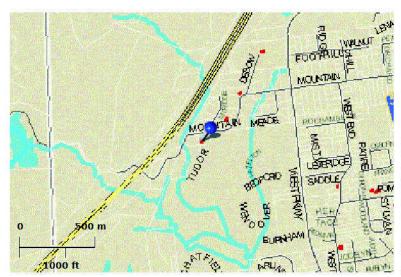
Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 4 2007 12:00AM	E. Burling	KSK	

Feature Name: Ackerson/Mead/Clark House #1

Common Name: Ackerson-Clark House

Inventory Number: 1431-0048 Acroterion Number: 1431-052





Map Location Picture

## LOCATION AND SURROUNDINGS

Address: 183 MOUNTAIN AVE

Owner at time of survey: WILKINSON III, K J & TAMBURIN, D F

Municipality: Pequannock Zip Code: 07440

Ownership Info: Mr. & Mrs. Adams Highlands: PLAN AREA

The first fi

Siting and Related Structures:

New wings, landscaping, decks, swimming pool, and statuary are blatantly inappropriate to historic architecture

Ownership Type: Private

and setting (1986).

Surrounding Environment: null Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1830 To 1830 Source of Date: Route 287 Report

Date Comments: 1830 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Center hall

Builder: null Foundation: Combination

Style Type: Revival Elements Type: Greek

Primary Style: Other Elements Status: Remain

Tertiary Style: null Number of Stories: 2.0

Influence: Greek Number of Bays: 5

Style Comments: Classic Revival

Exterior Wall Fabric: Synthetic siding

Roof / Chimney(s): Steep hipped roof with large gabled portico; hipped dormer

Fenestration: 1/1 vinyl double-hung sash windows with snap-in dividers; inoperable shutters

Description:

Additional Architectural A 3-car garage was attached to the rear circa 1985.

History: The original portion of the building dates to between 1830-1840, with alterations made in the 1870s, 1920s, and 1970s. In 1853, the property was identified as being owned by John Ackerson. According to a Route 1-287 Historic Architecture report, this building was "built by a Mr. Ed Clark during the early part of the 20th Century... It commands a view to the east over the "Bog and Vly" and all of Pompton Plains." This was likely when major alterations were made, especially the large portico with full-height columns.

Significance:

According to an NJ HPO eligibility determination in 1981, this building is eligible on architectural and historical grounds, and "can be assumed to be eligible also on the gound (sic) of their potential to yield archaeological information."

However, a prior opinion in 1978 stated that the building had lost integrity as a result of "Extensive changes," and was not eligible. The 1986 Acroterion analysis, after the 1981 eligibility determination, recommends the property to be not eligible. It is likely that additional changes have been made in the ensuing 20 years, however, the 2006 survey team was not able to fully view this property in the field. Despite the existing NJ HPO eligibility determination, the property should be further examined to verify its status.

## ASSOCIATED SURVEYS

Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)	
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

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## **INSPECTION DATA**

Demolished	Demo Date:	null		
Integrity:	Medium			
Threats to Feature:	Alterations			
National Register Eligibility:	Undetermined			
Criteria of Eligibility:				
A associated	l with specific e	events	District feature is within:	null
B associated	with prominen	t individuals	Contribution to district:	null
outstanding	g example of it	s period or style		
provides in	nformation impo	rtant to history		
Related Theme:	null			

Feature Comments: null

Survey References: Lightfoot and Gill, 1853 Map of Morris County.

Route I-287 Alternate 1 Environmental Study, 12/80

Other Documentation: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 4 2007 12:00AM	E. Burling	KSK	

Feature Name: Henry DeBow House

Common Name: Henry DeBow House

Inventory Number: 1431-0047 Acroterion Number: 1431-051





Map Location

**Picture** 

## **LOCATION AND SURROUNDINGS**

Address: 170 MOUNTAIN AVE

Municipality:PequannockZip Code:07440Owner at time of survey:DEANS, ANNOwnership Type:Private

Ownership Info: Mr. & Mrs. John Filippelli Highlands: PLAN AREA

Siting and Related Structures:

At the side of the property near the driveway is a small wood outhouse. The house site is wooded and raised.

There are no other outbuildings visible on the property.

Surrounding Environment: Scattered Buildings

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1890 To 1890 Source of Date: Field observation

Date Comments: 1890 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Originally 3-bay single pile

Builder: null Foundation: Stone
Style Type: Vernacular Elements Type: Greek
Primary Style: Greek Elements Status: Remain
Secondary Style: Revival Details Status: Remain

Tertiary Style: null Number of Stories: 2.0

Influence: Greek Number of Bays: Multiple

Style Comments: Vernacular later Greek Revival alterations.

Exterior Wall Fabric:	Clapboard
Roof / Chimney(s):	Side gable roof with boxed cornice and projecting eaves; 2 brick end chimneys; brick interior chimney
Fenestration:	6/6, 4/4, 6/1, 2/2 wood double-hung sash; 4-light wood casements; irregular fenestration across façade
Description:	Oldest wing seen at the rear corner of the house, shows exposed brick fireback, flanked by narrow 6/6 windows, 2 small 6-paned windows above and a gable roof. The house was raised and built out so that the front entry is now a Greek Revival door which is actually part of the 3-bay wing with wall dormer added to the front. Attached to another 3-bay wing with porch carried on Doric columns.  According to Pequannock Township, this house dates to the early 18th century, and the Greek Revival entry is
	an 1840s era addition. According to early maps, the property was owned by Henry DeBow.
Significance:	According the NJ HPO, this building is not eligible for the National Register. As of 1978, the integrity was lost. The HPO believed, and Acroterion concurred, that the building formed a district with the other DeBow houses on this street. However, this house is "not of National Register quality," unlike the nearby Paul DeBow and Paul Barney DeBow houses, which have been deemed eligible for the National Register.

## **ASSOCIATED SURVEYS Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: Thematic Nomination (TRA): SHPO ID: **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): Historic American Building Survey (HABS): State Register (SR): Historic American Engineering Record (HAER): **Delisted Info:** World Heritage Site (WHS):

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: Lightfoot and Gill, 1853 Map of Morris County;

Other Documentation: null

## Currently Viewing Survey Data 2 of 2

http://www.pequannocktownship.org/documents/historic/harrydebow.htm;

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 5 2007 12:00AM	E. Burling	KSK	

Feature Name: Jess Van Ness House

**Common Name:** Jess Van Ness House

Inventory Number: 1431-0023 Acroterion Number: 1431-023





**Picture** 

Ownership Type: Private

Map Location

## LOCATION AND SURROUNDINGS

Address: 204 SUNSET RD

Owner at time of survey: SMITH, JOHN E & LYNNE

Municipality: Pequannock **Zip Code:** 07440

Ownership Info: Highlands: PLAN AREA null

Siting and Related Structures: House sits within a few feet of road behind a row of large trees. Outbuildings include 2 frame buildings and a

privy.

Surrounding Environment: Scattered Buildings Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Residential Single-Unit Residential Single-Unit Original Use: Present Use:

**Construction Date Range:** 1890 To 1890 Source of Date: Map sequence

Date Comments: 1890 +/-

Additional Alteration Year: null

Side-hall, single pile with rear shed Form/Plan Type: Architect: null

addition

Builder: null Foundation: Cement

Style Type: Vernacular **Elements Type:** null

Primary Style: null **Elements Status:** Remain

Secondary Style: null Details Status: Remain

Number of Stories: 2.0 Tertiary Style: null

Influence: null Number of Bays: 3

Style Comments: Vernacular

Page 1 of 3

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Exterior Wall Fabric:	Clapboard
Roof / Chimney(s):	Side gable roof clad in asphalt shingles; exterior brick chimney
Fenestration:	2/2 double-hung sash with louvered shutters on all floors; single leaf entrance
Additional Architectural Description:	Shed roof porch with turned posts has been partially enclosed to provide weather entry.
History:	The Van Ness family owned property here since at least 1853, when they had a house further to the northwest. The present day house and outbuilding complex does not appear in their current location the 1887 map.
Significance:	null
	ACCOCIATED CUDVEVE

#### ASSOCIATED SURVEYS

	7,000027722	
Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic Landn	nark (NHL)
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

# **INSPECTION DATA** Demolished Demo Date: Integrity: High Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: District feature is within: null associated with specific events B associated with prominent individuals Contribution to district: null outstanding example of its period or style provides information important to history Related Theme: Agriculture Feature Comments: null Survey References: NJ HPO Section 106 Consultation Comments on Route 287 Project, 1978; Robinson, 1887 Atlas of Morris County

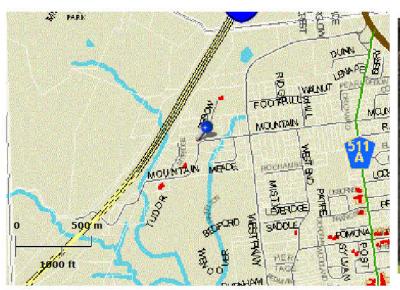
Other Documentation: null

Survey Date	Survey Person	Organization
Mar 7 1986 12:00AM	R. Guter	Acroterion
Apr 1 2007 12:00AM	E. Burling	KSK

Feature Name: Paul Debow House

Common Name: Paul Debow House

Inventory Number: 1431-0046 Acroterion Number: 1431-050





Map Location Picture

## **LOCATION AND SURROUNDINGS**

Address: 150 MOUNTAIN AVE

Municipality:PequannockZip Code:07440Owner at time of survey:CRANE, JODY & EDWIN BAKER HARTOwnership Type:Private

Ownership Info: Sandra Perry Highlands: PLAN AREA

Siting and Related Structures:

The grade rises behind the house on a wooded hillside. A frame house stands at the front, and to the north is

an early 20th-century gambrel-roofed barn.

Surrounding Environment: Open Space, Scattered Buildings, Woodland Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1850 To 1875 Source of Date: Field observation; map evidence

Date Comments: 1850-1875 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Side hall, double pile, with wing

Builder: null Foundation: Stone, Stucco Covered

Style Type:VernacularElements Type:ItalinatePrimary Style:ItalinateElements Status:Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Italinate Number of Bays: 5

Style Comments: Vernacular Italianate

Exterior Wall Fabric:	Clapboard
Roof / Chimney(s):	Side gable roof with projecting eaves and brackets; 2 chimneys - one in main block, one in addition.
Fenestration:	6/6, 2/2 and 1/1 double-hung sash windows; 6/6 appear to be vinyl double-hung sash with snap-in dividers.
Additional Architectural Description:	House is semi-embanked; larger wing has 3-bay side hall double pile over high basement. Smaller wing is two bay with a centered bay on lower level. This wing has a shed addition at the rear. The two-story porch is elaborated with square posts on paneled piers, jigsawn balustrade and jigsawn cornice brackets. The rear and side walls are covered in synthetic siding.
History:	null
Significance:	According to the DOE for this property, the Paul DeBow House is eligible for the National Register as "a locally important example of a residence that exhibits a primarily mid-19th century Italianate style appearance while incorporating portions of an earlier structure dating from the late 19th century."

ASSOCIATED SURVEYS		
Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)	
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

## **INSPECTION DATA**

Demolished	Demo Date: null		
Integrity:	Medium		
Threats to Feature:	No Threat		
National Register Eligibility:	Eligible		
Criteria of Eligibility:			
A associated	with specific events	District feature is within:	null
B associated	with prominent individuals	Contribution to district:	null
outstandir	g example of its period or s	style	
D provides in	nformation important to his	tory	
Related Theme:	null		

Survey References: Lightfoot and Gill, 1853 Map of Morris County.

Route I-287 Alternate 1 Environmental Study, 12/80.

Other Documentation: null

Feature Comments: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: Paul Barney DeBow House

Common Name: Paul Barney DeBow House

Inventory Number: 1431-0045 Acroterion Number: 1431-049





Map Location Picture

## LOCATION AND SURROUNDINGS

Address: 134 MOUNTAIN AVE

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: THIMMEL, WILLIAM & MARIANNE Ownership Type: Private

Ownership Info: R.C. Belyea Highlands: PLAN AREA

Siting and Related Structures: sits on large acreage of farmland and woodland in a protected setting. Because the building sits at the end of

a long, private drive, it is difficult to see details of the building and outbuildings; much of the description above is from the 1986 survey and the SHPO opinion. Survey in 2006 was accomplished from the public right-of-way.

There are no outbuildings that survive near the house, but some later barns exist along the drive. The house

Surrounding Environment: Woodland, Scattered Buildings

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1880 To 1880 Source of Date: Map and field observation

Date Comments: 1880 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Center hall double-pile with 2-bay flanking

wings

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: Italinate

Primary Style: Italinate Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Italinate Number of Bays: 5

Style Comments: null

Exterior Wall Fabric:	Clapboard
Roof / Chimney(s):	Gables with boxed cornice, gable end return; 4 chimneys
Fenestration:	6/6 wood double-hung sash windows with shutters
Additional Architectural Description:	Description from 1986: The main block is typical of center gable Italianate farmhouses but without much overt Italianate detail. Double doors with raised octagonal panels are set beneath a 6-pane transom and recessed behind a paneled architrave. Square chamfered posts are set on paneled piers; balustrade is jigsaw. Attic windows have lancelet-like louvered side panels.
History:	null
Significance:	According to the DOE for this property, the Paul Barney deBow House is "a well preserved example of mid-19th century farmhouse in the Pompton Plains area. The house has additional significance as the residence of Paul Barney deBow, a locally prominent 19th century figure and successful farmer."
	ASSOCIATED SURVEYS

## **Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): Certification of Eligibility (COE): **Historic American Building Survey** (HABS): State Register (SR): Historic American Engineering Record (HAER):

World Heritage Site (WHS):

**Delisted Info:** 

		INSPECTI	ON DATA	
Demolished	Demo Date:	null		
Integrity:	High			
Threats to Feature:	No Threat			
National Register Eligibility:	Eligible			
Criteria of Eligibility:				
A associated	d with specific e	events	District feature is within:	null
B associated	d with prominen	t individuals	Contribution to district:	null
outstandir	ng example of its	s period or style		
provides in	nformation impo	ortant to history		
Related Theme:	null			

Feature Comments: null

Survey References: Lightfoot and Gill, 1853 Map of Morris County.

Route I-287 Alternate 1 Environmental Study, 12/80.

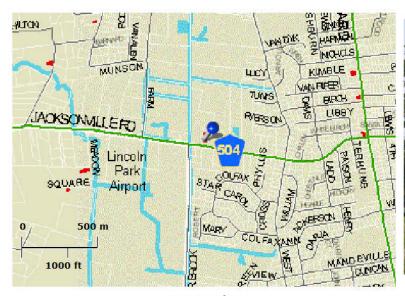
Other Documentation: null

Survey Date	Survey Person	Organization	
Jun 1 1986 12:00AM	R. Guter	Acroterion	
Apr 5 2007 12:00AM	E. Burling	KSK	

Feature Name: 144 JACKSONVILLE RD

Common Name: Grieves Farm

Inventory Number: 1431-0006 Acroterion Number: 1431-006





**Picture** 

Subdivided

Map Location

## LOCATION AND SURROUNDINGS

Address: 144 JACKSONVILLE RD

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: VAN VUGT, JOHN Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

This dwelling occupies a large lot, and sits on a raised portion. There is a large garage building to the rear.

The majority of this area is agricultural in nature, with only a few similarly aged dwellings nearby.

Surrounding Environment: Scattered Buildings

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

**Construction Date Range:** 1900 **To** 1900 **Source of Date:** Field observation; maps

Date Comments: 1900 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Center entry

Builder: null Foundation: Unknown

Style Type: Vernacular Elements Type: Dutch

Primary Style: Dutch Colonial Elements Status: Remain

Secondary Style: Revival Details Status: Remain

Tertiary Style: null Number of Stories: 1.5

Influence: Dutch Number of Bays: 3

Style Comments: null

Exterior Wall Fabric:	Stucco with clapboard gambrel ends
Roof / Chimney(s):	Side gambrel roof with flared eaves clad in asphalt shingles with 2 large gable dormers; exterior cut stone chimney
Fenestration:	6/1 wood double-hung sash windows; single leaf entrance
	Flared entry porch roof carried on 2 Tuscan columns; stone base for raised entry. Arched window frames at firs floor. Gable dormers have flared eaves.
History:	This small house with over-scaled dormers and prominent gambrel roof is possibly a 20th-century response to local Dutch vernacular architecture. The segmentally arched windows suggest an earlier house substantially altered. Maps from 1853, 1868, and 1887 do not indicate a dwelling in this approximate location, unless the map distances are erroneous and this is actually the S. Ryerson house (first appearing in 1853), radically altered.
Significance:	This building is an example of vernacular Dutch Colonial construction; it is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence tha this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and any significant individuals or significant events in the history of the Pequannock area (Criteria A and B). The building is not eligible for the National Register.
	ASSOCIATED SURVEYS

	ASSOCIATED SURVEYS
Municipal ID:	National Register (NR):
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):
SHPO Opinion:	Multiple Resource Area (MRA):
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):
Certification of Eligibility (COE):	Historic American Building Survey (HABS):
State Register (SR):	Historic American Engineering Record (HAER):

World Heritage Site (WHS):

**Delisted Info:** 

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## INSPECTION DATA

	210. 201201. 21111
Demolished	Demo Date: null
Integrity:	Medium
Threats to Feature:	Deterioration
National Register Eligibility:	Not Eligible
Criteria of Eligibility:	
A associated	d with specific events District feature is within: null
B associated	d with prominent individuals Contribution to district: null
outstandin	ng example of its period or style
D provides in	nformation important to history
Related Theme:	null
Feature Comments:	Foundation-Stucco over stone? Front porch is stone.
Survey References:	Lightfoot and Gill, 1853 Map of Morris County;

Other Documentation: null

## Currently Viewing Survey Data 2 of 2

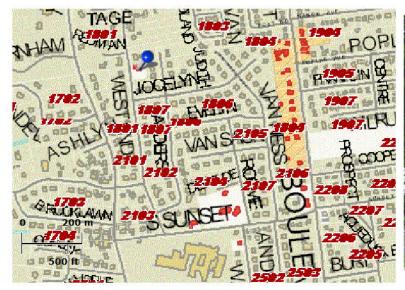
Beers, FW. 1868 Map of Morris County;

Survey Date	Survey Person	Organization	
Mar 1 1986 12:00AM	R. Guter	Acroterion	
Apr 5 2007 12:00AM	E. Burling	KSK	

Feature Name: 52 WEST END AVE

Common Name: 52 West End Avenue

Inventory Number: 1431-0029 Acroterion Number: 1431-030





Subdivided

Map Location Picture

## LOCATION AND SURROUNDINGS

Address: 52 WEST END AVE

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: BROWN, RICHARD A & LINDA P Ownership Type: Private

Ownership Info: Richard Brown Highlands: PLAN AREA

Siting and Related Structures:

null

Surrounding Environment: Residential, Suburban

ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential

**Construction Date Range:** 1890 **To** 1890 **Source of Date:** Map sequence and field observation

Date Comments: 1890 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Side hall

Builder: null Foundation: Cement

Style Type: Vernacular Elements Type: Gothic

Primary Style: null Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Gothic Number of Bays: 3

Style Comments: null

Exterior Wall Fabric:	Clapboard
Roof / Chimney(s):	Front gable roof clad in asphalt shingles with projecting eaves; 1 brick center chimney; 1 brick exterior chimney
Fenestration:	6/6, 2/2 wood double-hung sash windows; single leaf wood glazed door primary entrance
Additional Architectural Description:	Hipped roof open porch with wood brackets and turned posts. A new large wing has been added to the rear, with a gable roof, pent eave above the first floor, 8/12 windows in first story and 8/8 at the second story. A doorway there has been removed Side garage added since 1986, with 8/8 windows and a bird house in the gable end.
History:	With the exception of one of the houses, this side of West End Avenue remained undeveloped until the 19th century. This small dwelling, built circa 1890, displays Carpenter Gothic jigsawn detailing of above average quality.
	The township also stated that the front section of the house was original, with the addition dating to the 1990's.
Significance:	This dwelling is an example of early vernacular construction with notable detailing added. Nothing is known

This dwelling is an example of early vernacular construction with notable detailing added. Nothing is known about the associative history of this building, and it is unlikely to be associated with significant events or people in the history of Pequannock, the state, or the nation (Criteria A and B). It is not a significant example of its style, type, or period of construction, nor is it known to be the work of a master (Criterion C). It is not likely that this building will be able to provide information important in history or prehistory (Criterion D). This dwelling is not eligible for the National Register.

