Greenwich Township Master Plan

December 1995

Prepared by the Greenwich Township Planning Board with assistance from the Cumberland County Department of Planning and Development

The original of this Master Plan was signed and sealed in accordance with with N.J.A.C. 13:41, State Board of Professional Planners.

(affix seal)

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INTRODUCTION

Introduction

In the Spring of 1993, Greenwich Township contracted with Cumberland County authorizing the County Department of Planning & Development to help the Township update its Master Plan and land use regulations. The old plan dated to 1970, updated with a Future Land Use Plan in 1978 and reexamined in 1982 and 1988.

It was decided that in addition to a revision of the background data, the County staff should focus on agriculture and rural land use issues, historic preservation, housing, recreation, conservation, and circulation plans. Planning board members expressed particular interest in planning for the Bayside Tract, the Greenwich Historic District, preservation of the rural landscape, and a plan for historic farmsteads.

It was also agreed that prior to the initiation of these plans, that a public meeting or workshop would be held to solicit citizen input and involvement. Workshops were held on October 6, 1994 and November 13, 1995.

The Greenwich Township Planning Board held a public hearing and adopted the plan on December 4, 1995.

Purpose of the Plan

If municipal master plans and land use ordinances can be viewed as part of a pyramid of municipal land use control, the master plan forms the base of the pyramid. It is from the information contained in the Master Plan that all other land use control originates. The Master Plan constructs the rationale for land use regulation in the Township. It establishes the framework for the zoning ordinance and the subdivision and site plan controls. Without a thorough justification in the Master Plan for the regulations of the zoning ordinance, that ordinance could be invalidated in the courts. Even though it may have no direct regulatory jurisdiction, the Master Plan sets the stage for subsequent land use regulations.

Plan Content as Required by Law

The content of the municipal master plan is defined in part by the requirements of the New Jersey Land Use Law. Article 3 of this law outlines the general parameters of the master plan and describes two mandatory elements of such a plan. They are 1) a statement of objectives, principles, assumptions, policies and standards upon which proposals for the physical, economic, and social development of the municipality are based; and 2) a land use plan element including but not limited to such things as topography, soil conditions, water supply, drainage, flood plain areas, marshes and woodlands. This land use plan element must also include an analysis of future land uses, the locations and boundaries for airports, and a statement of the standards of population density and development intensity that is recommended for the municipality. The Land Use Law also requires that the Plan indicate its regional relationships to other plans and the proposed impacts of the Plan on local zoning and land use regulations. Municipal planning board's may include additional elements at their discretion.

Overview of the Township Plan

The Goals and Objectives are presented first so that the reader knows upfront what the master plan is trying to attain and to give perspective to the presentation of all susequent information.

This is followed by background information on the Township, beginning with a summary of the history of the community. The regional setting of the municipality is examined along with the natural features. Population, housing, economic activities and land use are also reviewed. These sections comprise the background elements of the plan. They are presented to show trends and how they can influence the future land use in the Township.

The background information leads into the future land use plan. Special focus is placed on several important planning issues identified by the Greenwich Township Planning Board. Those issues are farmland preservation, the historic district and the cultural landscape, and the Bayside tract. Also included are a housing element and a comparison with other plans.

The Master Plan can be a very powerful tool in shaping the future of the community. To be a successful guide for community development, the goals and objectives of the Plan

need to be implemented. This occurs through zoning, subdivision regulation, and other land use management techniques. The promise of the Master Plan is only as good as the commitment to see it through. That responsibility rests jointly with the citizens and officials of the Township.

MASTER PLAN GOALS

Master Plan Goals

This section presents the Greenwich Township Master Plan goals followed by a discussion of objectives for achieving the goals.

Goals were established by the Township Planning Board after considering a range of desirable and undesirable potential future development patterns. A common theme of the goals is that the Township's historic resources are the most venerable feature of the community and require special attention. If neglected, an authentic, irreplaceable and still actively functioning community with direct roots extending back through 300 years of history could be irreparably altered by present and future development decisions. Therefore, development decisions should be made that fit within the existing context of the Township's historic resource base.

The Goals

The goals form the basis against which to consider future land use proposals. The Greenwich Township Planning Board has determined that the Master Plan goals are as follows:

1. PRESERVE THE EXISTING HISTORICAL CHARACTER OF GREENWICH VILLAGE, HEAD OF GREENWICH, SPRINGTOWN AND THE SURROUNDING COUNTRYSIDE.

2. PROTECT THE ENVIRONMENT AND NATURAL RESOURCE BASE.

3. MAINTAIN AGRICULTURE AS A MAINSTAY OF THE COMMUNITY.

4. DESIGNATE AND MANAGE THE CULTURAL LANDSCAPE AS A SPECIAL QUALITY OF LIFE FEATURE OF THE TOWNSHIP.

5. ALLOW FOR HOUSING OPPORTUNITIES THAT ARE IN KEEPING WITH THE EXISTING COMMUNITY CHARACTER.

6. PROVIDE FOR LIMITED, LOCALLY ORIENTED DEVELOPMENT OPPORTUNITIES.

7. PROVIDE FOR SUSTAINABLE ECONOMIC AND RECREATIONAL OPPORTUNITIES ADAPTED TO THE TOWNSHIP'S NATURAL RESOURCES.

Purpose and Objectives of the Goals

The goals serve as references for guiding the actions and decisions of the Planning Board through the rest of this decade or until this Master Plan is amended. The purpose of each goal should be reflected in subsequent zoning ordinances and development review standards of the Township. Objectives are more specific directions that the Township can pursue to reach a goal.

1. PRESERVE THE EXISTING HISTORICAL CHARACTER OF GREENWICH VILLAGE, OTHELLO, SPRINGTOWN AND THE SURROUNDING COUNTRYSIDE.

Purpose - to maintain the Township's authentic historical context as a major element of the present day community.

The unique, historic value of Greenwich Township is recognized by the National Register of Historic Places. Greenwich Township's historic character has survived relatively undisturbed and may be the largest, least changed colonial development remaining along the east coast. This character consists of two main interrelated elements: 1) the settlements of Greenwich village, Othello, and Springtown, and 2) the countryside surrounding and separating the settlements. New development within and around the historic resources can easily compromise the Township's historic value.

Objectives -
1) identify and maintain the unique attributes of each existing community;
2) control development in the countryside surrounding the villages;
3) expand the geographic area of the Greenwich village historical concept;
4) establish historically compatible building and design controls for new development.

2. PROTECT AND MAINTAIN THE ENVIRONMENT AND NATURAL RESOURCE BASE.

Purpose - to prevent environmental degradation and to preserve open space, wildlife habitat, environmental quality and natural resources for the continued enjoyment and benefit of future generations.

The natural environment has always played an important role in the daily activities of the community. It is relied upon for

clean water supply, recreational opportunities and scenic open space. It is also the habitat for game, nongame and endangered wildlife. However, even though the environment is productive and resilient, it is also fragile and susceptible to damage from development and over-use.

Objectives -
1) protect wetlands, woodlands and stream corridors from encroachment by development;
2) protect wildlife habitat and control public access;
3) require environmental controls on development to limit the impacts of lot clearing, fill and stormwater runoff;
4) buffer environmentally sensitive areas from development;

3. MAINTAIN AGRICULTURE AS A MAINSTAY OF THE COMMUNITY.

Purpose - to maintain the agricultural economy and landscape of the Township.

Historically, Greenwich Township has been an agricultural and seafaring community. Agriculture remains a prominent, viable, functioning activity but regional, statewide and national trends have for decades shown decreases in farmland acreage and the economic importance of agriculture. Agriculture is a preferred land use within the township that requires few municipal services. Farming warrants special attention to counter regional trends and improve its chances for the future.

Objectives -
1) maintain the farmland base by participating in farmland preservation programs;
2) buffer farmland from incompatible land uses;
3) allow for local sales of local agricultural products;
4) designate areas where farming is the preferred land use.
5) use innovative land use controls that address both land equity and land preservation issues.

4. DESIGNATE AND MANAGE THE CULTURAL LANDSCAPE AS A SPECIAL QUALITY OF LIFE FEATURE OF THE TOWNSHIP.

Purpose - to generate special attention and protection for the cultural landscape created by the interplay between nature and human actions.

The cultural landscape is a blend of land uses, building patterns, vegetation and natural features resulting from over 300 years of interplay between man and nature. It is the rural

atmosphere and authentic setting for the historic structures and farmland. The vagaries of the cultural landscape make measuring, defining and preserving it difficult tasks. Because it is a pervasive feature but loosely defined concept, it is not given the same attention as more tangible features such as buildings, wetlands and farmland. It involves views, distances and time on a scale larger than any single physical feature. The cultural landscape is as much a part of the Township's unique historical atmosphere and quality of life as any of the oldest structures and should be recognized with efforts to preserve and manage it.

Objectives -
1) identify the critical elements and locations of the cultural landscape;
2) gain community recognition of the cultural landscape concept;
3) undertake efforts to have the cultural landscape designated on the National Register of Historic Places;
4) incorporate preservation of the cultural landscape into land use controls;
5) maintain existing land use patterns.

5. ALLOW FOR HOUSING OPPORTUNITIES THAT ARE IN KEEPING WITH THE EXISTING COMMUNITY CHARACTER.

Purpose - to meet the housing needs of the Township without damaging environmental and historic resources.

Residential development has occurred slowly, predominately as single family owner occupied houses. Over half of the housing stock was built before 1940 and since then the construction rate averages about three new housing units per year. The housing stock must keep pace with population needs and still maintain the historic atmosphere.

The Township also has a small but required affordable housing obligation as determined by the NJ Council On Affordable Housing. It can meet this obligation in creative ways to match the existing community character. Rehabilitation can account for some of the units but a funding source for the rehabilitation work must be available. Alternatively, all units could be addressed through zoning provisions.

Objectives -
1) renovate existing substandard housing stock;
2) establish zoning districts where new construction can meet affordable housing requirements;
3) provide site and design standards for new housing to be

constructed compatible with the landscape and community character;
4) continue the trend for the majority of new housing to be individual, owner-occupied single family dwellings.
5) return abandoned houses to the available housing stock.

6. ACCOMMODATE LIMITED, LOCALLY ORIENTED DEVELOPMENT OPPORTUNITIES.

Purpose - to allow growth and development that serves community needs without damaging environmental and historic resources.

Change and development are inevitable and necessary even for traditional economic activities such as boat building, fishing and crabbing. Expansions, adaptations, modifications and alterations will be required if existing buildings, structures and land uses are to continue operating as time, tastes, technology and opportunities change. Each generation produces changes even within existing developments and buildings. Historic sites have modern amenities. These changes can be accommodated to minimize their effects on the historic integrity of the community.

Objectives -
1) provide a level of flexibility within preservation requirements that doesn't compromise historic values;
2) develop design standards for infrastructure and services compatible with the historic and natural resources;
3) require screening, buffering or strategic placement for items that can not be made compatible with the historic and natural resources;

7. PROVIDE FOR SUSTAINABLE ECONOMIC AND RECREATIONAL OPPORTUNITIES ADAPTED TO THE TOWNSHIP'S NATURAL RESOURCES.

Purpose - to allow economic and recreational activities that will not damage environmental and historic resources.

Natural resources have historically supported economic opportunities and development in Greenwich: the soil for farming and septic waste disposal, the open waterways for fishing and maritime travel, the wildlife habitat for hunting, groundwater for water supply and the natural landscape for artistic inspiration. These resources still exist to support the community, however, they have limited carrying capacities. They cannot support high level, intense usage. In keeping with

the existing community character, development should be limited by the sustainable limits of the natural environment.

Objectives -

1) establish limits on the use of natural resource
2) encourage economic activities that are both sustainable and traditional.
3) avoid the need and costs for infrastructure that would supersede natural carrying capacities.
4) promote existing boating and recreational centers as areas

BACKGROUND INFORMATION

The Regional and Geographic Setting

Quite often, the future of a community can be influenced by factors that are outside the control of local officials. As noted in the narrative of the history of the Township, this is particularly true in Greenwich. Many times in the course of the Township's history, its isolation, proximity to the bay, agricultural character, or vulnerability to the industrial demands of the northeast have played roles in the land use debates that have occurred in the community. These regional land use patterns, economic influences, and demographic forces can often affect the character of a municipality. When a community is in the path of rapid suburbanization, it is often difficult to withstand that kind of growth and development. Conversely, if a municipality is isolated by geography or the historic development patterns of a region, new development and economic opportunity are often difficult to sustain. That is why an analysis of the regional and geographic setting of a community is an important part of the planning process.

Geography

Located on the north shore of the Delaware Bay in southern Cumberland County, Greenwich Township is approximately 18.2 square miles in size. Physiographically it is located on the Atlantic Coastal Plain within the estuarine portion of the Delaware Bay, (**Map 1**).

Greenwich Township is bordered by Stow Creek Township to the north, Salem County to the west, the Delaware Bay to the south, and Hopewell and Fairfield Townships to the east. The villages of Springtown, Greenwich and Othello are the principal population centers in the community. Surrounding these small villages are some of the most fertile and picturesque farmlands in Cumberland County.

Greenwich has many tributaries of the Delaware Bay that form the borders of the Township or that are important natural features. Raccoon Ditch, a small waterway on the northern boundary of the Township, is a tributary of the Stow Creek, a sizable stream that empties into the Delaware Bay. On the southeastern border of the Township between Greenwich and Fairfield Townships is the Cohansey River which continues to play a major role in the development of the community. The Cohansey is a source of recreation and commerce for several small towns and communities along its course.