**Historic American Engineering Record** 

World Heritage Site (WHS):

(HAER):

# Municipal ID: Morris County Historic Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): SHPO Opinion: Multiple Resource Area (MRA): Determination of Eligibility (DOE): Multiple Property Submission (MPS): (HABS):

State Register (SR):

**Delisted Info:** 

**ASSOCIATED SURVEYS** 

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: null

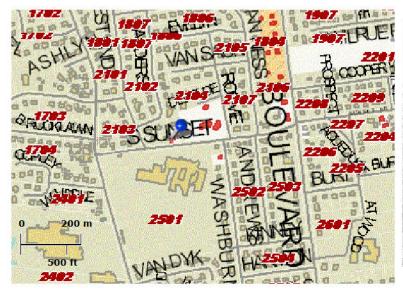
Other Documentation: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: H. Roome House

Common Name: H. Roome House

Inventory Number: 1431-0019 Acroterion Number: 1431-019





Map Location

**Picture** 

## **LOCATION AND SURROUNDINGS**

Address: 74 SUNSET RD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: RIZZUTO, ROBERT A & MARIBEL Ownership Type: Private

Ownership Info: Herforth Highlands: PLAN AREA

Siting and Related Structures:
House faces south opposite Pequannock Township High School (1986). Landscaping of house is appropriate,

stone and wood well survives on the front lawn.

Surrounding Environment: Suburban, Residential Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1850 To 1850 Source of Date: null

Date Comments: 1850 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Side hall, double pile & wing

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: null

Primary Style: null Elements Status: Unknown

Secondary Style: null Details Status: Unknown

Tertiary Style: null Number of Stories: 2.5

Influence: null Number of Bays: 6

Style Comments: Vernacular

Exterior Wall Fabric:	Vinyl siding
Roof / Chimney(s):	Gable with projecting eaves (large wing) and two interior gable-end chimneys.
Fenestration:	6/6 sash
Additional Architectural Description:	From the 1986 survey: The smaller wing now obscured by an enclosed porch appears to be relatively unaltered early 19th century house. The larger wing has a porch with turned posts and replacement piers of cement. Despite synthetic siding, integrity is good.
History:	Like the Slingerland and Van Ness Families, the Roomes were a prominent local family, with three Roomeowned houses in the immediate vicinity by the time of the Civil War. This Roome house appears on the 1853 map. Its small wing is likely earlier, and is very low in height compared to the customary wing of a local blockand-wing house. The designation "H. Roome" for this house first appears on a 1868 map of Morris County.
Significance:	

ASSOCIATED SURVEYS		
Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Histor	ic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

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## **INSPECTION DATA**

<b>✓</b> Demolished	Demo Date:	Sep 4 1988 12:00AM		
Integrity:	Low			
Threats to Feature:	No Threat			
National Register Eligibility:	Not Eligible			
Criteria of Eligibility:				
A associated	l with specific e	events	District feature is within:	null
B associated	l with prominen	t individuals	Contribution to district:	null
outstanding	g example of it	s period or style		
D provides in	nformation impo	ortant to history		
Related Theme:	null			
Feature Comments:	null			
Curvey Deferences	Lightfoot and	Cill 1952 Man of Morris	County	

**Survey References:** Lightfoot and Gill, 1853 Map of Morris County.,

Beers, F.W., 1868 Atlas of Morris County.

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Mar 24 2007 12:00AM	E. Burling	кѕк	

Feature Name: 76 HOPPER AVE

Common Name: 76 Hopper Avenue

Inventory Number: 1431-0035 Acroterion Number: 1431-037





Map Location

**Picture** 

## **LOCATION AND SURROUNDINGS**

Address: 76 HOPPER AVE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: DE GEORGE SR, ROBERT & BARBARA Ownership Type: Private

Ownership Info: Robert DeGeorge Highlands: PLAN AREA

Siting and Related Structures: Frame garage w/living quarters above stands behind house next to a modern pool. The circular drive in front is

entered through 2 cobblestone gateposts.

Surrounding Environment: null Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1906 To 1906 Source of Date: Owner (1986); field observation

Date Comments: 1906

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular massing w/central entry

Builder: null Foundation: Brick

Style Type: null Elements Type: null

Primary Style: Shingle Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.0

Influence: null Number of Bays: 5

Style Comments: Shingle

Exterior Wall Fabric:	Wood shingle
Roof / Chimney(s):	Steep cross gable roof clad in asphalt shingles; 1 interior fieldstone chimney
Fenestration:	Diamond-paned casements and vinyl 1/1 double-hung sash with snap in dividers; louvered window in gable
Additional Architectural Description:	Despite steep center gable, the prominent massing of the house produces a low horizontal impression due to long screened in porch carried on four Greek Doric columns, and further extended by long porte cochere and shingled posts. Projecting gabled entry porch with exposed rafter ends.
History:	Local informants and documentary sources shed no light on its history. Late expressions of the stick-style are uncommon in Morris County
Significance:	This building is an example of a Shingle style residence. The long steeply pitched roof line and broad eaves are characteristic of this style; however, it is missing distinctive details that would make it a significant example of its style. The screened in porch and porte cochere are likely later additions, and have somewhat reduced the building's overall integrity. It is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.
	ASSOCIATED SURVEYS

Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Histor	ic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: Robert DeGeorge, property owner (1986)

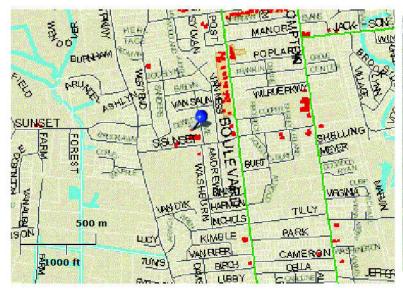
Other Documentation: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Aug 1 2007 12:00AM	E. Burling	KSK	

Feature Name: Samuel or Peter Roome House

Common Name: Samuel or Peter Roome House

Inventory Number: 1431-0024 Acroterion Number: 1431-024





Map Location

**Picture** 

## **LOCATION AND SURROUNDINGS**

Address: 60 SUNSET RD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: TRUSTEE PRESBYTERY OF JERSEY CITY Ownership Type: Private

Ownership Info: Pompton Valley Presbyterian Church Highlands: PLAN AREA

Siting and Related Structures:

The original large deep frontage of this property is now occupied by modern church buildings. A pair of large

trees still stands in front of the house, easily more than 100 years old.

Surrounding Environment: Suburban, Residential

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Educational Nursery School

Construction Date Range: 1780 To 1780 Source of Date: Acroterion survey

Date Comments: 1780 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular, single pile

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: Dutch

Primary Style: null Elements Status: Remain

Secondary Style: null Details Status: Removed

Tertiary Style: null Number of Stories: 2.0

Influence: Dutch Number of Bays: 4

Style Comments: Originally Dutch Influence.

Exterior Wall Fabric: Coursed fieldstone & clapboard

Roof / Chimney(s): Side gable roof clad in asphalt shingles with 2 interior end brick chimneys

Fenestration: Vinyl 1/1 double-hung sash windows, some with 6/1 snap-in dividers

Description:

Additional Architectural The house consists of a 2-story, 4-bay main block and a 1-story, 2-bay wing. The main block ahs a side gambrel roof, still evident after the second-story addition. Front entry obscured by modern shed-roofed wing. According to local sources (1986) the 2nd floor was added in the mid-19th century. About 1918 extensive interior and exterior alterations were carried out, bringing the house to its existing appearance.

History:

Samuel Roome married Anna Courter in 1774 and may have built the first part of this house about that time; its is likely this included the present west wing, probably originally a 1-story kitchen with attic space above. When Samuel died in 1838, the house passed to his son, Peter. Peter's son Samuel is thought to have added the second floor in the middle of the 19th century in an attempt to "modernize" this house for his daughter, Mary Eliza.

In 1918, following Mary Eliza's death, the property was acquired by a Dr. Milspaugh (or Milspaugh), who renamed the property "Sunset Farms," using it as a summer residence and a sanitarium for those with "nerve diseases," after making extensive renovations. According to the Pequannock Township planning department, these changes included enlarging the kitchen, removing partitions creating one large room on the first floor, and altering the staircase placement. The porch was also removed and rebuilt. Salvini writes that the property was used as a "halfway house" of sorts, where patients recovered and worked on the farm.

The De Wilde family, the next owners, purchased the home in 1924 and installed electricity. Currently, the Pompton Valley Presbyterian Church owns the house, which it purchased in 1958. It is currently used as a nursery school for the church.

Significance: Despite its rich associative history, the house no longer physically reflects its early and most important periods of significance. This house is not a significant example of its style or period of construction, and is not known to be the work of a prominent architect (Criterion C). It is not likely that this building will be able to provide information about history or prehistory (Criterion D). It is not associated with significant events in the history of Pequannock or the area (Criterion A). The dwelling is associated with the Roome family, and although they were large early landowners in the area, no evidence has indicated that they were significant family in the history of Pequannock or the region (Criterion B). This property is not eligible for the National Register.

## ASSOCIATED SURVEYS

Municipal ID:	National Register (NR):
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):
SHPO Opinion:	Multiple Resource Area (MRA):
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):
Certification of Eligibility (COE):	Historic American Building Survey (HABS):
State Register (SR):	Historic American Engineering Record (HAER):
Delisted Info:	World Heritage Site (WHS):

## **INSPECTION DATA**

Demolished	Demo Date: null
Integrity:	Low
Threats to Feature:	Alterations
National Register Eligibility:	Not Eligible
Criteria of Eligibility:	
A associated	with specific events  District feature is within: null
B associated	with prominent individuals Contribution to district: null
outstandin	ng example of its period or style
provides in	nformation important to history
Related Theme:	null
Feature Comments:	null
Survey References:	Lightfoot and Gill, 1853 Map of Morris County.

Ghosts of the Past: Historic Homes, Pequannock Township, Pequannock Township Planning Department, 1974;

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Mar 25 2007 12:00AM	E. Burling	KSK	

Feature Name: 51 WASHBURN RD

Common Name: 51 Washburn Road

Inventory Number: 1431-0018 Acroterion Number: 1431-018





Map Location

**Picture** 

### LOCATION AND SURROUNDINGS

Address: 51 WASHBURN RD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: POSTOYAN, VIKEN & BARBARA ANN Ownership Type: Private

Ownership Info: Eckler Highlands: PLAN AREA

Siting and Related Structures: This building sits on a large lot in a residential section of Pequannock. There is a paved driveway at the side of

the dwelling, and little landscaping. A garage was noted during the 1986 survey, but was not noted during the

survey in 2006.

Surrounding Environment: Suburban, Residential

Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential

Construction Date Range: 1850 To 1850 Source of Date: Field observation; Map evidence

Date Comments: 1850 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Irregular

Builder: null Foundation: Unknown

Style Type: Vernacular Elements Type: Other

Primary Style: Other Elements Status: Remain

Secondary Style: null Details Status: Removed

Tertiary Style: null Number of Stories: 2.5

Influence: null Number of Bays: 2

Style Comments: Semi-saltbox profile.

Exterior Wall Fabric:	Vinyl siding
Roof / Chimney(s):	Cross gable main block with salt box addition, both clad in asphalt shingles; chimneys not visible
Fenestration:	1/1 and 6/6 wood double-hung sash windows; single-leaf modern door
Additional Architectural Description:	The wing of this house with flush eaves and semi-saltbox profile suggests an early 19th c. dwelling. Attached to it is a projecting gable front wing with over-hanging eaves. There are single leaf metal doors on the street and side elevations. A 1-story shed roof proch is located on the side of the building. Faux shutters on the primary façade are a post-1986 addition. A gable hood above the door, present in 1986, has since been removed. A window has also been enclosed on the side, and a "window unit" air conditioner is in its place. Exposed rafter ends, visible in 1986, are no longer visible.
History:	Map evidence is ambiguous; a house marked "H. Mandeville" on the 1853 map and "A. Mandeville" on the 1868 map may correspond to part of this house.

**Delisted Info:** 

Significance: This building is an example of vernacular construction. It is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Historic research has suggested a connection between this house and the Mandeville family, a prominent family in Pequannock's early history. However, it is unclear which member of the family owned this property, and as a result, research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

World Heritage Site (WHS):

### **ASSOCIATED SURVEYS Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): **Historic American Building Survey** (HABS): State Register (SR): Historic American Engineering Record (HAER):

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**INSPECTION DATA** 

# Demolished Demo Date: null Integrity: Low Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history

Related Theme: null

Feature Comments: null

Survey References: Lightfoot and Gill, 1853 Map of Morris County,

Beers, F.W., 1868 Atlas of Morris County.

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 2 2007 12:00AM	E. Burling	KSK	

Feature Name: Peter Hopper House

Common Name: Peter Hopper House

Inventory Number: 1431-0030 Acroterion Number: 1431-031





Map Location

**Picture** 

### LOCATION AND SURROUNDINGS

Address: 23 POST RD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: NOTAR, ROBERT & JOAN Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

The house is surrounded by 1950s era houses, with a narrow road and sensitive landscaping. All historic

outbuildings related to this property have been lost.

Surrounding Environment: Suburban Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential

Construction Date Range: 1868 To 1882 Source of Date: Map sequence; Munsell

Date Comments: 1868-1882

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular plan with wings

Builder: null Foundation: Brick

Style Type: Revival Elements Type: Gothic

Primary Style: Gothic Elements Status: Remain

Secondary Style: Italinate Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Gothic Number of Bays: 5

Style Comments: Vernacular

Exterior Wall Fabric: Clapboard

Roof / Chimney(s): Asphalt shingle-clad cross gable roof; 3 interior end chimneys; partial cornice returns

Fenestration: 2/2 double-hung sash windows; 6/6 wood double-hung sash in gable; faux louvered shutters; double leaf

primary entrance with transom

Additional Architectural

Description:

The smaller 1 1/2-story wing with its rear ell may be earlier than the larger main block. The 1 1/2-story wing and main block each have their own entrance. The larger block is a simple well-balanced Italiante/Gothic Revival hybrid, with wood chamfered porch posts and a recessed entry with heavily molded archtrave and double-leaf door beneath a rectangular transom. The porch extends across th main block and adjacent wing. The Gothic attic window is set behind a jigsawn balcony. A 1-story, 1-bay segment is attached of the side of the 2-story wing.

History:

A drawing of the house appears in Munsell's "History of Morris County," from 1882, but no house appears mapped at this location until an 1887 map of Pequannock Township, and no other information is given about Peter Hopper. Hopper Avenue is depicted on Roome's 1876 map, but whether the house existed but was not depicted because of its irrelevance to the Boulevard is uncertain. By the last quarter of the 19th century, this center-gabled 5-bay dwelling had become a standard farmhouse type.

The 1882 image of the property depicts the house with a two-story wing at the side; many of the details still present, including a jigsawn balcony at the Gothic third floor window, are also shown in the drawing. According to Parr, the balcony could have been used "to watch horse races on the Boulevard."

Significance:

A 1978 NJ HPO opinion states that the "Hopper Farm House" is not eligible for the National Register, but it is unclear from the map with that statement whether this is the property referred to in that project.

The Hopper House is an example of a 19th-century farm dwelling that was adapted over time, incorporating earlier structures, to serve its owner's needs. This appears to be a significant architectural trend in Morris County. These buildings were often of common form, ultimately dressed in minimal Romantic Revival ornament - in this case, Gothic Revival. The dwelling is similar in style and form to the VanGelder-VanSaun house (1431-0044) on Turnpike, and similar in its growth over time to the Paul deBow house on Mountain. Avenue. The building retains a good degree of integrity. Additional research will be required to determine the construction chronology of the dwelling (Criterion C). At this time, the building is recommended potentially eligible for the National Register.

Historic research has shown a connection between this dwelling and Peter Hopper, but no additional information has been found to show that he was a significant person in the history of Pequannock or the region (Criterion B). There is also no evidence that this building is associated with significant events in the history or Pequannock, the state, or the region (Criterion A). It is not likely that this property will be able to provide information important to history or prehistory (Criterion D).