Access to the Mid-Atlantic Region

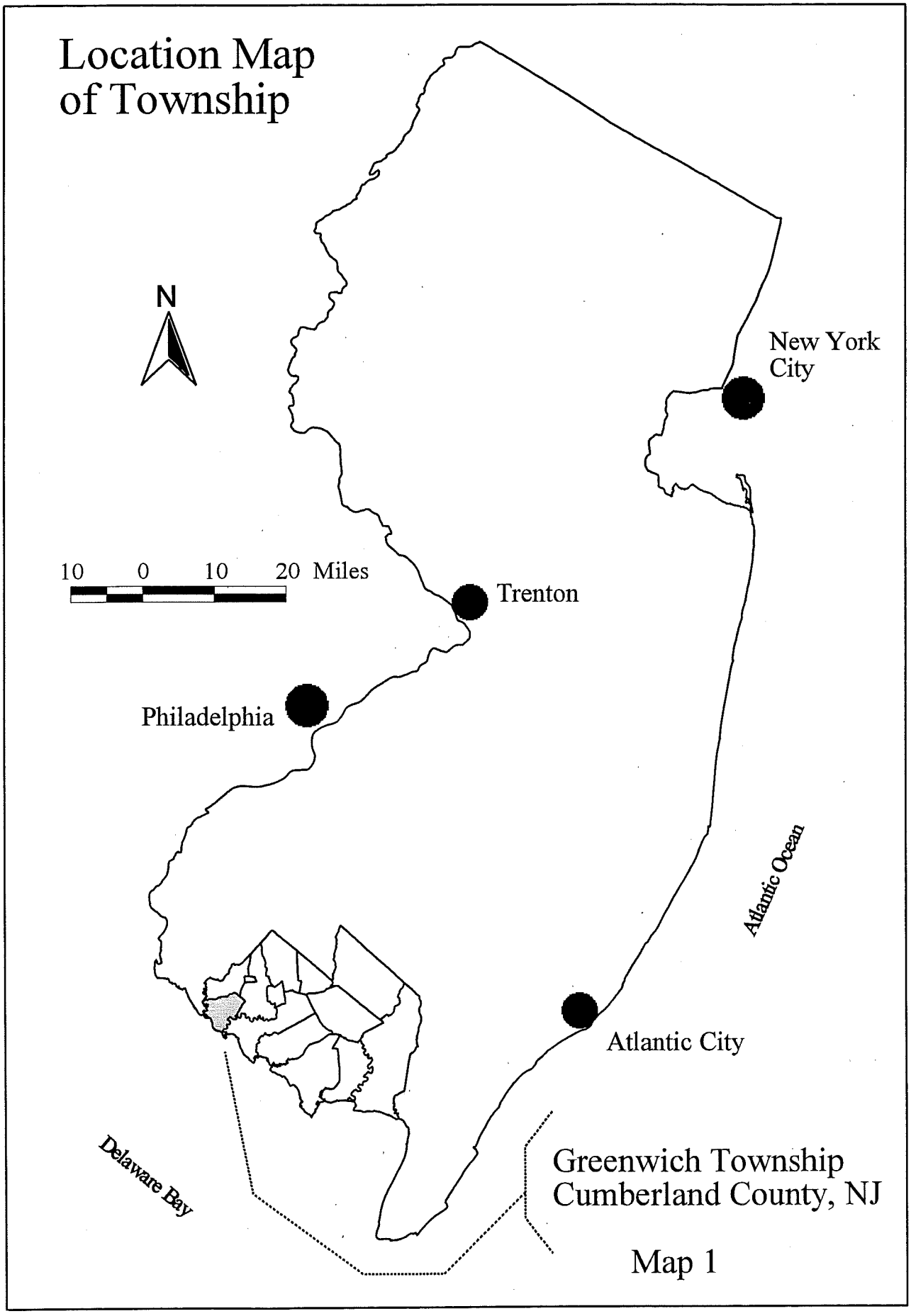
Despite the fact that Greenwich Township like much of Cumberland County has been isolated, there are several regional economic and population centers in proximity of the Township. Bridgeton, a small city of about 20,000 residents and the County seat, is a short drive north and east of Greenwich. In the larger, regional context, the Township is less than an hour's drive to the Delaware Memorial Bridge and interstate 95, connecting the Baltimore-Washington metropolitan area to Wilmington, Philadelphia, and New York. The greater Philadelphia urban area is only an hour to the north of Greenwich and Atlantic City is just over an hour's drive to the east. The moderate distances to these large population and employment centers will continue to play important roles in the future of the Township.

Links to the Cumberland County Region

Greenwich is not served by any major highway, rail network, or transit route. This fact is one of the reasons Greenwich has enjoyed relative isolation over the years. Only the Cohansey River provides a major link to greater Cumberland County and the region beyond. The shipyards marinas along the Cohansey River illustrate the importance of the waterway to the Township and surrounding area.

The recently inaugurated Coastal Heritage Trail provides another type of link to the region. The Trail ties together some of the cultural and historic themes that have been important facets of life in coastal New Jersey. For example, the maritime industry has long been part of the economic base of the Atlantic and Delaware Bay coasts. This industry continues to be part of Greenwich's heritage as evidenced by the ship building, recreation, and marina facilities that are present in the Township today.

The Township's geography, roads and transportation, water resources, culture and history link together and help define the regional setting of Greenwich Township. These factors will help to shape the Township's future. The challenge of the Master Plan will be to focus some of the regional influences in ways that promote the welfare and development of the municipality without compromising the rural and agricultural heritage enjoyed today by the Township residents.


Location Map
of Township
N
New York
City
10 0 10 20 Miles
Trenton
Philadelphia
Atlantic Ocean
Atlantic City
Delaware Bay
Greenwich Township
Cumberland County, NJ
Map 1

History

Nearly four hundred years ago, early in the 1600's, the "front door" to the area now known as Greenwich in modern day Cumberland County, was the Delaware Bay and the Cohansey River providing easy access to a sheltered safe port. The region was virtually inaccessible to and from the north. Greenwich became the most populated area along the bay coast by the early 1700's. But, this advantageous orientation to water began to change even before the County of Cumberland was created in 1748. The shift at first was upstream to the tidal limits and a river crossing. Today the center of population has moved 16 miles eastward to the urbanized Vineland-Millville area in response to development pressure from the north and east. Although Greenwich prospered for many years until the late 1700's, it became sheltered by the water, isolated, and with an almost static population for more than a hundred years....until the 1960's when the "front door" opened once again and let in a flood of controversy over economic opportunity versus industrial development threats to the environment.

Historical Events

How and why do these changes happen? History tells the story from early trade expansion, dwindling forests, remarkable agricultural development, depleted soils, recovery, impending changes from the bay, historic preservation, and current opportunities for development and tourism.

Early Exploration And Settlement

Native American Indians frequented the Greenwich area long before white settlers arrived. They were Algonkian speaking peoples. They called themselves Lenni-Lenape and lived here for a few basis reasons: game was plentiful, the climate comparatively mild, fishing was good and shellfish abounded. They derived their living from the soil and from hunting and fishing. Agricultural history in the area began with the Indians.

Native American Indians might have continued to live here indefinitely had not explorers penetrated the Delaware Bay in 1623. A few years later the first permanent colonization of southern New Jersey began when Sweden attempted to create a "New Sweden" on these shores between 1638 and 1650. Although their main settlements were further north and west, some

Swede-Finn farms and hunting camps existed along the bay shore. An authenticated Swede-Finn log structure circa 1650 discovered in lower Hopewell, now removed for restoration to Greenwich, is evidence of those pioneers. The Swedish government had by 1649 lost interest in its colony, but many of the colonists remained. The Scandinavians were followed by the Dutch.

The Dutch laid claim to a major portion of the eastern seaboard, including New Jersey. After alternating Dutch and English control, the Dutch era ended in 1664 with the passing of New Amsterdam to the British. The Dutch did little in the way of active colonization in this extreme southern area and had no real impact on the Greenwich area. The English dominated the events of the next hundred or more years and molded the character of the Greenwich area.

Groups of New Englanders had established small settlements south and east of the Cohansey River in the area known as Fairfield during the time of the Swedish and Dutch rule. They were descendants of the first New England Pilgrims and English Quakers and, with a sprinkling of Scandinavians, provided the original foundation for many families that continued to the present. To a large extent those who settled in this area, on both sides of the river, were seeking freedom to worship as they wished and established their churches promptly. The early Swedish explorations, however, were commercially inspired.

Laws of Great Britain

Under the laws of Great Britain all vacant lands, such as those in North America were deemed to belong to the King. Only he could give title and the monarch used the privilege freely for political advantage. With the surrender of the Dutch, Britain could consolidate its position on the eastern seaboard. The valleys of the Hudson and Delaware would no longer separate New England from the southern colonies. But to secure that objective, the land had to be occupied. Thus vast areas were given to family, friends, and political allies. They, in turn, granted title to establish their influence, become affluent, or attempt to settle their debts. Vast land schemes and real estate promotions were launched in Old England.

Fenwick's Salem Tenth

John Fenwick, an English Quaker seemed to have good connections among the ruling elite in England. He supposedly received a grant of land from an original grant of land later

known as the Jerseys. Fenwick arranged a series of financial and business deals that involved his partner William Penn, among others, that to this day have not been fully unraveled. Fenwick named his grant Salem, the place of peace. His first group of colonizers arrived in 1675 at what today is the City of Salem, and proceeded to purchase the land that presently comprises Cumberland and Salem counties from the Native Americans, with whom he enjoyed peaceful relations. Unfortunately he died nearly penniless and a broken man in August 1683. Just before his death he had conveyed all his interest in the Jerseys to William Penn, except the part which was called Fenwick's Colony, 150,000 acres or more. He appointed Penn and others his executors.

Founding of Greenwich

Additional arrivals under Fenwick's proprietorship led eventually to the establishment of a second town in the area. Originally named Cohanzick after a local Indian Chief, Greenwich nestled along the Cohansey River close to the Delaware Bay, was established in 1684 and for the next 75 or more years was to be the center of economic, social, and political activity in the area east of Stow Creek which is modern day Cumberland County. Greate Street in the village of Greenwich was laid out after Fenwick's death in accordance with direction in his will. From the Cohansey River about a mile northward the width was 100 feet and then 90 feet and finally 80 feet in width as it came to a stream of water at the Head of Greenwich. This was the basic site plan for a manor town, and perhaps in Fenwick's mind a future County Seat.

It soon became obvious that all of the inhabitants of Greenwich were in full and free practice of their sectarian religious principles. Quakers located their Meeting House near the river to accommodate worshipers from across the river. In 1707 the Presbyterians established their place of worship at Head of Greenwich, later to be known as Othello. The Church of England was established on Greate Street in 1729. This freedom and firm title to land plus government vested in the land owner and the proprietors were of incalculable value to the people and their political and social institutions.

In 1687 Greenwich on the Cohansey River had been designated an official Port of Entry. By the mid 1700's it had become a thriving colonial port with grist mills, saw mills, cabinet shops, and stores. It had attained a position of importance in the shipping trade of the colonies. Its Greate Street was lined with churches and homes of the prosperous inhabitants.

Religious freedom had eliminated the sectarian wars that had troubled New England. To Friends, who were the first of the English settlers may probably be ascribed the absence of those desolating wars with the Native Americans that prevailed in New England. They had come to cultivate their soil, were given the inducements to do so, gradually struggled out of subsistence farming, and produced surpluses to trade. They found what they wanted. Good soil, warmer climate, and sound titles to real estate. Greenwich grew faster than other settlements on the bay shore and maintained its influence until late in the 1700's.

Cumberland County is Born - 1748

The people living in the Cohansey and the Maurice River districts, as they were then called, tired of traveling the long distance to the court in the town of Salem to conduct business of a legal nature. They petitioned the Assembly of New Jersey to divide Salem County so that their section of Fenwick's Salem Tenth in West Jersey might be recognized as an independent political entity. The Colonial Legislature obliged on January 30, 1748 by passing an Act erecting the southern part of Salem County into a new county called Cumberland. The political process of becoming a self-governing body began promptly and marked the beginning of a change in the good fortunes of Greenwich.

The Act establishing the new county divided it into six townships: Greenwich, Hopewell, Stow Creek, Deerfield, Fairfield, and Maurice River. The Legislature ordered the Freeholders to meet first at Cohansey Bridge, which is now Bridgeton, to arrange for the taking of a poll to determine the location of the county seat. The first court was held at Greenwich and in December of the same year, 1748, Cohansey Bridge was chosen as the seat of county government. The selection was a compromise, Greenwich, Fairfield and Deerfield contending for the honor, the convenience and the practical advantage from a business stand-point.

A courthouse was built in 1752 at Cohansey Bridge, the tidal limits of the river, and the area grew rapidly thereafter. Greenwich, nevertheless remained the primary center of activity for another thirty years or more. But its economic and social development was being eclipsed by population shifts to the north and east, away from the Delaware Bay.

Protest Against British Tyranny

Dissatisfaction over Colonial rule had been increasing for a number of years in the British colonies. Greenwich

participated in this dissatisfaction and displayed it with civil disobedience on the night of December 22, 1774, a few months after the well-known Boston Tea Party. A group of patriotic citizens, disguised as Indians, seized a quantity of British-owned tea, arrived at Greenwich in the Brig Greyhound and burned it in the market square as a protest against British tyranny. This bold act shocked the community and generated a controversy which led to the crystallization of sentiment. Some took the cue and departed; there being today in Nova Scotia and other provinces numerous descendants of local families.

Early Colonial Farming

Available land and privileges associated with land induced arrival of new settlers and a culture of subsistence rural life emerged. During the entire colonial period and continuing even after the war for independence, agriculture in Greenwich was basically no different than in the rest of New Jersey or other of the original colonies. More than 85% of the population lived on farms. The farmer and his family produced practically all the necessities of life on the farm and sold the few surpluses.

Cutting firewood for shipment to Philadelphia and lumbering provided income for many and, of course, created the farmland. But declining supplies of wood and the receding of forests away from navigable streams caused some to leave for more profitable areas elsewhere. But for those who stayed on the land, the art of farming progressed rapidly. Local farmers became well informed. Water transportation and stage roads were developing. Local produce fed both the British and Colonial armies during the Revolutionary War. William Penn's Philadelphia had grown rapidly, far surpassing growth rates at Greenwich, and provided a good market for local products. Population in Greenwich Township reached a level not to be substantially altered to this day. The economic leadership of the county had moved up river and the center of population was moving eastward.

A decline in soil fertility became apparent by the early 1800's and as a consequence some farm families migrated elsewhere seeking more productive land. But eventually agriculture made a comeback. Farmers discovered that local deposits of green marl could be used as fertilizer, along with crop rotation, and the use of alfalfa hay to regenerate soil. Increased agricultural activity and production came in time to participate in the new regular and dependable trade made possible by steamboat. It was a giant step forward for the economy and was to prevail for many years, even after the

arrival of railroads which made the gains of steamship communication seem trifling. Subsistence farming was disappearing.

Commercial Agriculture Emerges

The era of commercial agriculture began with the arrival of railroads in the 1860's. Although diligence and hard work did not always pay off for the individual farmer, agriculture had become the primary economic activity in Greenwich. Railroad transportation provided a dependable and fast access to the cities that sustained agriculture. A Greenwich branch line was constructed in 1873 and later in the early 1900's pushed on to the piers at Bayside for shipments of sturgeon roe. But pollution and over fishing ended sturgeon and rail traffic on the line.