### Survey References:

Munsell's History of Morris County 1882, p. 283; NJ SHPO Consultation Comments on Route 287 project 1978. Robinson, 1887 Atlas of Morris County

### ASSOCIATED SURVEYS

Municipal ID:	National Register (NR):
Morris County Historic Preservation Element 1976;	National Historic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):
SHPO Opinion:	Multiple Resource Area (MRA):
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):
Certification of Eligibility (COE):	Historic American Building Survey (HABS):
State Register (SR):	Historic American Engineering Record (HAER):
Delisted Info:	World Heritage Site (WHS):

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### **INSPECTION DATA**

Demolished	Demo Date:	null		
Integrity:	Medium			
Threats to Feature:	No Threat			
lational Register Eligibility:	Potentially Elig	gible		
Criteria of Eligibility:				
A associated	d with specific e	events	District feature is within:	null
B associated	d with prominen	t individuals	Contribution to district:	null
outstandin	ng example of it	s period or style		
D provides in	nformation impo	ortant to history		
Related Theme:	Architecture			

Survey References: Munsell's History of Morris County 1882, p. 283;

NJ SHPO Consultation Comments on Route 287 project 1978.

Other Documentation: null

Feature Comments: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 4 2007 12:00AM	E. Burling	KSK	

Feature Name: 249 BOULEVARD

Common Name: 249 Boulevard

Inventory Number: 1431-0025 Acroterion Number: 1431-025





Map Location

**Picture** 

### **LOCATION AND SURROUNDINGS**

Address: 249 BOULEVARD

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: CHESNEY, WILLIAM R & ELLEN K Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

Remnant of large lot with mature trees along street; asphalt driveway; concrete sidewalk.

Surrounding Environment: Suburban, Residential

Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1890 To 1890 Source of Date: Field observation; maps

Date Comments: 1890 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: L plan with added wing

Builder: null Foundation: Combination

Style Type: Vernacular Elements Type: Queen Anne

Primary Style: Queen Anne Late Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: null Number of Bays: 5

Style Comments: Vernacular Queen Anne

Exterior Wall Fabric:	Vinyl siding and wood fish scale shingles		
Roof / Chimney(s):	Cross gable roof with projecting eaves; 2 interior brick chimneys		
Fenestration:	Single and grouped 1/1 vinyl double-hung sash windows with snap-in dividers; single leaf primary entrance		
Additional Architectural Description:	Open wrap-around porch with 6 wood turned posts and wood balustrades; primary and secondary entrance doors are both replacements. Set back side ell has canted first story and squared second-story overhang; overhang has dentiled border and decorative trim.		
History:	This building appears to have been built circa 1870. This property does not appear on early historic maps of Pequannock, and no information is known about its associative history.		
Significance:	Typical of vernacular Queen Anne houses built at the turn of the century, this is one of only a few examples found in Pequannock. However, alterations to the building have compromised its overall integrity, including the addition of synthetic siding and windows. The building is not a significant example of its style, period of construction, or type, and there is no evidence that it was the work of a master (Criterion C). It is not likely that the building will be able to provide information important in history or prehistory (Criterion D). It is not known to be associated with significant people or events in the history of Pequannock, the state, or the nation (Criteria A and B). This house is not eligible for the National Register.		
ASSOCIATED SURVEYS			

### **Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): Historic American Building Survey (HABS): State Register (SR): Historic American Engineering Record (HAER): **Delisted Info:** World Heritage Site (WHS):

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: Foundation Combination-Brick and cement. Survey References: null

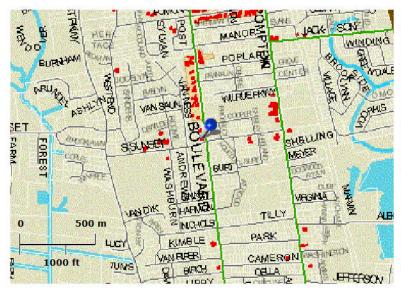
Other Documentation: null

Survey Date	Survey Person	Organization	
Jun 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: 243 BOULEVARD

Common Name: 243 Boulevard

Inventory Number: 1431-0017 Acroterion Number: 1431-017





Map Location

**Picture** 

### LOCATION AND SURROUNDINGS

Address: 243 BOULEVARD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: SILVA, JOHN & MICHELE Ownership Type: Private

Ownership Info: Richard & Cynthia Kirby Highlands: PLAN AREA

Siting and Related Structures:

This dwelling faces Boulevard, a major north-south road through Pequannock. There is a sidewalk in front of

the house, and a driveway at the side.

Surrounding Environment: Residential Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1820 To 1820 Source of Date: Field observation

Date Comments: 1820 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Irregularly-massed, rectangular wings

Builder: null Foundation: Brick

Style Type: Vernacular Elements Type: null

Primary Style: null Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.0

Influence: null Number of Bays: Multiple

Style Comments: Vernacular

Exterior Wall Fabric: Clapboard; vinyl siding on 1-story wing Roof / Chimney(s): Front gable central portion and 2 side gabled wings, all clad in asphalt shingles; 2 interior brick chimneys Fenestration: 2/2, 1/1, & 3/3 double-hung sash windows with old & new shutters; paired windows in gable end; louvered shutters on two wings Additional Architectural The house is an aggregation of small wings combined over a period of more than 150 years. The small rear wing Description: appears to be the earliest part, although much altered. The 3-bay side-hall wing probably dates from the first half of the 19th century. Both of these segments have wide fascia boards below the eaves. The front gable end window has a uniquely pedimented surround. The large wing (late 19th century) and the porch on turned posts contribute to the final appearance of the house. Another wing was attached to this last wing circa 1965. This was part of the Peter Roome holdings in 1876 when Boulevard was cut through the surrounding farmland. The surveyors map for that project depicts no house on this lot. According to neighborhood tradition, passed on to present owners (1986), at least part of the house was moved here. Its lack of architectural pretension puts it in the simplest farmhouse category. Several Roome family houses are located in this approximate location on an 1868 map of Pequannock; it is unclear which is the house surveyed here. The house grew over time with the addition of wings, the latest being circa 1965.

Significance:

This building is an example of vernacular construction. It has undergone many alterations, and no longer reflects its original construction. It is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not identified the owner or owners of this property, and has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

### **ASSOCIATED SURVEYS** Municipal ID: National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): **Historic American Building Survey** (HABS): State Register (SR): Historic American Engineering Record (HAER): **Delisted Info:** World Heritage Site (WHS):

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: ms. Map of Boulevard 3/22/1876

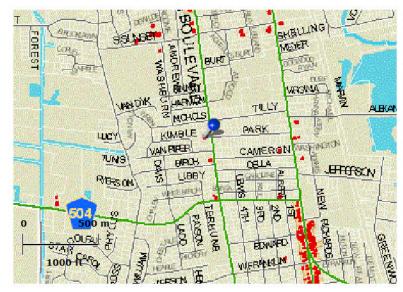
Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Mar 25 2007 12:00AM	E. Burling	KSK	

Feature Name: S. Slingerland House

Common Name: S. Slingerland House

Inventory Number: 1431-0012 Acroterion Number: 1431-012





Map Location

**Picture** 

### **LOCATION AND SURROUNDINGS**

Address: 177 BOULEVARD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: ROGERS, DOUGLAS & GRACE Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

This building is located along a major road in a residential neighborhood in Pequannock. It is set back from the

road.

Surrounding Environment: Suburban, Residential

Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1876 To 1887 Source of Date: Field observation; maps

Date Comments: 1876-1887 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular

Builder: null Foundation: Parged

Style Type: Vernacular Elements Type: null

Primary Style: null Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: null Number of Bays: 4

Style Comments: Vernacular

Exterior Wall Fabric:	Vinyl siding
Roof / Chimney(s):	Colored asphalt shingle clad side gable roof with gable mansard roof front portion; small conical tower with small shed dormers at center of roof; chimney not visible
Fenestration:	6/6 wood double-hung sash windows; double leaf wood and glazed paneled single-leaf door
Additional Architectural Description:	This synthetic-sided house has been altered with a series of additions, including a modern two-car garage at the rear of the property. There is a pedimented open porch at the front, its roof clad in asphalt shingles, supported by 2 wood columns.
History:	A house in this approximate location, labeled S. Slingerland, appears for the first time on the 1887 map of Morris County. According to the Acroterion survey, local tradition claims that the Slingerlands used the cupola as a look out to oversee their farmlands.
Significance:	This building is an example of vernacular construction; it is not a significant example of its method of construction, nor is it known to be the work of a master. Though intriguing, a series of additions have compromised the building's integrity (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

### **ASSOCIATED SURVEYS Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: Thematic Nomination (TRA): SHPO ID: **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): Historic American Building Survey (HABS): State Register (SR): **Historic American Engineering Record** (HAER): **Delisted Info:** World Heritage Site (WHS):

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null associated with prominent individuals Contribution to district: null outstanding example of its period or style provides information important to history Related Theme: null Feature Comments: null Survey References: Ms. Map of Boulevard surveyed by Benjamin Roome and Son, 3/22/1876 (Hall of Records Morristown) does not show this house; Robinson, 1887 Atlas of Morris County;

### Currently Viewing Survey Data 2 of 2

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: 165 BOULEVARD

Common Name: 165 Boulevard

Inventory Number: 1431-0011 Acroterion Number: 1431-011





**Picture** 

Map Location

### LOCATION AND SURROUNDINGS

Address: 165 BOULEVARD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: MAZUR, MICHAEL & KAREN L Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

Occupies large corner lot with appropriate landscaping and period garage modernized by new doors.

Surrounding Environment: Suburban Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1920 To 1920 Source of Date: Field observation

Date Comments: 1920 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular; center entry

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: null

Primary Style: Bungalow Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 1.5

Influence: null Number of Bays: 3

Style Comments: Bungalow

Exterior Wall Fabric:	Stucco; shingle in gable; wood shingles on rear addition
Roof / Chimney(s):	Side gable roof clad in asphalt shingles, with front gable dormer at center of front façade; exterior end stone chimney and interior concrete chimney; wood brackets and wide eaves
Fenestration:	3/3 wood double-hung sash windows at side elevation; 1/1 wood double-hung sash windows on front façade; paired 1/1 vinyl double-hung sash window in gable dormer
	Enclosed porch with 1/1 storm windows (by 1986). Secondary entrace on side façade, near the rear. Rear second-story addition is a post-1986 alteration.
Histor <b>y</b> :	This bungalow was built circa 1920. A rear second-story addition was built sometime between 1986 and 2006. This is a twin to the house at #291 Turnpike, which, as of 1986, had a somewhat better state of integrity.
Significance:	Its low, sweeping lines illustrate the bungalow ideal in its purest form and reflect early 20th century development trend that resulted in the subdivision of large pieces of the Townships farmland. This building is an example of vernacular bungalow construction; it is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). A large rear addition has altered the original form of the building. There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

ASSOCIATED SURVEYS			
Municipal ID:	National Register (NR):		
Morris County Historic Preservation Element 1976:	National Histor	ric Landmark (NHL)	
SHPO ID:	Thematic Nomination (TRA):		
SHPO Opinion:	Multiple Resource Area (MRA):		
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):		
Certification of Eligibility (COE):	Historic American Building Survey (HABS):		
State Register (SR):	Historic American Engineering Record (HAER):		
Delisted Info:	World Heritage Site (WHS):		

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: High Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: null

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: FHA House

Common Name: 30 Hopper Avenue

Inventory Number: 1431-0054 Acroterion Number: null





Map Location

**Picture** 

### LOCATION AND SURROUNDINGS

Address: 30 HOPPER AVE

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: ARENA, FRANK & JEANETTE M Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

This dwelling sits on a large lot, in a residential section of Pequannock Township. The houses on the street are roughly contemporaneous in age, and the street is nicely treed.

Surrounding Environment: Suburban Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1934 To 1934 Source of Date: Acroterion survey

Date Comments: 1934

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular; center hall; 2 bays deep

Elements Status: Remain

Builder: null Foundation: Unknown

Style Type: Revival Elements Type: Colonial

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.0

Influence: Colonial Number of Bays: 5

Style Comments: Colonial Revival

Primary Style: Colonial

Exterior Wall Fabric:	Aluminum siding
Roof / Chimney(s):	Side gable roof clad in asphalt shingles; aluminum covered cornice; 1 brick interior chimney
Fenestration:	1/1 vinyl double-hung sash windows with snap in dividers, symmetrical across primary façade; central primary entrance is single leaf
Additional Architectural Description:	null
History:	This dwelling was the first house in the nation to be insured by the Federal Housing Administration (FHA). The FHA was authorized by President Roosevelt in 1934, and since that time has "provide[d] mortgage insurance on loans made by FHA-approved lenders throughout the United States and its territories." It was started in 1934 in order to support the housing industry, help homebuyers get mortgages, and encourage homeownership. As a result of this program, the Housing Administration has "insured over 34 million home mortgages and 47,205 multifamily project mortgages since 1924." This house was the first to receive a mortgage insured by the FHA.
Significance:	This dwelling represents the beginning of a national trend toward homeownership, encouraged and supported by a Federal agency. It is eligible for the National Register per Criterion A, as it is associated with an historic trend that has made a significant contribution to the development of the nation. It is not associated with specific individuals; the original owners purchased the house with an FHA-sponsored loan, but did not themselves make a significant historical contribution (Criterion B). It is an example of Colonial Revival architecture popular in the 1930s, and has retained a good degree of integrity; however, it is not a significant example of its style or period of construction, and is not known to be the work of a master (Criterion C). It is unlikely that this property will be able to provide information important to history or prehistory (Criterion D). It is eligible for the National Register per Criterion A.
	ASSOCIATED SURVEYS
Municipal ID:	National Register (NR):
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):

# Municipal ID: Morris County Historic Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): SHPO Opinion: Multiple Resource Area (MRA): Determination of Eligibility (DOE): Certification of Eligibility (COE): Historic American Building Survey (HABS): State Register (SR): Historic American Engineering Record (HAER): Delisted Info: World Heritage Site (WHS):

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: Threats to Feature: null National Register Eligibility: null Criteria of Eligibility: A associated with specific events District feature is within: 1752 B associated with prominent individuals Contribution to district: null outstanding example of its period or style p provides information important to history Related Theme: Community Planning and Development Feature Comments: First in Time- This was the first house to receive a mortgage insured by the FHA (Federal Housing Administration.) Survey References: "The Federal Housing Administration," www.hud.gov/offices/hsg/fhahistory.cfm; "New Jersey Event Marks First FHA House." www.hud.gov/news/focus.cfm?content=2004-08-16.cfm

### Currently Viewing Survey Data 2 of 2

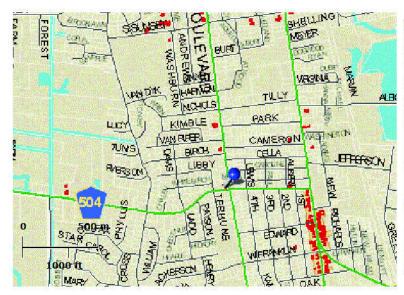
Other Documentation: null

Survey Date	Survey Person	Organization	
Dec 5 2006 12:00AM	E. Burling	KSK	
null	null	null	

Feature Name: Jacob Slingerland House

Common Name: Jacob Slingerland House

Inventory Number: 1431-0007 Acroterion Number: 1431-007





Map Location

**Picture** 

### **LOCATION AND SURROUNDINGS**

Address: 143 BOULEVARD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: BLOCK, BARRY J Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures: Sited close to a busy road at corner location, set behind modern picket fence, 2-car garage (ca. 1900) with

original double doors set back beside the house.

Surrounding Environment: Suburban, Residential

Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1780 To 1780 Source of Date: Field observation; plaque

Date Comments: 1780 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Side-hall, double pile and 4-bay wing.

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: Greek

Primary Style: Greek Elements Status: Remain

Secondary Style: Revival Details Status: Remain

Tertiary Style: null Number of Stories: 2.0

Influence: Greek Number of Bays: 7

Style Comments: Smaller wing is Saltbox profile.

Exterior Wall Fabric: Aluminum siding in wing, vinyl siding on main block

Roof / Chimney(s): Wood shingled side gable roof; one interior brick chimney in main block, 1 central brick chimney in addition

Fenestration: 6/6 wood double-hung sash window; paired 6-pane casements in wing dormers; Primary entrance has single leaf

wood paneled door, with 2 light transom and 3-light sidelights

Additional Architectural Description:

The main block is the simplest kind of vernacular Greek Revival house, identified as such only by the handsome, pilastered and recessed entry with side lights and transom. Three gable wall dormers are present. Smaller wing has saltbox profile and shed-roof porch supported by thin turned posts; decorative brackets have been added since the 1986 survey. Two side gabled dormers have been added to this wing.

History:

This house was originally situated on a portion of the Bog & Vly Meadow. The Acroterion survey states that this dwelling was built prior to Boulevard's completion, according to a marked beam in the house which reads "1762." The property was of a considerable size, and included agricultural lands and an industrial vinegar production area. The house is said to have been built by Nicholas Slingerland but was enlarged to its present size by his son Jacob, a skilled carpenter/builder. The date of Jacob's wing is undocumented, but if the Greek Revival entry is original, per Morris County architectural history the addition would date to around

Following Jacob's death, the house passed to his daughter, Ann Elizabeth, who lived there with her sisters Marietta and Emily. Because it housed these three unmarried sisters, the house came to be known as "Old Maid's Corner." Upon Ann Elizabeth's death, the house was to be given to the State of New Jersey to become a Protestant Industrial Home for Girls. However, because Ann Elizabeth's will stipulated a religious purpose for the building, the state could not accept it, and it was instead turned over to a niece, Lillian DeBow.

The Slingerland family was known for the production of industrial vinegar for the treating of steel, and for their apple crops.

Significance: This house is not a significant example of its style or period of construction, and is not known to be the work of a prominent architect (Criterion C). It is not likely that this building will be able to provide information about history or prehistory (Criterion D). It is not associated with significant events in the history of Pequannock or the area (Criterion A). The dwelling is associated with the Slingerland family, but no evidence has indicated that they were significant persons in the history of Pequannock or the region (Criterion B). This property is not eligible for the National Register.

Survey References:

Lightfoot and Gill, 1853 Map of Morris County;

Ghosts of the Past: Historic Homes, Pequannock Township, Planning Department, 1974;

Early Settlements & Settlers of Pompton Pequannock and Pompton Plains. Handwritten ms. Of Rev. Garret C. Schenck, NJ Historical Society.