Greenwich Township's proximity to the South, and the anti-slavery sentiments of the Quakers, led to an extremely emotional involvement in the Civil War. Years before the war broke out, hundreds of slaves crossed the Delaware River to points in Cumberland and Salem Counties in their flight northward via the "Underground Railroad". Both Greenwich and a nearby crossroad settlement, Springtown, played a part in this era of flights to freedom.

With the beginning of the war of secession, citizens of Greenwich experienced the same patriotism that occurred in other parts of New Jersey. And, as at the time of the revolution, there was an element of division. Those Tories who persisted in their loyalty to the Crown in the 1770's moved to Canada and Nova Scotia. Years later, there were some who favored the South and slavery. But support for the Union predominated and did not subside. Great efforts were made to fill the requisitions and provide for those who were defending their country. Even among Friends, patriotism often ran higher than peace-loving disciplines.

Modern Day Agriculture

Modern day commercial agriculture began to take its present form at the turn of the 20th century. Productivity rose steadily with the decline of horsepower and the ascendancy of the motor vehicle and expanding use of chemicals. These marked the complete end of subsistence farming. Agriculture had become a business. While these remarkable changes were not confined to Greenwich farmers, some changes were particularly vigorous, evolutionary and the result of local efforts. A well known case in point was the Roork family's

pioneer development of asparagus varieties and its exploitation as a cash crop.

Greenwich quietly nurtured its agriculture as a major contributor to the economy for more than 200 years quite successfully. It had done so in spite of many challenges to survival. There were spin-off businesses as revenues generated by farm products circulated back into the local economy supporting services for equipment, feed, fertilizer and related items. The productiveness also supported at intervals food processors in Greenwich as well as elsewhere.

In the 17th century John Sheppard (1802-1882) did some canning, first in his residence, then in a larger plant, hired help and preserved many products. Many years later after the development of tomatoes and its increasing popularity, the R.S. Watson & Son cannery provided employment. Cohansey River towns, including Greenwich, built smaller vessels in the era of 1838 to 1905, and of course, provided not just the ship builders but also the ship captains to guide their products to market.
As a business, agriculture was a primary contributor to the township's economy. Farming created the full-time, part-time and seasonal employment opportunities in a variety of industries and occupations.

Frozen Food Industry Provides Year Round Market

In the era of modern-day commercial agriculture the most significant development in which Greenwich farmers participated was without a doubt the frozen food industry, providing a market outlet for vegetables over the entire year. The process was pioneered by the Seabrook family in a nearby township during a period when agriculture was in ferment. New crop irrigation techniques were developing. Soil testing was becoming an art. Research was developing improved vegetable varieties and the County Agricultural Agent arrived on the scene. Education became the key to successful farming. Greenwich farmers responded. They took the tested know-how skills organized by Seabrook and joined many other southern New Jersey farmers in a highly, mutually productive-profitable system. They helped to provide the quality crops that were in high demand to satisfy urban food needs and, later, "food-for-war" demands.

Compared to other industries, agriculture has historically provided a relatively stable economic base. Because farming was rooted to the land and farms were fixed in their location, the agricultural industry was not likely to move away in search of better opportunities. This makes agriculture a

serious consideration for the long term economic development of an area.

Much of the Township's agricultural land had been preferentially assessed under the Farmland Assessment Act of 1964. By reducing property taxes on farmland, farmers can better afford the production costs of business. It has become one of the major legislative supports for the agricultural community. However, where agriculture is the dominant local industry as in Greenwich, preferential treatment can place a burden on the non-farmer.

Location had spared Greenwich population pressures for many years. However, the old homes of Greate Street and vicinity were attracting buyers who wished to restore them and enjoy gracious county living.

Development Pressures Emerge

Property values and land values are traditionally low in rural areas. Dependence on land as a source of public revenue and personal income often generates insurmountable pressures to encourage industrial development. The promise of tax revenue from a new industry or a power plant is often irresistible. Many local governments find themselves caught in this pinch between promised new wealth and the desire to protect an existing environment and life style.

As so it came to pass in rural Greenwich in the 1960's.

"Straw Company" Buys Land

In 1965 the General Electric Company (GE) using a straw company called Overland Realty and working through local agents, began accumulating options on land around Greenwich. In three years they had most of the land fronting the bay. Although the sellers did not know what the land would be used for, they "covenanted" with Overland never to vote against any proposed zoning change. Over ninety owners, most of them farmers, sold one-third of the Township for $2.5 million. Atlantic City Electric (ACE) had exercised Overland (GE) options to amass 4,554 acres of prime agricultural land, woodland, and marsh along the entire bay shoreline and a portion of river frontage. The straw company was disbanded. ACE then mortgaged the property to Prudential Insurance Company for $4.5 million.

By then the scenario had become clear to local residents. Greenwich had been discovered not only by those wishing to buy and restore old homes, but also by international oil and

utility interests. "High and fast" land near the bay was an ideal place to bring oil from off-shore deep water port facilities yet to be built. A rapid succession of storage facilities, refineries, and related complex could follow and consume many more acres. A nuclear powered generating station would provide cheap power for new industry.

Citizen Reactions/Actions

Citizen conflict had begun to simmer at least as early, if not before, the option buying spree by Overland Realty in 1966. Conflict gained intensity as each event (or rumor) unfolded. Sensing that an effort to save the natural environment of the sensitive bay shore area would be an almost impossible task for such a small group of citizens in the face of powerful development interests, they chose instead to take steps to shield the historic, man-built village from the anticipated impact of spreading industrial development. Among their efforts was submission of an application for entry of the historic area on the National Register of Historic Places.

The Conflicting Interests

Things came to a head in a 1970 conflict between those citizens who would preserve the unique character of Greenwich and those who would increase its tax base. The Town's first zoning ordinance in 1966 had established a local historic district of 400 acres. Some citizens were unhappy with the local restriction. The 1970 zoning ordinance amendment cut the historic area to 80 acres and, zoning for ACE's acreage was changed to industrial despite local and county advice to the contrary.

Greenwich National Historic District

By then other changes had begun to take place. Citizens had succeeded in changing the composition of the Township Committee. The new Committee rewrote the zoning ordinance (1975). While the new ordinance prohibited oil storage, electric generating stations, and nuclear waste storage or disposals within the Township, it also set aside an area near Springtown for commercial development and another to the West for general industry. Furthermore, the Greenwich Historic District, Main Street, from the Cohansey River north to Othello, was entered on the National Register of Historic Places in January 1972. Under the National Historic Preservation Act of 1966, the Advisory Council on Historic Preservation (ACHP) is charged with reviewing and commenting upon federal, federally assisted, or federally licensed undertakings that have an effect upon properties included in

the National Register. The ACHP has no enforcement power, it can only review and comment. Nevertheless, Council procedures at that date appeared to offer some protection for the Historic District from adverse effects of industrial development. However, the crucial factor remained the determination of the local citizenry to protect their historic areas.

ACE Plans Emerge -1972

Although the community conflicts had begun before 1970, it was not until 1972 that the full extent of ACE plans began to emerge when a pipeline company applied to the Corps of Engineers for a permit to construct a deep water port in the Atlantic outside the Bay. Submerged pipelines would bring the crude oil from the port to the Bayside Tract. This same company soon afterward announced plans to build and operate a tank farm on the property. Rail lines would be restored to transport oil to refineries. Industry would come in, and a generating plant, too.

This combination of powerful interests concerned many more residents. They began to see more clearly that their range of choices about the future of their community was narrowing. But it was still far from clear what the fate of Greenwich and the Bayside Tract would be. And, in fact, to this day a land use for the tract acceptable to the community has not been determined.

For all its success in developing an agricultural economy, Greenwich had been caught in a bitter battle between economic and environmental forces. The Delaware Bay which for many years had helped to isolate and protect the Township, had instead posed a series of challenges to the future of the Township. But those events of the 1960's and 1970's also showed that citizens and local government can retain their historical prerogatives over purely local issues. The federal and state coastal legislation showed responsibility for regional impacts. Local people were concerned, however, that in the face of powerful interests, their range of choices about the future had been narrowed.

The utility company, PSE&G still owns the Bayside Tract which it acquired in 1975, 4,500 acres, 37% of the total Township land area. New Jersey coastal management zone laws have banned heavy industry near the bay shore and have withstood pressures to deviate. But tough local decisions remain to be made on how to achieve economic stability, the traditional way of life and preserve the environment.

Greenwich in the 1980's and 1990's

Having contended with powerful unknown interests in the 1970's and survived essentially as planned and plotted in 1684, Greenwich today, while no longer a busy commercial port of entry as in colonial days, is a recreational port of entry for those who travel the Intracoastal Waterway. Two marinas on the Cohansey River provide maintenance and repair services, food, and safe haven. It is also a "port of exit" for those who birth or day-haul their vessels to a launching site.

But most importantly, Greenwich remains as one of the few colonial villages in its original status in New Jersey. The township retains many of its 18th century landmarks. The village itself stands as a fine example of early New Jersey architecture. It's homes are well restored and maintained. Both historically and architecturally, Greenwich is a significant asset of New Jersey heritage. It may even be the least changed colonial town of national significance on the eastern seaboard. It is a gem to be safeguarded.

Among the landmarks is the Gibbon House (c. 1730), headquarters of the Cumberland County Historical Society, a restored house-museum and a village focal point. The Society has a large county-wide enrollment and active membership to promote a full program of activities ranging from research through restoration. It sponsors group tours of its museums and village, and several annual events such as a Craft Fair, Open House Tours, River Excursions, Antique Auction, and a "Christmas in Greenwich Celebration." The Society has cooperated frequently with government agencies particularly planning boards concerning land use, ecology, and services related to preservation.

Greenwich Township citizens face major land use issues today as they did in the 1960's. How the questions are answered will affect the future way of life in Greenwich. The options are greater now than earlier and more help is available than in recent years.

The Historical Society in cooperation with the community has promoted tradition, culture, and heritage in a special brand of tourism. The Society has demonstrated that this can be done while minimizing impacts on the environment and maintaining a good place to live, work, and farm.

The New Jersey Coastal Heritage Trail project was conceived and developed in a cooperative effort in which local, state, and federal agencies work together to recognize important aspects of our heritage. The Trail offers a partnership

program in which Greenwich might participate in protecting, reserving, and interpreting its significant natural and cultural resources while broadening its tourism and economic base.

Predictions that tourism in Southern New Jersey is on the verge of expansion are based on the realization that as a recreation resource the Delaware Bay region is underutilized and is accessible to a vast urban population. Greenwich has access to the bay. The river and the bay are at its doorstep.

A Glance Back - Lessons Learned

The history of Greenwich has been reviewed in an effort to find clues to prospects for the future. History shows that the Township has strong, deep, enduring roots in the past. Despite the losses which time has inflicted, what has been conserved is extraordinary. That observation applies to both natural features and man-made accomplishments. In Greenwich, the past is a major link to the future.

The key to the planning process is using the historic character of the community as a building block for both preservation and development objectives. Historic structures, agriculture, the rural lifestyle, and the links to river and bay are integral to the Township's past and present. How these elements are integrated as a vision for the community's future will be one of the principal challenges for the Master Plan.

Historic Sites

In 1972, Greenwich's historic uniqueness was recognized with the placement of the Greenwich Historic District in the National Register of Historic Places. An area running east and west of Ye Greate Street from Othello to the Cohansey was delineated and recorded with the U.S. Department of the Interior. The nominating form described Greenwich as "probably the least changed colonial town of national significance on the eastern seaboard". It is this aspect of Greenwich, more than any one building, event, or person associated with the Township, that has made it a State and National asset. Few municipalities can boast a similar concentration of historic structures in an undisturbed setting. Maintaining that setting should be one of the major goals of future land use regulation in Greenwich.

Maps 2 "Historic Sites" shows and lists historic sites and structures. The list does not purport to be complete. It

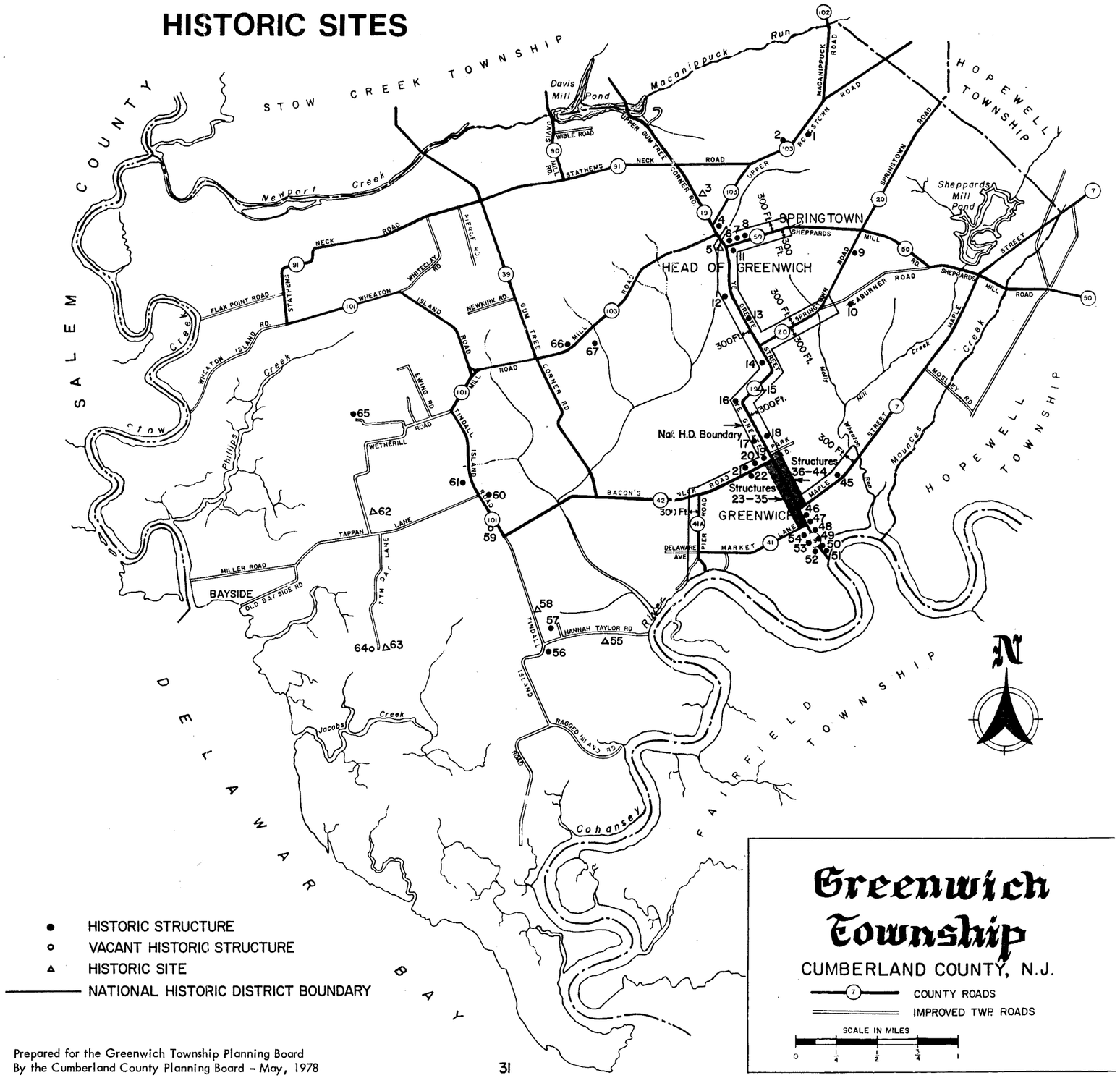
does include sites currently listed on the National, State, and County historic registers as well as buildings recorded by the Historic American Buildings Survey (HABS). But in a municipality with as rich and as diversified a past as Greenwich's, it is difficult to trace all significant sites. The Township, when updating its land use plan, should routinely update its historic inventory. As a reference to aid preservation efforts, **Map 3** shows building locations in Greenwich in 1876.