ASSOCIATED SURVEYS			
Municipal ID:	National Register (NR):		
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)		
SHPO ID:	Thematic Nomination (TRA):		
SHPO Opinion:	Multiple Resource Area (MRA):		
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):		
Certification of Eligibility (COE):	Historic American Building Survey (HABS):		
State Register (SR):	Historic American Engineering Record (HAER):		
Delisted Info:	World Heritage Site (WHS):		

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### **INSPECTION DATA**

Demolished	Demo Date:	null		
Integrity:	Medium			
Threats to Feature:	No Threat			
lational Register Eligibility:	Not Eligible			
Criteria of Eligibility:				
A associated	d with specific e	events	District feature is within:	null
B associated	d with prominen	nt individuals	Contribution to district:	null
outstandin	ng example of it	ts period or style		
provides in	nformation impo	ortant to history		
Related Theme:	null			

Feature Comments: null

Survey References: Lightfoot and Gill, 1853 Map of Morris County;

Ghosts of the Past: Historic Homes, Pequannock Township, Planning Department, 1974;

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	кѕк	

Feature Name: 741 TURNPIKE

Common Name: 741 Turnpike

Inventory Number: 1431-0055 Acroterion Number: null





Map Location Picture

### LOCATION AND SURROUNDINGS

Address: 741 TURNPIKE

Owner at time of survey: GRONDA, RICHARD M & MELISSA

**Municipality:** Pequannock **Zip Code:** 07440

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

This building is located in a residential section of Pequannock. It sits on a small lot, close to the road, among

Ownership Type: Private

other bungalows all built at around the same time.

Surrounding Environment: Residential, Suburban Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1900 To 1900 Source of Date: Pequannock Twp.

Date Comments: 1900 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: null

Builder: null Foundation: Unknown

Style Type: null Elements Type: Craftsman

Primary Style: Shingle Elements Status: Remain

Secondary Style: Craftsman Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Craftsman Number of Bays: 2

Style Comments: Craftsman/Shingle

Exterior Wall Fabric:	Wood shake
Roof / Chimney(s):	Steeply pitched side gable roof clad in asphalt shingles; wood cornice with exposed rafters; 1 brick interior chimney
Fenestration:	6/1 and multi-pane diamond/1 wood double-hung sash windows; irregular placement; wood multi-light single leaf door
Additional Architectural Description:	null
History:	According to Pequannock Township, this is the Harry Berry House, ca. 1900. It is a farmhouse used as a rental property by Berry family
Significance:	This house is not a significant example of its style or period of construction, and is not known to be the work of a prominent architect (Criterion C). It is not likely that this building will be able to provide information about history or prehistory (Criterion D). It is not associated with significant events in the history of Pequannock or the area (Criterion A). The dwelling is associated with the Berry family, but no evidence has indicated which member of the family was associated with this house, and if they were a significant person in the history of Pequannock or the region. Further, research has suggested that this was used as a rental property, so it is possible that the Berry family did not occupy this particular dwelling (Criterion B). This property is not eligible for the National Register.

ASSOCIATED SURVEYS			
Municipal ID:	National Register (NR):		
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)		
SHPO ID:	Thematic Nomination (TRA):		
SHPO Opinion:	Multiple Resource Area (MRA):		
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):		
Certification of Eligibility (COE):	Historic American Building Survey (HABS):		
State Register (SR):	Historic American Engineering Record (HAER):		
Delisted Info:	World Heritage Site (WHS):		

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: Threats to Feature: null National Register Eligibility: null Criteria of Eligibility: A associated with specific events District feature is within: 1763 B associated with prominent individuals Contribution to district: null outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: http://www.pequannocktownship.org/documents/historic/harryberry.htm

### Currently Viewing Survey Data 2 of 2

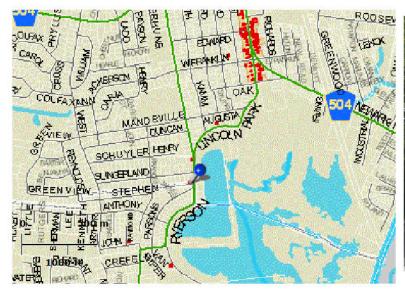
Other Documentation: null

Survey Date	Survey Person	Organization	
Dec 5 2006 12:00AM	E. Burling	KSK	
null	null	null	

Feature Name: Nicholas Slingerland House

Common Name: Nicholas Slingerland House

Inventory Number: 1431-0001 Acroterion Number: 1431-001





Map Location Picture

### LOCATION AND SURROUNDINGS

Address: 21 LINCOLN PARK RD

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: BOYD, DIANA Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

This building sits immediately adjacent to a two-lane road.

Surrounding Environment: Residential Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1830 To 1830 Source of Date: Field observation and map sequence

Date Comments: 1830 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Center hall, block & wing

Builder: null Foundation: Not Visible

Style Type: Vernacular Elements Type: null

Primary Style: null Elements Status: Unknown
Secondary Style: null Details Status: Removed

Tertiary Style: null Number of Stories: 2.5

Influence: null Number of Bays: 5

Style Comments: Vernacular

Exterior Wall Fabric:	Synthetic siding
Roof / Chimney(s):	Asphalt shingle clad side gable roof with projecting eaves; 2 brick end chimneys
Fenestration:	1/1 vinyl double-hung sash windows with snap-in dividers; 6/1 double-hung sash windows in enclosed porch; single leaf wood door with transom above
Additional Architectural Description:	Flat roofed porch with turned posts (a recent replacement, circa 2005). The 2-story wing has a side gable roof and enclosed porch with a hipped roof. House has aluminum boxed gutters. Rear additions appear to be modern.
Histor <b>y</b> :	A block-and-wing house typical of 19th-century New Jersey practice, this was occupied by N.J. Slingerland, a member of a family prominent in Pequannock. By 1986, the basic form was intact, but the integrity was compromised by siding and other alterations. It is unclear which part of the house is original.
	According to Munsell, Nicholas Slingerland was one of the earliest settlers in the area.
Significance:	This building is an example of vernacular construction; it is not a significant example of its method of construction, nor is it known to be the work of a master. Additionally, alterations including the replacement of windows, addition of porches, and synthetic siding have reduced the overall integrity of the dwelling (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant

of on individuals. Though an early settler, no information has proven a significant contribution to history by Nicholas Slingerland (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

World Heritage Site (WHS):

### **ASSOCIATED SURVEYS Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): Historic American Building Survey (HABS): State Register (SR): **Historic American Engineering Record** (HAER):

**Delisted Info:** 

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: Low Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: Lightfoot and Gill, 1853 Map of Morris County;

Other Documentation: null

Munsell, p. 267.

Survey Date	Survey Person	Organization	
Mar 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: J. Sindle House

Common Name: J. Sindle House

Inventory Number: 1431-0002 Acroterion Number: 1431-002





**Picture** 

Map Location

### **LOCATION AND SURROUNDINGS**

Address: 37 LINCOLN PARK RD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: DENZLER, DONALD & MARISA SAVINO Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

Located within a few feet of the road, in a residential section of Pequannock.

Surrounding Environment: Residential Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1855 To 1865 Source of Date: Field observation and map sequence

Date Comments: 1855-1865

Additional Alteration Year: null

Architect: null Form/Plan Type: Gable front and ell; side hall and 3-bay

wing

Builder: null Foundation: Stone

Style Type:VernacularElements Type:ItalinatePrimary Style:nullElements Status:Remain

Secondary Style: Italinate Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Italinate Number of Bays: 6

Style Comments: Vernacular

Page 1 of 3

Fvte	rior	Wall	Fabric:	Vinyl	sidina
EXL	CIOL	wan	rabric:	VIIIVI	Siaina

Roof / Chimney(s): Main block has front gable roof; side wing has side gable roof, both clad in asphalt shingles; one concrete

exterior chimney on wing

Fenestration: 1/1 vinyl double-hung sash windows with snap-in dividers; arched window in gable end; faux louvered shutters

Additional Architectural Description:

Main block with gable front to road shows typical Italianate round arched attic window simple molded eaves, entry porch enclosed with 8/8 windows and 12-light transom; this has been enclosed since the 1986 survey. According to Acroterion, the small side wing may originally have been 1 1/2 stories. This wing also had an exposed fireback prior to the 1986 survey.

The Acroterion survey suggests that the roof of the small wing may have been raised, perhaps when the larger portion of the house was built, or perhaps even later. Map evidence is ambiguous in regard to the history of this property. It is thought to be the J. Sindle house that appears on an 1868 Beers map of Morris County in this location; in 1853, the house in this approximate location is labeled "D. Ackerson."

Late 20th-century changes to the building include application of vinyl siding, porch enclosure on the main block, porch roof alteration on the wing, and addition of faux shutters.

Significance:

This building is an example of vernacular construction; it is not a significant example of its method of construction, nor is it known to be the work of a master. Alterations to the façade and windows have reduced the building's overall integrity, and its development pattern is unclear (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals; no information has been found to show that the Sindle family was prominent in Pequannock (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

ASSOCIATED SURVEYS		
Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Histor	ric Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

# **INSPECTION DATA** Demolished Demo Date: Integrity: Low Threats to Feature: No Threat National Register Eligibility: null Criteria of Eligibility: District feature is within: null A associated with specific events B associated with prominent individuals Contribution to district: null outstanding example of its period or style provides information important to history Related Theme: null Feature Comments: null Survey References: Lightfoot and Gill, 1853 Map of Morris County; Beers, F.W. 1868 Map of Morris County

Other Documentation: null

Survey Date	Survey Person	Organization
Mar 1 1986 12:00AM	R. Guter	Acroterion
Apr 1 2007 12:00AM	E. Burling	KSK

Feature Name: Van Gelder-Van Saun House

Common Name: Van Gelder-Van Saun House

Inventory Number: 1431-0044 Acroterion Number: 1431-048





Map Location

**Picture** 

### LOCATION AND SURROUNDINGS

Address: 770 TURNPIKE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: WOJTYSZYN, P R & PERILLO, D Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures: In 1986, a gambrel-roofed 1 and 1/2 story shingled building was located behind the house; it may have been a

small stable, heavily altered for residential use (not visible during 2006 survey). The property is now

immediately adjacent to Carriage Court and two new dwellings (c. 2000).

Surrounding Environment: Residential

Subdivided

### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1750 To 1750 Source of Date: Field observations

Date Comments: 1750 +/-; 1860 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Center hall single-pile and 4-bay rear wing

Builder:nullFoundation:StoneStyle Type:VernacularElements Type:MultiplePrimary Style:GothicElements Status:Remain

Secondary Style: Dutch Colonial Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Multiple Number of Bays: 5

Style Comments: Vernacular Gothic Revival/Dutch Colonial

Exterior Wall Fabric: Vinyl siding; cobblestone

Roof / Chimney(s): Cross gable roof on 2-story block; original 2 story portion has mansard roof; 3 interior brick chimneys

Fenestration: 2/2 wood double-hung sash windows; Gothic Revival window in center gable; double leaf wood/glazed doors

with 2-light transom; 12/12 wood double-hung sash in rear section

Description:

Additional Architectural Original house is 4-bay fieldstone 2-story rear block of Dutch origin with a mansard roof and gable dormers. In the late 19th century, this wing received a flat roofed porch carried on posts. Some 12/12 wood sash survive from the earliest period of this wing. Attached at the front is a single pile, frame farmhouse with cross gable roof and Gothic attic window. Façade composition replicates that of the Peter Hopper house.

> According to the Acroterion survey, this was once part of the extensive holdings of Paulus Vanderbeck, Martin History: Berry's step-father, whose acreage stretched to the Pompton River. Vanderbeck's oldest daughter, Catalyna, married Johannis Van Gelder. The property was then left to their son John following Catalyna's death in 1784. By 1800, the property had passed to a Rachel Van Gelder, who married John Van Saun. Although the property lineage is traceable, there is no definitive construction date for the house. Salvini suggests a pre-

1776 construction date for the original stone portion.

According to Parr, the smaller portion of the original property on which this house now stands was given to Catalyina and Johannis as a wedding gift in 1812. The main portion of the current house is likely a 19th-century addition to the original south-facing rear wing. A south-facing house was a "custom common to Dutch home builders." Pequannock Township Planning Department book, "Ghosts of the Past: Historic Homes," states that there was rumored to have been a slave quarter on the grounds, and that the house has overall been radically altered since its construction, with the earliest section being in the rear of the current building.

The front of the house, with its Victorian-style wood addition, is thought to have been constructed by Ewout Van Saun around "the middle of the Nineteenth century," and includes "a center hall and staircase, a room on either side with marble fireplaces and upstairs, the hall and bedrooms. ... The old house lost its complete west stone wall to accommodate this addition."

Significance:

The Van Gelder-Van Saun House is an example of an 18th-century farm dwelling that was adapted over time, incorporating earlier structures, to serve its owner's needs. This appears to be a significant architectural trend in Morris County. These buildings were often of common form, ultimately dressed in minimal Romantic Revival ornament - in this case, Second Empire and Gothic Revival. There is no definite construction date known for this house, but based on the family history, the earlier rear, stone, portion is thought to have been built pre-1776. A late 19th-century frame farmhouse addition presents a very different face to the Turnpike, and is extremely similar to the latest portion of the Peter Hopper House on Post Road. It is a significant example of this style (Criterion C). Although the later portion of the building has been clad in vinyl siding, it likely mimics an original clapboard exterior.

The building is associated with the Van Gelder and Van Saun families, but there is no evidence that these land owners were significant in the history of Pequannock (Criterion B). There is also no evidence that the building is significant for its association with important events in the history of the area (Criterion A), nor that it will be able to provide information important in history or prehistory (Criterion D).

Survey References:

Lightfoot and Gill, 1853 Map of Morris County.;

George G. Parr, A History of Pequannock Township, Morris County, New Jersey: Our Two Hundred and Fiftieth Anniversary.

"Early Settlements and Settlers of Pompton, Pequannock and Pompton Plains" manuscript, By Rev Garret C Schenk (available at NJ Historical Society).

### ASSOCIATED SURVEYS

Municipal ID;	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)	
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

### **INSPECTION DATA**

Demolished Demo Date: null

Integrity: Medium

Threats to Feature: No Threat

National Register Eligibility: Eligible

Criteria of Eligibility:

A associated with specific events

outstanding example of its period or style

B associated with prominent individuals

provides information important to history

Related Theme: Architecture

Feature Comments: null

Survey References: Lightfoot and Gill, 1853 Map of Morris County.;

George G. Parr, A History of Pequannock Township, Morris County, New Jersey: Our Two Hundred and

District feature is within: null

Contribution to district: null

Fiftieth Anniversary.

Other Documentation: null

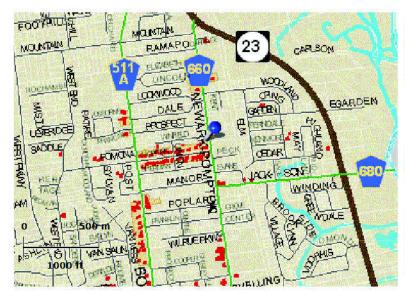
Survey Date	Survey Person	Organization	
Jun 1 1986 12:00AM	R. Guter	Acroterion	
Apr 4 2007 12:00AM	E. Burling	KSK	



Feature Name: Thomas Mandeville House

Common Name: Thomas Mandeville House

Inventory Number: 1431-0039 Acroterion Number: 1431-042





Map Location

**Picture** 

#### **LOCATION AND SURROUNDINGS**

Address: 679 TURNPIKE

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: OSTERGAARD, PAUL A & KAREN A Ownership Type: Private

Ownership Info: Paul Ostergaard Highlands: PLAN AREA

Siting and Related Structures:

null

Surrounding Environment: Residential

. .

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Commercial Office

Construction Date Range: 1825 To 1825 Source of Date: Plaque on house

Date Comments: 1825

Additional Alteration Year: null

Architect: null Form/Plan Type: Side hall, double pile, plus 3-bay wing

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: Federal

Primary Style: Federal Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 1.5

Influence: Federal Number of Bays: 3

Style Comments: Vernacular Federal

Exterior Wall Fabric: Clapboard

Roof / Chimney(s): Side gable roof clad in asphalt shingles; Interior brick end-chimneys on main block and wing

Fenestration: 1/1 wood double-hung sash windows in shed roof dormers; 6/6 wood double-hung sash in main block, 1st floor;

2/2 wood double-hung sash in wing; single leaf entrance; operable louvered shutters on 1st floor; faux louvered

shutters above.

Additional Architectural

Description:

Main block has federal doorway with single light side-lights and molded architrave with corner blocks. Entrance in wing is single leaf door with metal screen door. House was altered 1st quarter of 20th century, by extending

roof to make porch carried by 3 Doric columns. Shed dormers probably added concurrently.

History: The Mandeville family emigrated from France via England and Holland in the 17th century. Thomas

Mandeville was the son of Giles A. Mandeville, and married Hestor Bailey Secor in 1830. Thomas is said to have built this house shortly after his marriage, a date that seems reasonable in view of the architectural appearance. The house was later owned by Charles Mandeville and then his daughter Jennie, both of whom served as Township tax collectors. Residents of the township would come to this house to pay their taxes

from 1915 through 1953.

According to Parr, the Interior of the house "had several distinctive features," including a hallway that ran the east-west width of the house, two sets of stairs, and bricks used as insulation between rooms. The

house, and used it as a medical office and a residence.

Significance: This dwelling is an example vernacular Federal construction that has been subsequently altered; its overall

integrity has been compromised. It is not a significant example of its style or period of construction, and is not known to be the work of a master (Criterion C). It has been associated Thomas Mandeville, but there is not evidence that he was a significant individual in the history of Pequannock (Criterion B). The dwelling is not known to be associated with significant events, and is unlikely to be able to provide information important to

history or prehistory (Criterion D). It is not eligible for the National Register.

Survey References: Parr, George G. A History of Pequannock Township, Morris County, New Jersey: Our Two Hundred and Fiftieth

Anniversary, p. 243.

Ghosts of the Past: Historic Homes of Pequannock Township. Pequannock Twp. Planning Department, 1974, p.

26-27

Emil Salvini, Historic Pequannock, 1987, p. 81.

#### ASSOCIATED SURVEYS

Municipal ID:	National Register (NR):		
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)		
SHPO ID:	Thematic Nomination (TRA):		
SHPO Opinion:	Multiple Resource Area (MRA):		
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):		
ertification of Eligibility (COE):	Historic American Building Survey (HABS):		
State Register (SR):	Historic American Engineering Record (HAER):		
Delisted Info	World Heritage Site (WHS):		

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#### **INSPECTION DATA**

Demolished	Demo Date:	null		
Integrity:	Medium			
Threats to Feature:	No Threat			
lational Register Eligibility:	Not Eligible			
Criteria of Eligibility:				
A associated	d with specific e	events	District feature is within:	null
B associated	d with prominen	t individuals	Contribution to district:	null
outstandii	ng example of it	s period or style		
D provides in	nformation impo	ortant to history		
Related Theme:	null			
Feature Comments:	null			

Survey References: Parr, George G. A History of Pequannock Township, Morris County, New Jersey: Our Two Hundred and

Fiftieth Anniversary, p. 243.

Ghosts of the Past: Historic Homes of Pequannock Township. Pequannock Twp. Planning Department,

Other Documentation: null

### Currently Viewing Survey Data 2 of 2

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Page 3 of 3

Feature Name: Paul Revere Hall

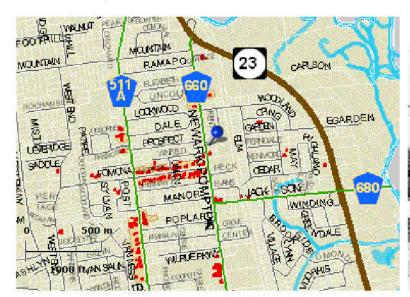
# **Historic Site Report**

**Common Name:** 

John H. Lookhoff American Legion

Building

Inventory Number: 1431-0037 Acroterion Number: 1431-040





Map Location

**Picture** 

#### LOCATION AND SURROUNDINGS

Address: 700 TURNPIKE

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: AMERICAN LEGION INCORP Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

Surrounded by parking lot, adjacent to gas station.

Surrounding Environment: Downtown Commercial

S

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Entertainment Social/Meeting Hall Present Use: Meeting Hall

Construction Date Range: 1896 To 1896 Source of Date: Carl Edwards

Date Comments: 1896

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular; 3-bay end facing street,

center entry

Builder: null Foundation: Cement

Style Type: Revival Elements Type: Colonial

Primary Style: Colonial Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Colonial Number of Bays: 3

Style Comments: Vernacular Colonial Revival

Exterior Wall Fabric: Vinyl siding

Roof / Chimney(s): Gabled hip roof with center gable clad in asphalt shingles; 2 interior brick chimneys (not visible from street

during 2006 survey)

Fenestration: 1/1 vinyl double-hung sash replacement windows with snap-in dividers; Palladian window on second story

Additional Architectural Projecting gable entry altered with new double leaf door with 12-light transom; shed roof secondary entrance at **Description:** side; 2-story, 1-bay square addition at side.

History: According to Carl Edwards, Paul Revere Hall was built in 1896 by a prosperous and benevolent organization called "The Junior Order of American Mechanics." Parr states that the building was "from 1896 to 1928 ... the only auditorium and dance floor in town." The building basically functioned as a town center for 30 years at the turn of the 20th century, hosting everything from government functions, school and church sessions, and plays and dances. A small cell in the basement was even the township's first jail. Following World War II, the American Legion purchased the building.

This building is associated with benevolent societies in the history of Pequannock Township, but is not known to be associated with specific individuals or events in the history of the township or the region (Criteria A and B). It is not likely to be able to provide information important in history or prehistory (Criterion D). Alterations to the entry, windows, and siding have compromised its integrity; it is not a significant example of its style, period of construction, or type (Criterion D). Although it served a prominent role in the community's early days, It is not eligible for the National Register.

#### ASSOCIATED SUBVEVS

ASSOCIATED SURVEYS			
National Register (NR):	Municipal ID:		
National Historic Landmark (NHL)	Morris County Historic Preservation Element 1976:		
Thematic Nomination (TRA):	SHPO ID:		
Multiple Resource Area (MRA):	SHPO Opinion:		
Multiple Property Submission (MPS):	Determination of Eligibility (DOE):		
Historic American Building Survey (HABS):	Certification of Eligibility (COE):		
Historic American Engineering Record (HAER):	State Register (SR):		
World Heritage Site (WHS):	Delisted Info:		

# **INSPECTION DATA** Demolished Demo Date: Integrity: Low Threats to Feature: Alterations National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: Carl Irving Edwards. Pequannock Township 1740-1956, p.50; George G. Parr, A History of Pequannock Township, Morris County, New Jersey: Our Two Hundred and Fiftieth

Other Documentation: null

Anniversary, p. 215.

Survey Date	Survey Person	Organization	
Jun 1 1986 12:00AM	R. Guter	Acroterion	
Apr 4 2007 12:00AM	E. Burling	KSK	

Feature Name: 678 TURNPIKE

**Common Name:** 678 Turnpike

Inventory Number: 1431-0038 Acroterion Number: 1431-041





Map Location

**Picture** 

#### LOCATION AND SURROUNDINGS

Address: 678 TURNPIKE

Municipality: Pequannock **Zip Code:** 07440

Owner at time of survey: ROSARIO, GEORGE E & GALLO, SUSAN Ownership Type: Private

Ownership Info: Highlands: PLAN AREA null

Siting and Related Structures:

null

Surrounding Environment: Residential

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

**Construction Date Range:** 1850 To 1850 Source of Date: Field observations

Date Comments: 1850 +/-

Additional Alteration Year: null

Center entry, double pile with single pile Form/Plan Type: Architect: null

wing

Builder: null Foundation: Cement Style Type: Vernacular **Elements Type:** Gothic

Primary Style: Gothic Elements Status: Remain Secondary Style: Revival Details Status: Removed

Number of Stories: 2.5 Tertiary Style: null

Influence: null Number of Bays: 4

Style Comments: null

Page 1 of 3

Exterior W	all Fabric:	Vinyl	siding
------------	-------------	-------	--------

Roof / Chimney(s): Cross gable roof clad in asphalt shingles; projecting eaves; 1 gable end chimney

Fenestration: 1/1 vinyl double-hung sash windows with snap in dividers; 3-part bay window in wing; original wood door

surround with infilled transom and metal door

Additional Architectural Description:

Smaller wing may be much altered earlier house to which a ca. 1860's block was added. Center second-story windows and small gothic gable window have been removed since 1986. Furthermore, a full second story has

been added to the wing, and the porch replaced, adding a center gable to the porch roof.

History: Map evidence is ambiguous here but there appears to have been a house occupying this site by 1853; no owner

is identified.

Significance: This building is an example of vernacular construction; it is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

ASSOCIATED SURVEYS			
Municipal ID:	National Register (NR):		
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)		
SHPO ID:	Thematic Nomination (TRA):		
SHPO Opinion:	Multiple Resource Area (MRA):		
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):		
Certification of Eligibility (COE):	Historic American Building Survey (HABS):		
State Register (SR):	Historic American Engineering Record (HAER):		
Delisted Info:	World Heritage Site (WHS):		

# **INSPECTION DATA** Demolished Demo Date: Integrity: Low Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: District feature is within: null A associated with specific events B associated with prominent individuals Contribution to district: null outstanding example of its period or style provides information important to history Related Theme: null Feature Comments: null Survey References: Lightfoot and Gill, 1853 Map of Morris County.

#### **Currently Viewing Survey Data 2 of 2**

Other Documentation: null

Survey Date	Survey Person	Organization
Jul 1 1986 12:00AM	R. Guter	Acroterion
Apr 1 2007 12:00AM	E. Burling	KSK

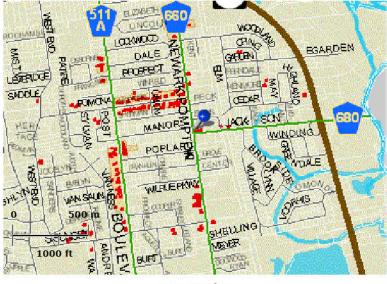
Feature Name: Pompton Plains School No. 2

**Common Name:** Pompton Plains School No. 2

Inventory Number: 1431-0034

Acroterion Number: 1431-035





Map Location

**Picture** 

#### LOCATION AND SURROUNDINGS

**602 TURNPIKE** Address:

Municipality: Pequannock **Zip Code:** 07440

Owner at time of survey: JONES, ROBERT V Ownership Type: Private

Ownership Info: Highlands: PLAN AREA null

Siting and Related Structures: This building sits in the commercial downtown area of Pequannock, close to the road. It is immediately

adjacent to the Jones Hardware store. There is a sidewalk in front of the building.

Surrounding Environment: Downtown Commercial

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Educational Schoolhouse Original Use: Present Use: Commercial Retail/Services

**Construction Date Range:** 1850 To 1850 Source of Date: Carl Edwards

Date Comments: 1850 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Central entry; rectangular

Builder: null Foundation: Not Visible

Style Type: Vernacular Elements Type: null

Primary Style: null Elements Status: Removed Secondary Style: null Details Status: Removed

Tertiary Style: null Number of Stories: 2.5

Influence: null Number of Bays: 3

Style Comments: Vernacular

Exterior Wall Fabric:	Asbestos shingles
Roof / Chimney(s):	Front gable roof clad in asphalt shingles; wood cornice
Fenestration:	1/1 vinyl double-hung sash windows with snap-in dividers; 2 doors on front façade
Additional Architectural Description:	Fixed single-light storefront window; 2 entrances - one for store, a 6-panel wood single leaf door, and one metal door for access to upstairs; hipped pent over first floor with asphalt shingles; round arched window opening in gable; wooden stairs along side elevation to second-story rear entry.
History:	According to Carl Edwards and George Parr, this schoolhouse once stood opposite the Dutch Reformed Church and was moved here by Alexander Gilland in 1872 when a new school was built. The original construction date is thought to be 1819. The school is depicted opposite the church on the 1853 map.
	The building has been used as a school, a butcher shop, and an optician's office. The second floor once served as an apartment, following its conversion from classroom space.
Significance:	This building is a rare example of early vernacular construction. It has been successively altered, however, and no longer reflects its construction as a school house in the early 1820s. It was also moved from its original location to this lot (Criterion C). It is not known to be associated with significant events or people in the history of Pequannock, the state, or the nation (Criteria A and B). It is unlikely to be able to provide information important in history or prehistory (Criterion D). It is not eligible for the National Register.

#### **ASSOCIATED SURVEYS Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: Thematic Nomination (TRA): SHPO ID: **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): Historic American Building Survey (HABS): State Register (SR): **Historic American Engineering Record**

**Delisted Info:** 

(HAER):

World Heritage Site (WHS):

ruge z or s

# Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null C outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null

Survey References: Edwards, Carl Irving, Pequannock Township 1740-1956, pp. 28-29;

Parr, George G. A History of Pequannock Township, Morris County, New Jersey: Our Two Hundred and Fiftieth

Anniversary, p. 215.

Other Documentation: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: Berry's Corner

Common Name: Jones' Store

Inventory Number: 1431-0033 Acroterion Number: 1431-034





Map Location Picture

#### LOCATION AND SURROUNDINGS

Address: 600 TURNPIKE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: JONES, ROBERT S Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

Located at the corner of Turnpike and Jackson Ave, in the main historic commercial core of Pequannock.

Property includes a barn.

Surrounding Environment: Downtown Commercial Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Commercial Retail/Services Present Use: Commercial Retail/Services

Construction Date Range: 1850 To 1850 Source of Date: Field observation; map evidence

Date Comments: 1850 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangle with long side facing Turnpike

Builder: null Foundation: Not Visible

Style Type: Vernacular Elements Type: Stick

Primary Style:nullElements Status:RemainSecondary Style:nullDetails Status:Remain

Section States States

Tertiary Style: null Number of Stories: 2.0

Influence: Stick Number of Bays: 6

Style Comments: Vernacular

Page 1 of 3

Exterior	Wall Fabric:	Ashestos	shinales
LACCITOI	vvali i abiic.	HODEOLUO	SHILLIGES

Roof / Chimney(s): Side gable roof with projecting eaves; brick interior end chimney on 1-story wing

2/2, 1/1, and 3/3 wood double-hung sashwindows; 12-pane fixed window on wing; faux louvered shutters; Fenestration:

irregular fenestration pattern

Additional Architectural Description: The simple vernacular building has been subjected to successive alterations and changes in fenestration. The store entrance is now cut diagonally on a corner and shielded by a shed roof that wraps around the corner

supported on stick-style wood knee braces.

History:

This property has been known as Berry's, Gilland's, and Jones' corner. One of the earliest owners was David M. Berry, who is noted on an 1853 map as the owner. Berry operated a grocery store here, which was later purchased by Alexander Gilland in 1864. Gilland worked for Berry for a short time prior to purchasing the store from him. The 1868 map notes that it also served as a Post Office at that time. The building has also served as a home, an inn, and a general store. According to Parr, "in the barns and storage sheds behind the store and windmill, fencing, feed, and other farm supplies were kept." It became Jones' store around 1929 when Bob

Jones purchased the building and opened a hardware store.

Significance:

This property is an example of commercial construction in the historic downtown core of Pequannock, and is a rare surviving example of that typology. The building has been associated with the Berry and Gilland families; both were merchants in the area. In addition to this store, Alexander Gilland operated a hotel across the street (now demolished). Successive alterations to the store front have caused the building to not clearly reflect the period of time in which either the Berrys or the Gillands owned a business here. It is not eligible per Criterion C, for its architecture, nor for Criterion B, for its association with these families. It is not likely to be able to provide information important to history or prehistory (Criterion D), and is not known to be associated with significant events in the history of the are (Criterion A).

ASSOCIATED SURVEYS			
Municipal ID:	National Register (NR):		
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)		
SHPO ID:	Thematic Nomination (TRA):		
SHPO Opinion:	Multiple Resource Area (MRA):		
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):		
Certification of Eligibility (COE):	Historic American Building Survey (HABS):		
State Register (SR):	Historic American Engineering Record (HAER):		
Delisted Info:	World Heritage Site (WHS):		

	INSPECT	TION DATA	
Demolished	Demo Date: null		
Integrity:	Medium		
Threats to Feature:	No Threat		
National Register Eligibility:	Not Eligible		
Criteria of Eligibility:			
A associated	with specific events	District feature is within:	null
B associated	with prominent individuals	Contribution to district:	null
outstanding	g example of its period or style		
p provides in	formation important to history		
Related Theme:	null		
Feature Comments:	null		

**Survey References:** 

Lightfoot and Gill, 1853 Map of Morris County;

Ghosts of the Past: Historic Homes, Pequannock Twp, 1974, p. 16

Other Documentation: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Mar 27 2007 12:00AM	E. Burling	KSK	

**Feature Name:** 

#### **Reformed Netherlands Dutch** Church

**Common Name:** Reformed Netherlands Dutch Church

Inventory Number: 1431-0027





MARKE VENER. 0 PARK

Map Location

#### LOCATION AND SURROUNDINGS

Address: 513-535 TURNPIKE

Municipality: Pequannock **Zip Code:** 07440

Owner at time of survey: FIRST DUTCH REFORMED CHURCH Ownership Type: Private

Highlands: PLAN AREA Ownership Info: null

Siting and Related Structures: There is an 18th and 19th-century cemetery adjacent to the church, with a modern church office on the other

side. The parcel also includes the Giles Mandeville house (now the parsonage, 1431-0026), and the Grace

Chapel (1431-0028), bothe surveyed individually.

Surrounding Environment: Downtown Commercial

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Religious Church Present Use: Religious Church

Construction Date Range: 1771 Source of Date: Church records To 1771

Date Comments: 1771, 1814, 1938 (Hobart Upjohn)

Additional Alteration Year: null

Gable front to road. Side elevations 5-bays Architect: Hobart Upjohn Form/Plan Type:

long.

Builder: null Foundation: Brick

Style Type: null **Elements Type:** Other Primary Style: Wren-Gibbs Formula Elements Status: Remain

Secondary Style: null Details Status: Remain

Number of Stories: 2.0 Tertiary Style: null

Number of Bays: 3 Influence: null

Style Comments: null

Roof / Chimney(s): Front gable roof, 1 interior chimney

Fenestration: Multi-paned, round-arched windows with brick quoins

#### Additional Architectural Description:

Projecting 3 stage tower, detailed with balustrade louvered apertures, octagonal steeple. 3 façade entries have round-arched fanlights, and center double leaf entry is surmounted by one round-arched window and a circular window.

History: Built by the congregation of the Reformed Netherlands Dutch Church, organized in 1736, this is probably 1 of the 2 architecturally significant 18th century houses of worship in Morris County, the other being the Friends Meeting House in Randolph (Acroterion). Although it was partially rebuilt after the fire of 1937, the fact that the architect Hobart Upjohn (grandson of Richard) designed the renovations makes the alterations significant themselves. Until about 1930, this was Pequannock's only church, a reflection of the continuing hegemony of the first Dutch settlers. It continues to be the township's most visually prominent landmark contributing a focal point to an otherwise haphazardly developed Main Street.

According to a NJ HPO Opinion, dated November 25, 2002, the First Reformed Church "is not eligible for listing in the National Register of Historic Places due to the fact that it was almost completely destroyed and rebuilt after a devastating fire in 1937." They also determined in the same letter that the associated Grace Chapel was individually eligible, per Criterion C, meeting Criteria Consideration A regarding religious properties.

	ASSOCIATED SURVEYS	
Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic L	andmark (NHL)
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

# **INSPECTION DATA** Demolished Demo Date: Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null associated with prominent individuals Contribution to district: null outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: The adjacent cemetery was not surveyed in 1986 or 2007. In the Morris County Burial Sites survey, it is referred to as Pompton Plains Reformed Churchyard, described as "huge", established pre-1775. Contains graves of early Dutch residents.

**Survey References:** 

SHPO Opinion, November 25, 2002;

GeoTrans, "Evaluation of the AT&T Wireless First Reformed Church Site...," October, 2002.

Other Documentation: Munsell, page 281.