To maintain its prominence as a historic community and to benefit fully from the unique concentration of these sites, Greenwich must seek to preserve not only individual structures but also their setting. A number of sites exist outside the district boundary and are part of the Township's rural fabric of open country and farmland. The village of Greenwich, while somewhat more intensely developed, is complemented by this rural setting. All approaches to the historic district along Ye Greate Street are on rural roads free of strip development (in contrast to such historic areas as Williamsburg, Virginia and New Castle,, Delaware). The Township should maintain this rural setting through a policy of environmental preservation that encourages open space along roads leading to Ye Greate Street and on lands around the National Register District. The visual impact of development adjacent to or within historic areas should be reviewed and controlled to protect the historic fabric from uses which, through their scale or construction, reduce or destroy the rural and historic character.

As mentioned before, the list of historic sites is not complete. Sites are listed because of their architectural significance or their association with a known event or person. Most date from the eighteenth and early nineteenth centuries. However, the Township has many structures of more recent vintage which may also merit inclusion. Sites listed include ruined or abandoned shells of old building as well as the locations of recently demolished buildings and historic events.

HISTORIC SITES

1. Lupton Mills House (1782)
2. Tyler House (1786)
3. Ambury Hill (Cemetery, nineteenth century)
4. Robert Ayers House (1869)
   Noah Lanag's Arcade (1800)
5. Old Presbyterian Church Cemetery (18th century)
6. Campbell-Maskell Store (1796-1803)
7. Flanagan-Stathem-Landis House (1834)
8. Ward House (1760)
9. Bethel African Methodist Episcopal Church (1841)
10. Philip Vickers Fithian House (1747)
11. Presbyterian Church (1834)
12. Ewing-Gallagher House
13. Friends Meeting House (1857)
14. Stone School House (1811)
15. Friends Burial Ground
16. Charles Beatty Fithian House (1800)
17. James Ewing House (1773)
18. Foster Sheppard House (c. 1800)
19. Wood House (1795)
20. Frisby House
21. Philip Dennis House
22. Jobe-Stiles House (1765)
23. Richard Wood 3rd Store (1795)
24. Providence Wheaton House (c. 1850)
25. Presbyterian Lecture Room (1852)
26. Richard Wood House (c.1760)
27. Captain Charles Miller House (1860)
28. Daniel Sheppard House (1874)
29. George Bacon House (1811)
30. Pirate House (1734)
31. Benjamin Harding House (1734)
32. Isaac Harding House (1780)
33. James Josiah Ewing House (1834)
34. Dr. Thomas Ewing House (1742)
35. Tea Burning Monument (1908)
36. Old Stone Tavern (1728)
37. Nicholas Gibbon House (1730)
38. Swedish Storehouse & Granary (c. 1650)
39. Jeremiah Harding House (1780)
40. Nancy Griffith House (late 18th century)
41. Dr. Holmes House (1760)
42. Benjamin Reeve House (1737)
43. Josiah Fithian House (1714)
44. John Harding House (1785)
45. Clarkson Sheppard House (1835)
46. Job Watson House (1847)
47. Dr. Levi Bond House (1730)
48. Site of the 18th Century St. Stephen's Episcopal Church and Cemetery (1729)
49. Site of Dan & Seth Bowen Can House (1774)
50. Friends Meeting House (Orthodox) (1771)
51. Mark Reeve House (1685) and Site of Watson's Ferry (1733)
52. William Watson Tavern (1733)
53. Mark Reeve, Jr. House (1797)
54. Margarita Miller House (1820)
55. Bacon's Landing (1682)
56. William Bacon House
57. Hannah Taylor Farm (1730)
58. Bacon's Adventure
59. Brick house, Flemish bond with glazed stretchers (18th century)
60. Sheppard-Hancock House (1750)
61. Gabriel Davis House (1785)
62. Site of Philip Dennis House (1720)
63. Site of Glaspell House (18th century)
64. Maul House (18th century)
65. Morris Goodwin House (1800)
66. Vauxhall Gardens (17th & 18th centurys)
67. Brookside Farm (c. 1700)



● HISTORIC STRUCTURE
○ VACANT HISTORIC STRUCTURE
△ HISTORIC SITE
——— NATIONAL HISTORIC DISTRICT BOUNDARY

Prepared for the Greenwich Township Planning Board
By the Cumberland County Planning Board - May, 1978

Greenwich Township

CUMBERLAND COUNTY, N.J.

(7) COUNTY ROADS
IMPROVED TWP. ROADS

SCALE IN MILES
0 1/4 1/2 3/4 1

Map 2

Building Sites in 1876

Map 3

Natural Setting

The natural setting is important for the resources it provides and the people, land uses and economic activities it can attract and support.

Climate

Greenwich is located along the Delaware Bay between the Atlantic Ocean and the Delaware River. These water bodies tend to moderate and retard the seasons. The average monthly high temperature occurs in July (77 degrees) and the monthly low occurs in January-February (35 degrees). Prevailing wind direction changes with the season. In late fall, winter, and early spring, the direction is from the north or northwest. In summer, the wind shifts, coming from the south or southwest until early fall.

The Township's mild climate permits a relatively long growing season of 252 days which allows early spring plantings and late fall harvests. It also contributes an average annual rainfall of 42 to 43 inches. These factors, when combined with appropriate soil conditions, render large areas of the Township suitable for agriculture.

The monthly pattern of precipitation is relatively uniform. Approximately half of it falls between April and September during the growing season. As a result of tropical storms and hurricanes, maximum precipitation comes in late summer. The Township's location on the Bay makes coastal portions susceptible to tidal flooding which accompanies such storms. Other periods of heavy precipitation occur in the fall and early spring.

Topography and Slope

Slope is an important factor in determining surface drainage and erosion hazards and steep slopes may increase construction costs.

Greenwich is divided into two major topographic regions. Rolling hills predominate in the northwestern part of the Township. The Township's highest elevations and steepest slopes lie in that area with a high point of 104 feet near Davis Mill Road and Causeway Road. To the south and west, the Township's topography flattens with the elevation being no

more than 30 feet and dropping to sea level along the Delaware Bay, the Cohansey and Stow Creek.