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

#### Feature Name:

# Grace Chapel of First Reformed Church

# **Historic Site Report**

Common Name: Grace Chapel of First Reformed Church

Inventory Number: 1431-0028 Acroterion Number: 1431-028





Map Location Picture

#### LOCATION AND SURROUNDINGS

Address: 513-535 TURNPIKE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: FIRST DUTCH REFORMED CHURCH Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures: Grace Chapel is located on the same parcel as the Giles Mandeville House (1431-0026) and the main building of

the Reformed Netherlands Dutch Church (1431-0017), both surveyed individually. The parcel also includes a

modern church building and a cemetery.

Surrounding Environment: Downtown Commercial

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Religious Chapel Present Use: Church

Construction Date Range: 1870 To 1870 Source of Date: Church records

Date Comments: 1870 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Gable-front, rectangle 5 bays deep

Builder: null Foundation: Stone

Style Type: Carpenter Elements Type: null

Primary Style: Gothic Elements Status: null

Secondary Style: null Details Status: null

Tertiary Style: null Number of Stories: 2.0

Influence: null Number of Bays: 3

Style Comments: null

Exterior Wall Fabric:	Painted brick
Roof / Chimney(s):	Front gable roof clad in asphalt shingles.
Fenestration:	Multi-paned lancet windows with stone sills and brick dripmolds.
Additional Architectural Description:	Apex of front gable-end decorated with exceptionally ornate jigsawn ornaments and quatrefoil knee braces. Projecting gabled vestibule clad with board and batten siding and diagonally set boards.
History:	The Chapel was constructed in the 1870s by the First Reformed Church, and continues to serve as a chapel today.
Significance:	According to the NJ HPO, Grace Chapel of the First Reformed Church is eligible for the National Register as "an excellent surviving example of Carpenter Gothic architecture."
	ASSOCIATED SURVEYS

#### **Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): Historic American Building Survey (HABS): State Register (SR): Historic American Engineering Record

**Delisted Info:** 

(HAER):

World Heritage Site (WHS):

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: High Threats to Feature: No Threat National Register Eligibility: Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: Key-contributing outstanding example of its period or style p provides information important to history Related Theme: Architecture Feature Comments: null Survey References: null

Other Documentation: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 2 2007 12:00AM	E. Burling	KSK	

Feature Name: 505 TURNPIKE

Common Name: 505 Turnpike

Inventory Number: 1431-0016

Acroterion Number: 1431-016





Map Location

**Picture** 

#### **LOCATION AND SURROUNDINGS**

Address: 505 TURNPIKE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: MARCY, WILLIAM Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

Deep set back with broad lawn; new parking lot added.

Surrounding Environment: Residential

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Commercial Office

Construction Date Range: 1890 To 1890 Source of Date: Field observation

Date Comments: 1890 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular center entry, double pile

Builder: null Foundation: Cement

Style Type: Eclectic Elements Type: null

Primary Style: Cottage Elements Status: Remain

Secondary Style: Shingle Details Status: Remain

Tertiary Style: null Number of Stories: 2.0

Influence: null Number of Bays: 6

Style Comments: null

Exterior Wall Fabric:	Wood shingle
Roof / Chimney(s):	Asphalt shingle clad side gambrel roof with large central gable dormer and smaller flanking dormers. One stone interior chimney with chimney pots; one brick end chimney
Fenestration:	Diamond-paned over single-light wood double-hung sash windows; single-leaf primary entrance
Additional Architectural Description:	Emphasis on roof massing and associated dormers is typical of the shingle style. Hipped porch roof merging into center gable dormer; large dormer has canted windows. Sun porch has been partially enclosed and crawl space cemented. Non-operable shutters have been added. Stone stairs to primary entrance.
History:	No associative history is known for this property; it does not appear on historic maps of the area. Based on field observation, it is thought to have been constructed around 1890. The building was used as a business in 1986 (William Marcy Agency).
Significance:	This Shingle style cottage reflects its original appearance to a large degree; this is an example of the Shingle style in Morris County. It is interesting for its relatively small scale for the Shingle style, and for its unique central gable/porch feature. The use of the side gambrel roof is not common for this type in Morris County. It is unclear whether this current style is the original appearance or a later adaptation. This is not a significant example of its style, period, or method of construction, nor is it known to be the work of a master (Criterion C)

example of its style, period, or method of construction, nor is it known to be the work of a master (Criterion C). It is not likely to be able to contribute information important to history or prehistory (Criterion D). The building is not known to be associated with significant people or events in the history of Pequannock, the state, or the nation (Criteria A and B). It is not eligible for the National Register.

World Heritage Site (WHS):

#### **ASSOCIATED SURVEYS Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): Historic American Building Survey (HABS): State Register (SR): **Historic American Engineering Record** (HAER):

**Delisted Info:** 

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# **INSPECTION DATA** Demolished Demo Date: null Integrity: High Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: null

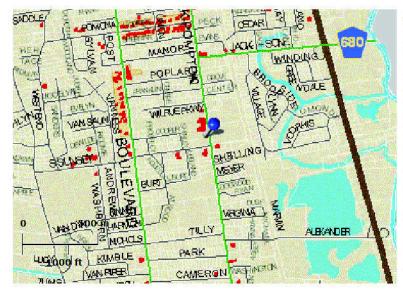
Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 4 2007 12:00AM	E. Burling	KSK	

Feature Name: Giles Mandeville House

Common Name: Giles Mandeville House

Inventory Number: 1431-0026 Acroterion Number: 1431-026





Map Location Picture

#### LOCATION AND SURROUNDINGS

Address: 513-535 TURNPIKE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: FIRST DUTCH REFORMED CHURCH Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

Located next to Reformed Church and "Friendship Hall," a modern building. Mandeville house is set behind a

Colonial Revival wooden fence on a well landscaped, large corner lot. The parcel is owned by the Dutch

Reformed Church, and the church building (1431-0027) and the Chapel (1431-0028) were surveyed individually.

Surrounding Environment: Downtown Commercial

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1788 To 1788 Source of Date: Dated tie-rods on east elevation

Date Comments: 1788

Additional Alteration Year: null

Architect: null Form/Plan Type: 5-bay double pile with 2-bay wing;

rectang. Plan

Builder: null Foundation: Stone

Style Type: null Elements Type: Dutch

Primary Style: Dutch Colonial Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 1.5

Influence: Dutch Number of Bays: 7

Style Comments: null

Exterior Wall Fabric: Roughly coursed fieldstone w/brownstone lintels

Roof / Chimney(s): Asphalt shingled side gable roof with 3 interior brick chimneys - 1 at either end of the main block, and one at

the end of the wing; 3 gable dormers on main block; shed dormer on wing

Fenestration: 12/8 wood double-hung sash windows with paneled shutters; 9/6 double-hung sash in gable dormers; 6-light

casement in shed dormer; 4/4 window in wing

Description:

Additional Architectural | Eaves are flush and gutter is boxed above frieze board. Door has 2 bullseye lights and entry is shielded by flat roofed porch on paneled posts. The dormers and porch are said to have been added sometime after 1868 by new owners, the Phillips family, who also made some interior changes (per 1986 survey).

History:

This house was constructed in 1788, following the marriage of Giles Mandeville to Sara Roome. The date is confirmed with stamps on the tierods above the windows, which are marked with "1 1 7 8 8," indicating January, 1788. Sarah and Giles' grandson, Giles P., later occupied half of the house following a renovation to convert the building into a two-family home. Giles P. and his wife shared the home with his parents, Peter, and his wife, Mary Van Ness. The Mandeville house is stylistically transitional, falling between the simplest and smallest Dutch houses like that of Henry Doremus in Montville and the considerably less common and more pretentious gambrel-roofed houses like the Martin Berry House. 1788 is two years after the marriage of Giles Mandeville to Sarah Roome, who's father Peter was said to have given the land to the couple. Tales of the house being a station of the underground railroad appear to be unsubstantiated.

Giles P. Mandeville later became the postmaster of Pequannock, and this building was used for a time as the post office. It was sold to the Phillips family in 1905, who converted it back to a single family home. In the early 20th century, the house was for sale, and a real estate brochure from the time details the interior of the house and its grounds (see Salvini, page 76-77). The house was purchased by the Dutch Reform Church in 1953, and serves as its manse.

It is rumored that the house played a part in the Underground Railroad, as Sarah Roome had a slave named Massy that she was quite close to; according to the Pequannock Planning Department, "house records show that 19 black and 19 white children were born in the house. Some of the black women, waiting to go to the next station in the underground railroad, were pregnant and gave birth in slave quarters above the kitchen."

Significance:

This house is associated with the Mandeville family, a prominent early family in the Lincoln Park area, but there is no evidence that Giles Mandeville made significant contributions to the history of Pequannock (Criterion B). The dwelling is not associated with significant events in the history of Pequannock (Criterion A). It is unlikely to be able to provide information important in history or prehistory (Criterion D).

This house is a significant example of the Dutch Colonial style in Morris County. It has distinctive details, and represents a transitional style of stone construction. The building has retained its original wood windows, operable shutters, and fieldstone exterior, as well as its basic original form. This dwelling is eligible for the National Register per Criterion C.

World Heritage Site (WHS):

Survey References:

Delisted Info:

Centennial address, "Ye Olden Dayes" Rev. Giles Henry Mandeville.

Ghosts of the Past: Historic Homes, Pequannock Township, NJ. Pequannock Twp. Planning Dept., 1974.

Emil Salvini, Historic Pequannock Township, 1987.

#### **ASSOCIATED SURVEYS**

Municipal ID: Nation	nal Register (NR):
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)
SHPO ID: Thematic No.	Iomination (TRA):
SHPO Opinion: Multiple Resor	urce Area (MRA):
Determination of Eligibility Multiple Property (DOE):	Submission (MPS):
fication of Eligibility (COE): Historic Americ	can Building Survey (HABS):
State Register (SR): Historic American E	Engineering Record (HAER):

# INSPECTION DATA | Demolished | Demo Date: | null | Integrity: | High | Threats to Feature: | No Threat | National Register | Eligibility: | Eligible | Criteria of | Eligibility: | District feature is within: | null | | B | associated | with specific events | District feature is within: | null | | Outstanding example of its period or style | | D | provides information important to history | | Related Theme: | Architecture |

Feature Comments: null

Survey References: Centennial address, "Ye Olden Dayes" Rev. Giles Henry Mandeville.

Ghosts of the Past: Historic Homes, Pequannock Township, NJ. Pequannock Twp. Planning Dept., 1974.

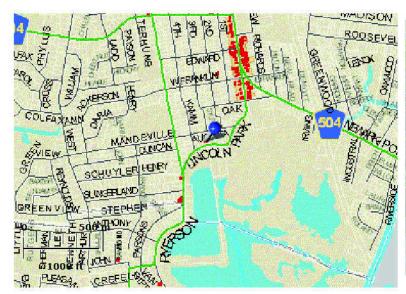
Other Documentation: HABS number assigned, but house never recorded.

Guter	Acroterion	
본 사		
Burling	KSK	

Feature Name: H. Mandeville House

Common Name: H. Mandeville House

Inventory Number: 1431-0003 Acroterion Number: 1431-003





Map Location Picture

#### **LOCATION AND SURROUNDINGS**

Address: 81 LINCOLN PARK RD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: ARNOLD, CALVIN C & ALICE A Ownership Type: Private

Ownership Info: Arnold Highlands: PLAN AREA

Siting and Related Structures:

Dry-laid stone wall along the front of the property; small barn toward the rear of the house.

Surrounding Environment: Residential

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1840 To 1840 Source of Date: Field observation; owner information (1986)

Date Comments: 1840 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Block and wing; double pile

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: Italinate

Primary Style: Italinate Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: null Number of Bays: 6

Style Comments: Vernacular and Vernacular Italianate.

Exterior Wall Fabric: Clapboard

Roof / Chimney(s): Side gables with molded eaves & partial returns

Fenestration: 6/6 wood double-hung sash windows; 3-light awning window in wing, above the porch roof

Description:

Additional Architectural Small wing with 3-bay facade with front door (now closed in) appears to have been a classic East Jersey cottage, modernized when the large wing was built. Italianate features of the later portion include molded window heads and full-length ground floor façade windows, double doors beneath a transom and round-arched attic windows. Screened in porch. Open porch on smaller wing, with flat roof supported by 4 chamfered wood

posts. Rear shed roof addition.

History: Another of the many Mandeville houses, this displays a classic block-and-wing configuration like that of the

Nicholas Slingerland house. The small wing may be early 19th century (or somewhat earlier). In 1986, the owner claimed that tax records confirm its existence by 1839. Surviving interior features of large wing are stock Italianate millwork of the second half of the 19th century. Historic maps from 1853 and 1868 place an "H.

Mandeville" in this approximate location.

This building is an example of vernacular construction. The construction history of the building is unclear, Significance:

> and it is not known which portion of the house is original, nor when subsequent additions were added. It is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals. The Mandevilles were a prominent family in the area, but it is unclear which member of the family occupied this dwelling (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The

building is not eligible for the National Register.

Lightfoot and Gill, 1853 Map of Morris County; Survey References:

Beers, FW. 1868 Map of Morris County; Interview with Mrs. Arnold, owner (1986).

#### ASSOCIATED SURVEYS

Municipal ID:	National Register (NR):
Morris County Historic Preservation Element 1976;	National Historic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):
SHPO Opinion:	Multiple Resource Area (MRA):
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):
Certification of Eligibility (COE):	Historic American Building Survey (HABS):
State Register (SR):	Historic American Engineering Record (HAER):
Delisted Info:	World Heritage Site (WHS):

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#### **INSPECTION DATA**

Demolished	Demo Date: null		
Integrity:	Medium		
Threats to Feature:	No Threat		
lational Register Eligibility:	Not Eligible		
Criteria of Eligibility:			
A associated	with specific events	District feature is within:	null
B associated	with prominent individuals	Contribution to district:	null
outstandin	g example of its period or style		
D provides in	nformation important to history		
Related Theme:	Architecture		
Feature Comments:	null		

Survey References: Lightfoot and Gill, 1853 Map of Morris County;

Beers, FW. 1868 Map of Morris County;

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: A. Mandeville House

Common Name: A. Mandeville House

Inventory Number: 1431-0010 Acroterion Number: 1431-010





Map Location

**Picture** 

#### **LOCATION AND SURROUNDINGS**

Address: 8 CAMERON AVE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: KINNANE, KAREN Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

House sits at slight diagonal to road with facades oriented north-south. The lot is obviously a remainder of a

farm property now surrounded by a 1950's subdivision.

Surrounding Environment: Residential

5

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1850 To 1850 Source of Date: Field observation; maps

Date Comments: 1850 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Side-hall with 2-bay addition and small

wing

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: null

Primary Style: null Elements Status: null

Secondary Style: null Details Status: null

Tertiary Style: null Number of Stories: 2.5

Influence: Dutch Number of Bays: 7

Style Comments: Vernacular

Exterior Wall Fabric: Asbestos shingle; wood shingles in addition

Roof / Chimney(s): Side gable roof clad in asphalt shingles; 3 interior brick end chimneys

Fenestration: 1/1 double-hung sash replacement windows. Two primary entrances - one double-leaf in the main block and one

single-leaf in the 1-story wing.

Additional Architectural

C

**Delisted Info:** 

Description:

The first 3-bay section of this house has the exceptionally broad gable-end and flush eaves suggestive of an early date. Double doors and façade porch are a Victorian addition that may have been added concurrently with the 2-bay addition. The smallest wing with several additions has an enclosed porch masking its north elevation. Asbestos shingles in the gable end of the 2-story addition.

Aspestos silligles in the gable end of the 2-story addition

History: Like the Terhune House on Franklin Avenue, this house establishes the agricultural character of the lands between Turnpike and Boulevard in the 19th century, The Mandevilles (spelled Mandeville and Mandeville in

various documents) owned large acreage here. This is one of the simplest farmhouses surviving in Pequannock. Despite its present day surroundings, it strongly evokes early 19th century farmsteads.

According to Parr, the house was oriented in this direction (southeast) because of a Dutch tradition. He states that the "three bay north east section is said to be the original house. This is a reversal of the usual Dutch building sequence in which the smaller one and a half story wing would have been built first and as the farm prospered and the family grew the two-story structure would have been added. The original porch

of the small wing has been enclosed..."

Significance: This building is an example of vernacular construction. Although it has retained a relatively high degree of

integrity, it is not known to be a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not

World Heritage Site (WHS):

eligible for the National Register.

Survey References: Lightfoot and Gill, 1853 Map of Morris County;

http://www.pequannocktownship.org/documents/historic/amandeville.htm;

Parr, George. "A History of Pequannock Township."

#### ASSOCIATED SURVEYS

Municipal ID:	National Register (NR):
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):
SHPO Opinion:	Multiple Resource Area (MRA):
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):
ertification of Eligibility (COE):	Historic American Building Survey (HABS):
State Register (SR):	Historic American Engineering Record (HAER):

#### INSPECTION DATA

Demolished	Demo Date: null		
Integrity:	Medium		
Threats to Feature:	Alterations		
National Register Eligibility:	Not Eligible		
Criteria of Eligibility:			
A associated	d with specific events	District feature is within:	null
B associated	d with prominent individuals	Contribution to district:	null
outstanding	ng example of its period or style		
provides in	nformation important to history		
Related Theme:	null		

Feature Comments: Style Influence-"Dutch" pertaining to the house's SW orientation.

Survey References: Lightfoot and Gill, 1853 Map of Morris County;

http://www.pequannocktownship.org/documents/historic/amandeville.htm;

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: The Osborn

Common Name: The Osborn

Inventory Number: 1431-0008 Acroterion Number: 1431-008





Map Location

**Picture** 

#### **LOCATION AND SURROUNDINGS**

Address: 12 JACKSONVILLE RD

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: SOLOOK, GREGORY P & TIMOTHY E Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures: This building sits on a large lot in a suburban neighborhood of Pequannock. Considering the age of the

surrounding houses, this must have been the first house on the street. Other lots are now small and typical of

suburban development.

Surrounding Environment: Residential, Suburban

Subdivided

#### ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1916 To 1929 Source of Date: Sears Roebuck Catalog date

Date Comments: 1916-1929

Additional Alteration Year: null

Architect: null Form/Plan Type: null

Builder: null Foundation: Cement

Style Type: null Elements Type: Other

Primary Style: Bungalow Elements Status: Remain

Secondary Style: Craftsman Details Status: Remain

Tertiary Style: null Number of Stories: 1.0

Influence: Other Number of Bays: null

Style Comments: null

Exterior Wall Fabric:	Aluminum siding
Roof / Chimney(s):	Cross gable roof clad in asphalt shingles with swept gable apex; 1 exterior brick chimney
Fenestration:	Multi-light-over-single pane windows
Additional Architectural Description:	Oriental influences apparent here in the roof shape and porch posts. Blocky stuccoed porch piers topped by clusters of 4 wooden posts, which are now encased in aluminum siding.
History:	A number of Sears & Roebuck, and other catalogue-type houses, have been noted in Morris County. This building is an example of the "Osborn," one of the most distinctive bungalows marketed by Sears. This style was offered between 1916 and 1929. It is an example of mass production in housing, and illustrates World War I-era taste in domestic architecture. It includes such typical features as stucco cladding, with brick and stucco piers, and multi-light-over-one wood double-hung sash windows. Timber porch posts are currently obscured by aluminum siding.
Significance:	The building is an example of Sears and Roebuck construction from the 1920s. The exterior of the building has retained a good degree of integrity. Typical features of an "Osborn" include clustered columns, stucco cladding, masonry piers, and an oriental peak at the roofline. This house exhibits some of these standard construction details; however, the aluminum siding now covers the stucco cladding and encases the clustered timber columns (Criterion C). Removal of the siding to reveal intact features, assuming they are intact, would increase the significance of this building.
	The house is associated with the expansion and increasing suburbanization of Pequannock Township in the 1920s. However, this is merely due to the house's construction date, and therefore this is not a significant association (Criterion A). The dwelling is not known to be associated with significant people (Criterion B), nor is it likely that the building will be able to provide information important in history or prehistory (Criterion D)

#### ASSOCIATED SURVEYS

Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)	
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	
Delisted Info:	MALVO SARRIMO CAS SARRAS ANGRESIANO	

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#### INSPECTION DATA

Demolished	Demo Date: null	
Integrity:	Medium	
Threats to Feature:	Alterations	
National Register Eligibility:	Not Eligible	
Criteria of Eligibility:		
A associated	d with specific events  District feature is within: null	
B associated	d with prominent individuals Contribution to district: null	
outstanding	ng example of its period or style	
provides in	nformation important to history	
Related Theme:	Architecture	
Feature Comments:	Influence-Oriental.	
Survey References:	Stevenson, Katherine Cole & Jandl, H. Ward, "Houses by Mail," 1986, p.203;	
	Thorton, Rosemary. "Finding the Houses that Sears Built: A Guide to the 60 Most Popular Designs, 30.	" 2004 p

#### Currently Viewing Survey Data 2 of 2

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Aug 1 2007 12:00AM	E. Burling	KSK	

**Feature Name: Dutch Reformed Manse** 

**Common Name: Dutch Reformed Manse** 

Acroterion Number: 1431-015 Inventory Number: 1431-0015





Map Location

**Picture** 

## LOCATION AND SURROUNDINGS

512 TURNPIKE Address:

Municipality: Pequannock **Zip Code:** 07440

Owner at time of survey: FIVE TWELVE TURNPIKE ASSOC LLC Ownership Type: Private

Ownership Info: Highlands: PLAN AREA null

Siting and Related Structures:

Occupies a lot opposite Sunset Road and next to old Chilton Memorial Hospital on major arterial road. A

formerly associated frame stable is located on an adjacent lot due to the subdivision of the property.

Surrounding Environment: Downtown Commercial

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Religious Other Present Use: Residential Multi-Unit

**Construction Date Range:** To 1894 Source of Date: First Reformed Church publication 1894

Date Comments: 1894

Additional Alteration Year: null

Architect: Form/Plan Type: Side-hall, rectangular massing null

**Builder:** Brick, Stucco Covered null Foundation:

Style Type: Eclectic Elements Type: Queen Anne

Primary Style: Queen Anne Late **Elements Status:** Remain

Secondary Style: null **Details Status:** Removed

**Tertiary Style: Number of Stories:** null 2.5

Influence: Queen Anne Number of Bays: 4

Style Comments: null

Exterior	Wall Fabric:	Clapboard
LMCC.IO.	······································	olapboala

Roof / Chimney(s): Irregular, steep, asphalt shingle-covered hipped roof with 1 interior stuccoed chimney

Fenestration: 1/1 vinyl double-hung sash with snap-in dividers

Description:

Additional Architectural Engaged semi-octagonal tower rises through porch roof. During a field visit in 2004, County staff noted that since the 1986 survey, the front porch has been enclosed, and vinyl siding and inoperable paneled shutters have been added. Furthermore, a 2-story, 2-bay segment had been added to the side, and a former arched window at the second story has been replaced by paired 1/1 double-hung sash windows. A 2006 site visit noted that additionally, the former slate roof has been replaced with asphalt shingles, and the chimney has been stuccoed.

This dwelling was built as the Dutch Reformed Church manse in 1894. Not a large number of Queen Anne eclectic houses were built locally at the turn of the century. This is not a particularly distinguished example architecturally, although it was associated with the Reformed Church. No house appears in this location on the 1853 or 1868 maps of Morris County.

## Significance:

This building is an example of the Queen Anne style; however, alterations have greatly affected its overall integrity. It is not a significant example of its style, type, period, or method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

ASSOCIATED SURVEYS	
Municipal ID: National Regi	ister (NR):
Morris County Historic vation Element 1976:	ational Historic Landmark (NHL)
SHPO ID: Thematic Nomination	ion (TRA):
SHPO Opinion: Multiple Resource Ar	ea (MRA):
rmination of Eligibility Multiple Property Submiss (DOE):	sion (MPS):
on of Eligibility (COE): Historic American Build	ding Survey (HABS):
tate Register (SR): Historic American Enginee	ring Record (HAER):
Delisted Info: World Heritage Si	ite (WHS):

## Integrity: Low Threats to Feature: Alterations National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null C outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: Religious Other-Served as Pastor housing.

Survey References: First Reformed Church Memorial 1736-1936 by Rev. Eugene H. Keator

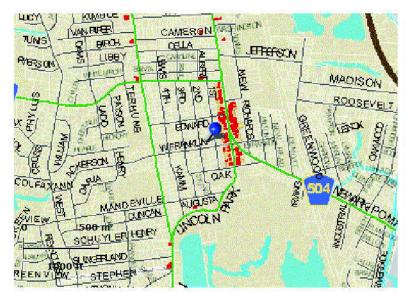
Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: A. Terhune House

Common Name: A. Terhune House

Inventory Number: 1431-0005 Acroterion Number: 1431-005





**Picture** 

Map Location

## LOCATION AND SURROUNDINGS

Address: 36 W FRANKLIN AVE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: SHERIDAN, THOMAS J Ownership Type: Private

Ownership Info: Mr. & Mrs. John Johnson Highlands: PLAN AREA

Siting and Related Structures:

House is sited with gambrel end to road facing east on the remainder of an agricultural property which has been

subdivided for residential lots.

Surrounding Environment: Suburban Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1810 To 1830 Source of Date: Map; field observation

Date Comments: 1810-1830 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Main block is side hall plan; 3-bay flanking

wings

Builder: null Foundation: Stone

Style Type:VernacularElements Type:FederalPrimary Style:FederalElements Status:Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.0

Influence: Federal Number of Bays: 4

Style Comments: Federal

Exterior Wall Fabric: Clapboard

Roof / Chimney(s): Side gambrel roof clad in asphalt shingles with side gable asphalt shingle clad wings; 3 brick end chimneys

Fenestration: 6/6 wood double-hung sash windows and 1/1 wood double-hung sash; modern casements. Lunette attic

window on the main block.

Description:

Additional Architectural Main block is 3-bay side hall plan with oversized entry consisting of broken entablature paneled pilasters and leaded transom and side lights, all set within molded architrave with corner blocks. Flanking wings have been

successively altered; one has shed porch and rear addition.

History: Historic maps show that this house was built prior to 1853, and was occupied at that time by A. Terhune.

Samuel Baxter owned it in 1863. Pequannock Township's "Ghosts of the Past: Historic Homes" states that originally this started as a small house and was added on to over the years ... It is obvious that this was a family of wealth and no expense was spared on the house." The Moore family later purchased the house in the early 1900s. Parr states that "the north wing may have been the original building [but] there are have been so many interior changes that it is difficult to evaluate much beside the center hall and stairs." The

chimney and fireplace were added in the 1980s.

According to the Acroterion survey, this house serves to illustrate the agricultural character and use of the flat and fertile lands between the Turnpike and the Boulevard, and together with several other houses, shows evidence of a local interest in Federal architecture. The land around the house was sold in the 1920s and 1950s

as a speculative venture, according to Parr.

Significance: This building is an example of vernacular construction; it is not a significant example of its method of

> construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No information is known about the Terhune or Baxter families and their significance in Pequannock. No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area

(Criterion A). The building is not eligible for the National Register.

Survey References: Lightfoot and Gill, 1853 Map of Morris County;

Beers, FW. 1868 Map of Morris County;

Ghosts of the Past: Historic Homes, Pequannock Township, Planning Department, 1974; Parr, George. "A History of Pequannock Township: Our Two Hundred and Fiftieth Anniversary."

## ACCOCTATED CHOVEVE

ASSOCIATED SURVEYS	
Municipal ID: National Register (	(NR):
orris County Historic vation Element 1976:	d Historic Landmark (NHL)
SHPO ID: Thematic Nomination (T	rra):
SHPO Opinion: Multiple Resource Area (M	IRA):
mination of Eligibility  (DOE):  Multiple Property Submission (	MPS):
n of Eligibility (COE): Historic American Building S	Survey ABS):
ate Register (SR): Historic American Engineering R	lecord

(HAEK):

World Heritage Site (WHS): Delisted Info:

## INSPECTION DATA

	INSPECT	ION DATA	
Demolished Demo Date:	null		
Integrity: Medium			
Threats to Feature: No Threat			
National Register Eligibility: Not Eligible			
Criteria of Eligibility:			
associated with specific	events	District feature is within:	null
B associated with prominer	nt individuals	Contribution to district:	null
outstanding example of i	ts period or style		
provides information impo	ortant to history		
Related Theme: null			
Feature Comments: null			

Survey References: Lightfoot and Gill, 1853 Map of Morris County;

Beers, FW. 1868 Map of Morris County;

Other Documentation: null

## Currently Viewing Survey Data 2 of 2

Survey Person	Organization	
R. Guter	Acroterion	
E. Burling	KSK	
	R. Guter	R. Guter Acroterion

Page 3 of 3

Feature Name: Pompton Plains Train Station

Common Name: Pequannock Railroad Station

Inventory Number: 1431-0032 Acroterion Number: 1431-033





Map Location

**Picture** 

## LOCATION AND SURROUNDINGS

Address: 33 EVANS PL

Owner at time of survey: PEQUANNOCK TOWNSHIP

**Municipality:** Pequannock **Zip Code:** 07440

Ownership Info: null Highlands: PLAN AREA

Strictship Intol

Siting and Related Structures:

The building sits adjacent to abandoned railroad tracks, and across the street from the new Pequannock Fire

Station.

Surrounding Environment: Downtown Commercial

.

Ownership Type: Private

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Railroad Station Present Use: Abandoned/Ruins

Construction Date Range: 1872 To 1872 Source of Date: NR Nomination

Date Comments: 1872

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular

Builder: null Foundation: Combination

Style Type: null Elements Type: Stick

Primary Style: Stick Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 1.0

Influence: null Number of Bays: 3

Style Comments: Stick

Board and batten
Slate-clad side gable roof with deep overhanging eaves
Wood 2/2 double-hung sash windows with metal storms
The distinguishing feature of this small station is its huge chamfered stick brackets. Decorative detailing includes simple wooden stringcourse below the windows and a water table. The track side elevation includes a bay window. The door on the west side is a modern replacement.
See information contained in the National Register nomination for this property.
Only a few late 19th-century stations survive in Morris County to illustrate the character of rail facilities before the enormous expansion of the early 20th century. According to the NR Nomination, this station is "a fine example of early railroad architecture with Carpenter Gothic features and unusual 'Dutch Cap' wooden hood moldings over the doors and windows." The NJ HPO has stated that the station "is significant because of its association with the 19th century Pompton Plains community as a rare surviving remnant of the Montclair and Greenwood Lake Railway and its successors. It is also architecturally significant as an noteworthy (sic) example of the application of the Stick style to a small public transportation building"

	ASSOCIATED SURVEYS	
Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic La	andmark (NHL)
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

## **INSPECTION DATA**

Demolished	Demo Date:	null		
Integrity:	High			
Threats to Feature:	No Threat			
National Register Eligibility:	Listed			
Criteria of Eligibility:				
A associated	d with specific e	events	District feature is within:	null
B associated	d with prominen	nt individuals	Contribution to district:	null
outstanding of the contraction o	ng example of it	ts period or style		
provides in	nformation impo	ortant to history		
Related Theme:	Transportation	; Architecture		

Feature Comments: null

Survey References: NR Nomination

SHPO Opinion: 5/8/2001

Other Documentation: null

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Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Aug 1 2007 12:00AM	J. Davies	KSK	

Feature Name: Henry Van Ness House

Common Name: Henry Van Ness House

Inventory Number: 1431-0013 Acroterion Number: 1431-013





Map Location Picture

## LOCATION AND SURROUNDINGS

Address: 414 TURNPIKE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: PASSARO, GENE A & B C Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

This building sits close to the road, with its primary entrance perpendicular to the street. It occupies a large

lot.

Surrounding Environment: Residential, Suburban Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential

Construction Date Range: 1803 To 1803 Source of Date: Plaque; field observation

Date Comments: 1803

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular

Builder: null Foundation: Not Visible

Style Type: Vernacular Elements Type: null

Primary Style: null Elements Status: Removed

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 1.5

Influence: null Number of Bays: 4

Style Comments: null

Exterior Wall Fabric: Vinyl siding

Roof / Chimney(s): Irregular side gable roof clad in asphalt shingles; 2 brick interior chimneys

Fenestration: Vinyl 1/1 double-hung sash windows with snap-in dividers and faux shutters; irregular fenestration due to

multiple building periods; single leaf entrance

Description:

Additional Architectural This building is comprised of two 1 1/2-story blocks connected by a shorter 1 1/2-story block with a shed roof, gable wall dormer, and open shed roof porch with turned posts. (Porch roof appears to have been extended since 1986.) The original portion of the building is adjacent to the Turnpike. The Turnpike facing facade featured an exposed fire back and interior chimney in 1986; these are gone in 2006. Later wings are added in a straight line towards the rear of the property. Entire house (including well house) is covered with synthetic siding. Skylights have been added since the 1986 survey.

According to Parr, this building's proximity to the road may have been because it functioned as an early toll house. He also notes that the "southern exposure and chimney construction indicate Dutch influence." It appears on an 1853 map of Morris County, labeled as "H.C. Van Ness." It was renovated during the 1950s and 1960s by the Adams family.

Significance: This building is an example of vernacular construction; it is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). Additions and alterations have compromised the building's integrity, including the addition of synthetic siding and vinyl windows, and more recent addition of skylights. It does not reflect its early function as a toll house. There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

ASSOCIATED SURVEYS		
Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)	
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

# Integrity: Low Threats to Feature: Alterations National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null C outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: Elements Removed-Door.

**Survey References:** Lightfoot and Gill, 1853 Map of Morris County;

Parr, George G. A History of Pequannock Township, Morris County, New Jersey: Our Two Hundred and Fiftieth

Anniversary, p. 230.

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

## Historic Site Report Common Name: 420 TURNPIKE

Common Name: 420 Turnpike

Inventory Number: 1431-0014 Acroterion Number: 1431-014





Map Location

**Picture** 

## **LOCATION AND SURROUNDINGS**

Address: 420 TURNPIKE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: HELLYER, J. & PATTERSON, A. & M. Ownership Type: Private

Ownership Info: Mrs. C. Edwards Highlands: PLAN AREA

Siting and Related Structures:

According to the Acroterion survey, this building occupies a 1-acre remnant of farm property that once stretched

to the Pompton River. As of 2006, the location and landscaping still manage to reflect a 19th-century environment. The building occupies a large lot in a residential section of Pequannock, along a major north-

south route through the borough.

Surrounding Environment: Residential Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1886 To 1886 Source of Date: Owner's records (1986); 1887 map

Date Comments: 1886

Additional Alteration Year: null

Architect: null Form/Plan Type: Center entrance, double-pile plan

Builder: null Foundation: Brick

Style Type: Eclectic Elements Type: Stick

Primary Style: Planbook Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Stick Number of Bays: 5

Style Comments: null

E161

Page 1 of 3

Exterior Wall Fabric:	Wood clapboard
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Roof / Chimney(s): Asphalt clad cross gable roof with interior and exterior brick chimneys

Fenestration: 2/2 wood double-hung sash windows; 1/1 vinyl double-hung sash replacement windows with snap-in dividers.

Symmetrical on primary façade. Two-story bay with painted reveals on side elevation. Faux 2-panel shutters

on second story

Additional Architectural Description:

This basically simple vernacular farmhouse is ornamented with stick style brackets, turned columns, carpenter's gothic jigsaw trim, and saw-toothed board and batten gable ends. There is an open cross-gabled porch with turned balustrade and columns. A small rear wing appears to be early 20th century. Faux shutters were added between 1986 and 2006. A cement block garage stood behind the house in 1986, but was not visible during the 2006 survey,

This dwelling was built circa 1886. According to the Acroterion survey, this farmhouse illustrates how the folkbuilding tradition of the area with its Dutch influenced architecture had all but expired by the last quarter of the 19th century, even for farmhouses; the essentially simple house is an example of machine-made ornament and construction members. A house in this approximate location appears for the first time on an 1887 map of Morris County, but is not labeled with an owner. No associative history is known about this property.

Significance:

This is an example of an Eclectic farmhouse from the last part of the 19th century. The building does not contain distinctive details that would make it an outstanding example of its style, nor does it appear to have influenced trends in the area. It is not known to be the work of a master (Criterion C). It is not known to be associated with significant events or people in the history of the Pequannock area (Criteria A and B). It is not likely to be able to provide information important in history or prehistory (Criterion D). This building is not eligible for the National Register.

Register (NR):	Municipal ID:
National Historic Landmark (NHL)	Morris County Historic Preservation Element 1976:
nination (TRA):	SHPO ID:
ce Area (MRA):	SHPO Opinion:
ıbmission (MPS):	Determination of Eligibility (DOE):
n Building Survey (HABS):	Certification of Eligibility (COE):
gineering Record (HAER):	State Register (SR):
ge Site (WHS):	Delisted Info:

		INSPECTI	ION DATA	
Demolished	Demo Date:	null		
Integrity:	Medium			
Threats to Feature:	No Threat			
National Register Eligibility:	Not Eligible			
Criteria of Eligibility:				
A associated	with specific e	vents	District feature is within:	null
B associated	with prominent	individuals	Contribution to district:	null
outstanding	g example of its	s period or style		
D provides in	formation impo	rtant to history		
Related Theme:	null			
Feature Comments:	Note - In Pequa "Schmidt/Edwa		this house is referred to as th	e "Worthington House" and the
Survey References:	Robinson, 1887	7 Atlas of Morris Count	у	
Other Documentation:	null			

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

## Feature Name: 41 JACKSON AVE **Historic Site Report**

Common Name: 41 Jackson Avenue

Inventory Number: 1431-0031 Acroterion Number: 1431-032





Map Location **Picture** 

## LOCATION AND SURROUNDINGS

Address: 41 JACKSON AVE

Municipality: Pequannock **Zip Code:** 07440 Owner at time of survey: LAMPE, WILLIAM F & KIM R Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures: Sits adjacent to (now unused) railroad tracks, along Jackson Road. Backs up to 1940s-1950s subdivision

Surrounding Environment: Downtown Commercial Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1900 To 1900 Source of Date: Field observation

Date Comments: 1900 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Side entry; single pile

Builder: null Foundation: Painted rubble stone

Style Type: null Elements Type: Other

Primary Style: Cottage Elements Status: Removed

Secondary Style: East Jersey Details Status: Removed

Tertiary Style: null Number of Stories: 1.5

Influence: null Number of Bays: 2

Style Comments: null

Exterior Wall Fabric:	Asbestos siding
Roof / Chimney(s):	Side gable roof with flush eaves; 1 interior gable-end chimney
Fenestration:	Modern 1/1 vinyl replacement windows and 2/2 wood double-hung sash in the side gable end; 1/1 vinyl window at basement level.
Additional Architectural Description:	Addition to side has single leaf pedestrian entrance with 2-paneled door, and a wood paneled pull down garage door; shed roof portico with concrete stoop at primary entrance supported by 2 wood posts.
Histor <b>y</b> :	Reference to the map sequence is inconclusive in this case. The 1853 map notes the existence of a "Stillery" at this approximate local, but the 1868 map places the "Distillery" on the opposite side of the road and depicts nothing where the house stands.
Significance:	This is an example of an East Jersey cottage-style dwelling. Alterations, including the replacement of windows, and additions, including a low, flat roofed garage at the side, have altered its form and reduced its integrity so that it no longer reflects its original construction (Criterion C). Little historic information has been found for this property, and it is not known to be associated with significant events or people in the history of Pequannock, the state, or the nation (Criteria A and B). This house is not likely to be able to provide information important to history or prehistory (Criterion D). It is not eligible for the National Register.

	ASSOCIATED SURVEYS
Municipal ID:	National Register (NR):
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):
SHPO Opinion:	Multiple Resource Area (MRA):
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):
Certification of Eligibility (COE):	Historic American Building Survey (HABS):
State Register (SR):	Historic American Engineering Record (HAER):

World Heritage Site (WHS):

**Delisted Info:** 

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## Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events B associated with prominent individuals C outstanding example of its period or style p provides information important to history

Related Theme: null

Feature Comments: null

Survey References: Lightfoot and Gill, 1853 Map of Morris County.

Beers, F.W., 1868 Atlas of Morris County.

Other Documentation: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: 382 TURNPIKE

Common Name: 382 Turnpike

Inventory Number: 1431-0009

Acroterion Number: 1431-009





Map Location

**Picture** 

## LOCATION AND SURROUNDINGS

Address: 382 TURNPIKE

Municipality: Pequannock Zip Code: 07440

Owner at time of survey: BENSON, ROBERT & WOODS, SUSAN Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

This dwelling is set far back beyond modern building lines of adjacent houses. A 1-car garage is located at the

rear of the property.

Surrounding Environment: Residential

5

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1825 To 1875 Source of Date: Field observation

Date Comments: Mid-19th century

Additional Alteration Year: null

Architect: null Form/Plan Type: Side-hall type, double pile

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: Italinate

Primary Style: Italinate Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Italinate Number of Bays: 3

Style Comments: null

Exterior Wall Fabric:	Synthetic siding
Roof / Chimney(s):	Side gable roof clad in asphalt shingles; hipped dormers.

Fenestration: 1/1 vinyl double-hung sash windows; single leaf primary entrance

Description:

Additional Architectural Simple block has been altered with polygonal façade bays and a 1-story open porch with replacement turned posts, balustrade, and spindlework. Entire right side is recent addition, according to owner in 1986. Paired Italianate brackets at main roof cornice. Two-story addition at left contains one-car garage on first floor.

This house was included in the Acroterion survey as evidence of the radical alterations many simple vernacular structures are subjected to: it has no known associative significance, and its architectural integrity, like its neighbor to the north, is badly compromised. According to the Acroterion survey, the entire right side is an addition. It is likely that the left side, which contains a first-floor one-car garage, is also a more modern addition. According to the website Njtaxmaps.com, this property was built in 1966; it is likely that this date reflects a major renovation to the dwelling, and not actual new construction. The house is not identified on historic maps of Pequannock. Alterations to the property have also been implemented since the 1986 survey, particularly the replacement porch features.

Significance:

This house is not a significant example of its style or period of construction, and is not known to be the work of a prominent architect (Criterion C). Alterations and additions have changed the building, and it no longer reflects its original construction. It is not likely that this building will be able to provide information about history or prehistory (Criterion D). It is not associated with significant events in the history of Pequannock or the area (Criterion A). The dwelling is not known to be associated with significant individuals in the Pequannock area (Criterion B). This property is not eligible for the National Register.

	ASSOCIATED SURVEYS	
Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic	: Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

## **INSPECTION DATA** Demolished Demo Date: null Integrity: Low Threats to Feature: Alterations National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: Note-No photograph for 1986. Survey References: Acroterion survey www.Njtaxmaps.com

Other Documentation: null

Survey Date	Survey Person	Organization	
Mar 7 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: 35 OPING RD

Common Name: 35 Oping Road

Inventory Number: 1431-0043 Acroterion Number: 1431-046





Map Location Picture

## LOCATION AND SURROUNDINGS

Address: 35 OPING RD

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: RICHARD, JOHN Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

House occupies medium lot surrounded by a 1950's-era subdivision; a garage is located near the dwelling, off to the side.

Surrounding Environment: Residential, Suburban Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1900 To 1900 Source of Date: Field observation

Date Comments: 1900 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: null

Builder: null Foundation: Brick

Style Type: Vernacular Elements Type: null

Primary Style: null Elements Status: null

Secondary Style: null Details Status: null

Tertiary Style: null Number of Stories: 2.5

Influence: null Number of Bays: 5

Style Comments: Vernacular

Exterior Wall Fabric: Asbestos shingles Roof / Chimney(s): Slate clad side gable roof with projecting eaves; 1 interior brick chimney with chimney pot; 1 exterior brick chimney Fenestration: 2/2 double-hung sash windows (material unknown), symmetrical across façade Additional Architectural This building's historic character has been largely erased by successive alterations. Second story slightly Description: overhangs the first story; shed hoods over second-story windows on west elevation. A 1-story shed roof addition is located on the side of the building, with a deck connecting the dwelling to the garage; there is an enclosed porch on the opposite elevation of the house. The building is largely obscured by shrubs and trees, making detailed architectural description difficult (2006). History: According to the Acroterion survey, this building is not on 19th century maps, and may have been moved to this location. No associative history has been uncovered for this property. Significance: According to the Acroterion survey, successive alterations have reduced this building's ability to reflect its original 19th century appearance. The building was largely obscured by shrubs during the 2006 survey, so

According to the Acroterion survey, successive alterations have reduced this building's ability to reflect its original 19th century appearance. The building was largely obscured by shrubs during the 2006 survey, so architectural integrity is unclear at this time. Additionally, the building may have been moved to this location. There is no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

ASSOCIATED SURVEYS		
Municipal ID:	National Register (NR):	
Morris County Historic Preservation Element 1976:	National Historic	Landmark (NHL)
SHPO ID:	Thematic Nomination (TRA):	
SHPO Opinion:	Multiple Resource Area (MRA):	
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):	
Certification of Eligibility (COE):	Historic American Building Survey (HABS):	
State Register (SR):	Historic American Engineering Record (HAER):	
Delisted Info:	World Heritage Site (WHS):	

## **INSPECTION DATA** Demolished Demo Date: null Integrity: Threats to Feature: Alterations National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null Survey References: http://www.pequannocktownship.org/documents/historic/1840sagefarm.htm

## Currently Viewing Survey Data 2 of 2

Other Documentation: null

Survey Date	Survey Person	Organization	
Jun 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: 10 OPING RD

Common Name: 10 Oping Road

Inventory Number: 1431-0041

Acroterion Number: 1431-044





**Map Location** 

**Picture** 

## LOCATION AND SURROUNDINGS

Address: 10 OPING RD

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: HUNT, HALSEY P 3RD & J Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

On a large landscaped lot with trees and shrubs.

**Surrounding Environment:** Residential

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential Single-Unit

Construction Date Range: 1910 To 1910 Source of Date: Field observation

Date Comments: 1910 +/-

Additional Alteration Year: null

Architect: null Form/Plan Type: Side hall entry, complex double pile

Builder:nullFoundation:UnknownStyle Type:nullElements Type:MultiplePrimary Style:OtherElements Status:Remain

Secondary Style: null Details Status: Removed

Tertiary Style: null Number of Stories: 2.5

Influence: Other Number of Bays: 2

Style Comments: Queen Anne/Colonial Revival hybrid

Exterior Wall Fabric:	Synthetic siding
Roof / Chimney(s):	Steep front gable roof clad in asphalt shingles; center brick chimney; wood cornice with partial returns
Fenestration:	1/1 and 6/1 wood double-hung sash windows; diamond pane window on secondary elevation
Additional Architectural Description:	Porch with boulder stone piers and paired and triple Doric wood columns; s-cut balustrade; single leaf entrance with wood/glazed door and 1/2 single pane sidelights; awnings added to windows after 1986.
History:	According to Pequannock Township, this is an early 1900s late Queen Anne/Colonial revival hybrid, a type not common in the Township, but it is typical of areas that became heavily suburbanized around the turn-of-the-century.
Significance:	Although this house is of an uncommon style for the area, it lacks distinctive details that would make it a significant example of its style. It is not a significant example of its method of construction, nor is it known to be the work of a master (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

ACCOCIATED CUDVEVC				
	ASSOCIATED SURVEYS			
Municipal ID:	National Register (NR):			
Morris County Historic Preservation Element 1976:	National Historic Landmark (NHL)			
SHPO ID:	Thematic Nomination (TRA):			
SHPO Opinion:	Multiple Resource Area (MRA):			
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):			
Certification of Eligibility (COE):	Historic American Building Survey (HABS):			
State Register (SR):	Historic American Engineering Record (HAER):			

World Heritage Site (WHS):

**Delisted Info:** 

## **INSPECTION DATA** Demolished Demo Date: null Integrity: Medium Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: null **Survey References:** http://www.pequannocktownship.org/documents/historic/ca1900.htm

## Currently Viewing Survey Data 2 of 2

Other Documentation: null

Survey Date	Survey Person	Organization	
Jun 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: 12 OPING RD

Common Name: 12 Oping Road

Inventory Number: 1431-0042 Acroterion Number: 1431-045





Map Location

**Picture** 

## LOCATION AND SURROUNDINGS

Address: 12 OPING RD

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: KLEIN, JEFFREY & HEIDI Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures:

Set back from the residential street. Pool in front lawn has been removed since 1986 survey.

Surrounding Environment: Residential

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Single-Unit Present Use: Residential

Construction Date Range: 1915 To 1920 Source of Date: Field observation

Date Comments: 1915-1920

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular, double pile

Builder:nullFoundation:StuccoStyle Type:RevivalElements Type:Tudor

Primary Style: Tudor Elements Status: Remain

Secondary Style: null Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Tudor Number of Bays: 4

Style Comments: null

Exterior Wall Fabric:	Stucco
Roof / Chimney(s):	Front double cross-gable roof with exterior brick chimney at front, and interior brick chimney at gable end
Fenestration:	Single and grouped 4/4 and 6/6 wood double-hung sash windows with brick surrounds; small shed dormer at second story.
Additional Architectural Description:	Double gables on façade are typical of Tudor Revival motif. Single leaf entrance with wood paneled door. 2-bay 1-story addition at side, with skylights, paired 6/6 windows, secondary entry, and exterior end brick chimney.
History:	There is no associative history known for this property.
Significance:	This is an example of the post World War I-era Tudor Revival style in Morris County, which is uncommon. However, it is not a significant example of its style or method of construction, nor is it known to be the work a master. It also did not appear to be the beginning of an architectural trend in the area towards that style

However, it is not a significant example of its style or method of construction, nor is it known to be the work of a master. It also did not appear to be the beginning of an architectural trend in the area towards that style (Criterion C). There is also no evidence that this building will be able to provide information important in history or prehistory (Criterion D). Research has not suggested a connection between this house and significant individuals (Criterion B). No historic information has been found to suggest that the building was associated with significant events in the history of the Pequannock area (Criterion A). The building is not eligible for the National Register.

World Heritage Site (WHS):

## **ASSOCIATED SURVEYS Municipal ID:** National Register (NR): **Morris County Historic** National Historic Landmark (NHL) Preservation Element 1976: SHPO ID: Thematic Nomination (TRA): **SHPO Opinion:** Multiple Resource Area (MRA): **Determination of Eligibility** Multiple Property Submission (MPS): (DOE): Certification of Eligibility (COE): Historic American Building Survey (HABS): State Register (SR): **Historic American Engineering Record** (HAER):

**Delisted Info:** 

## **INSPECTION DATA** Demolished Demo Date: null Integrity: High Threats to Feature: No Threat National Register Eligibility: Not Eligible Criteria of Eligibility: A associated with specific events District feature is within: null B associated with prominent individuals Contribution to district: null c outstanding example of its period or style p provides information important to history Related Theme: null Feature Comments: 1986-Owner refused permission to photograph. Survey References: null

Other Documentation: null

Survey Date	Survey Person	Organization	
Jul 1 1986 12:00AM	R. Guter	Acroterion	
Apr 1 2007 12:00AM	E. Burling	KSK	

Feature Name: Martin Berry House

Common Name: Martin Berry House

Inventory Number: 1431-0040 Acroterion Number: 1431-043





Map Location Picture

## LOCATION AND SURROUNDINGS

Address: 581 ROUTE 23

**Municipality:** Pequannock **Zip Code:** 07440

Owner at time of survey: BOGERT, CHARLES & ELEANOR Ownership Type: Private

Ownership Info: null Highlands: PLAN AREA

Siting and Related Structures: This building sits on a large lot, along modern day Route 23. The lot is wooded, separating the house from the

highway. The house sits at an angle to the road, with a semi-circular gravel driveway to the side of the house.

Surrounding Environment: Highway Commercial

Subdivided

## ARCHITECTURAL AND HISTORICAL DATA

Original Use: Residential Farmhouse Present Use: Residential Single-Unit

Construction Date Range: 1720 To 1720 Source of Date: NR nomination

**Date Comments:** 1720

Additional Alteration Year: null

Architect: null Form/Plan Type: Rectangular

Builder: null Foundation: Stone

Style Type: Vernacular Elements Type: Greek

Primary Style: Greek Elements Status: Remain

Secondary Style: Revival Details Status: Remain

Tertiary Style: null Number of Stories: 2.5

Influence: Greek Number of Bays: 5

Style Comments: Vernacular

Exterior Wall Fabric:	Clapboard and stone
Roof / Chimney(s):	Gambrel roof; 2 end brick chimneys
Fenestration:	Some windows on side elevation replaced with vinyl; fanlight in gambrel
	1-story gable roof (clad in wood shakes) addition to side; hipped roof 2-story porch with 2 wood columns on front façade; hipped roof dormer with craftsman windows.
	The building is obscured by heavy tree and shrub cover, and its location along Route 23, a major highway, makes detailed architectural description difficult. Additional information can be found in the NR Nomination.
History:	For historical information, see the National Register nomination for this property, available at the Morris Count Department of Planning and Development and the New Jersey Historic Preservation Office, Trenton, New Jersey
Significance:	This building is significant per Criteria A and C, and in the areas of architecture and settlement. The Berry family was one of the earliest families to settle in the Pequannock area. According to the National Register nomination, the Berry House "is an excellent example of what a wealthy Dutch farmer might own in the early part of the nineteenth century in northern New Jersey. It is one of the few Greek Revival structures in the stat (and certainly in Pequannock Township) that is still basically intact after over 150 years."

ASSOCIATED SURVEYS			
Municipal ID:	National Register (NR):		
Morris County Historic Preservation Element 1976:	National Histor	ic Landmark (NHL)	
SHPO ID:	Thematic Nomination (TRA):		
SHPO Opinion:	Multiple Resource Area (MRA):		
Determination of Eligibility (DOE):	Multiple Property Submission (MPS):		
Certification of Eligibility (COE):	Historic American Building Survey (HABS):		
State Register (SR):	Historic American Engineering Record (HAER):		
Delisted Info:	World Heritage Site (WHS):		

## **INSPECTION DATA**

Demolished	Demo Date: null		
Integrity:	Medium		
Threats to Feature:	Alterations		
National Register Eligibility:	Listed		
Criteria of Eligibility:			
A associated	with specific events	District feature is within:	null
B associated	with prominent individuals	Contribution to district:	null
outstandin	g example of its period or style		
D provides in	nformation important to history		
Related Theme:	null		
Feature Comments:	null		

Other Documentation: HABS survey, NJ-546

Survey References: National Register Nomination, Martin Berry House

Survey Date	Survey Person	Organization	
Mar 1 1986 12:00AM	null	Acroterion	
Apr 5 2007 12:00AM	E. Burling	KSK	