Map 4 shows the slope of various areas in Greenwich. Their development potential can be broken down into three categories.

Slopes between 0%-10%. Slopes in this category present the fewest restrictions to development, with slopes between 2%-5% probably the most desirable since they provide natural drainage and are less likely to require regrading. Slopes lower than 1% may result in the ponding of water and thus require some drainage improvements.

Slopes between 10% and 15%. These slopes present some problems for development. Construction costs will be higher because more grading will be required for site preparation. Foundations and public utilities, such as roads and sewers, cost more because of engineering constraints. Stormwater runoff and erosion hazards increase in sloping soils. Septic tank fields must be carefully designed and constructed.

Slopes greater than 15%. Development should be steered away from slopes greater than 15%. They present development problems for grading, foundations, public utilities, and septic tank fields. Erosion and storm water runoff may pose severe problems. Such slopes are best suited for conservation uses such as parks, recreation, and open space.

Map 4 shows that the Township's steepest slopes are found in the northeast, particularly along Macanippuck Run, Chestnut Run, and Davis Mill Pond. Most slopes exceed 5% along the water courses there, and 10% slopes are common. Approaching the Township's tidal area along the Bay and the Cohansey River, the slope dips to below 5%. The village of Greenwich lies on terrain with a slope of less than 2%. In the tidal marsh, the slope is typically less than 1%.

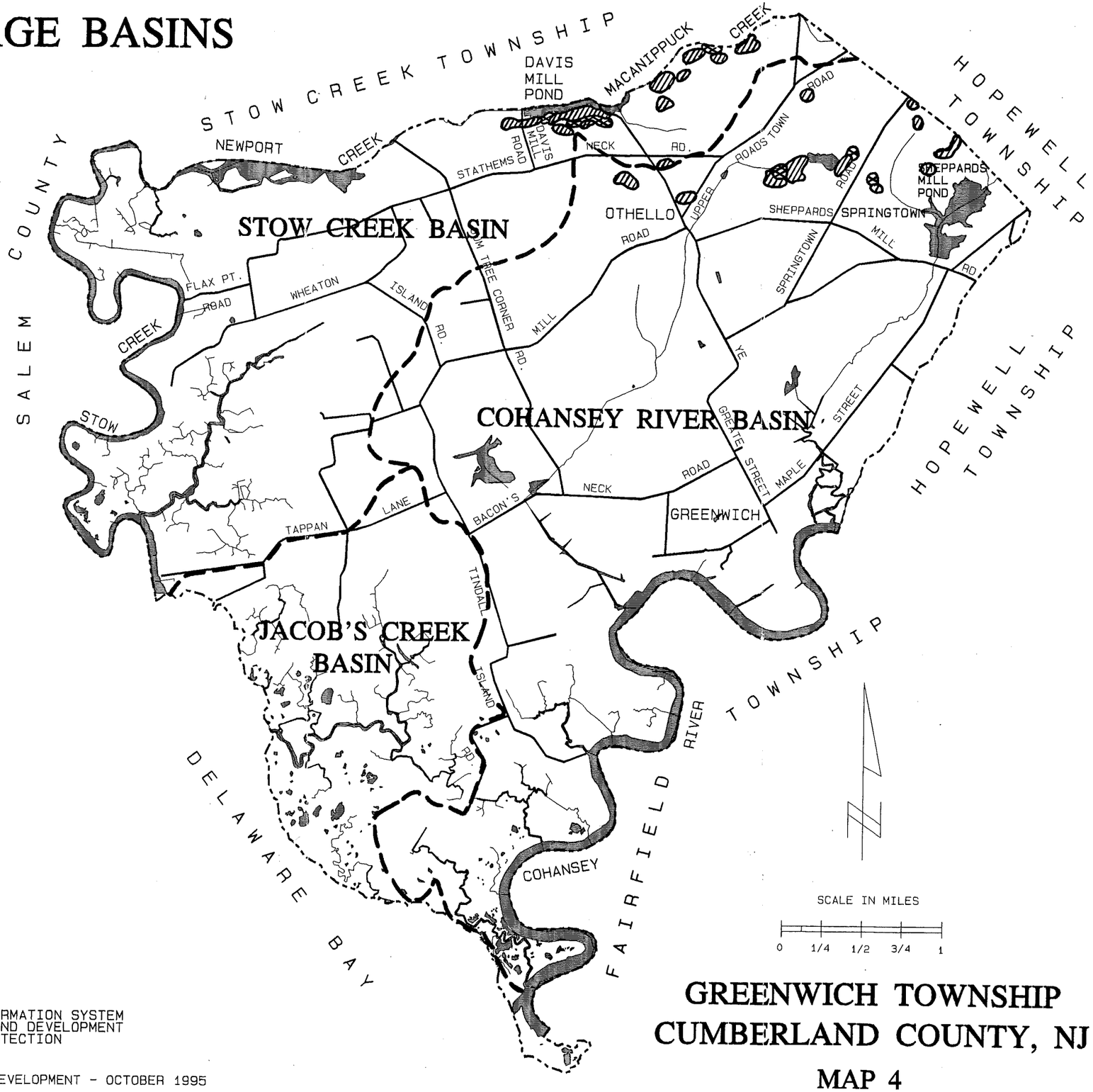
Drainage Basins

All of the Township's waters drain into Delaware Bay via one of three drainage basins: Stow Creek, Cohansey River and Jacobs Creek, also shown on **Map 4**. The Cohansey River drainage basin is the largest, covering the eastern, central and southern areas of the Township. Most of the Township's

SLOPE AND DRAINAGE BASINS

LEGEND

- 0 - 9.9 % Slope
- 10 - 14.9 % Slope
- 15.0 - Slope & Over
- Major Ridge Lines



DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
SOURCE: CUMBERLAND COUNTY DEPARTMENT OF PLANNING AND DEVELOPMENT
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 4

upland area drains into the Cohansey River via Cabin Creek, Mounce Creek, Wheaton Run, Sheppards Millpond, Mill Creek, and Pine Mount Creek.

The Stow Creek drainage basin covers the northwestern area of the Township and includes Phillips Creek, Raccoon Ditch (a.k.a. Newport Creek), Chestnut Run, and Macanippuck Run.

The Jacobs Creek drainage basin is a small area between Bayside and Tindall Island that flows directly to the Bay through the tidal marsh, Jacobs Creek and several other smaller creeks

Soils

The soil is both literally and figuratively an underlying control on the landscape of Greenwich Township. It is a major component of the natural environment and a primary determinant of rural land uses. Soil is not uniform throughout the Township. There are physical and chemical differences between soils. Changes in the landscape often reflect changes in the soil. Soil can affect the use of a site for a specific purpose. Some land is more suitable for certain uses than other land because of differences in the underlying soil. That is why some land is better farmland, or a better development site, or better wildlife habitat than other land.

The primary reference for local soil information is the Soil Survey of Cumberland County, New Jersey, issued April 1978 by the Soil Conservation Service of the U.S. Department of Agriculture. The Soil Survey classifies soils; describes their physical and chemical properties; and evaluates soils for crop production, wildlife habitat, engineering properties, land use planning and landscaping.

Soil Associations

Soil associations are distinct patterns and proportions of soils series that form identifiable landscapes. In Cumberland County there are six soil associations of which five can be found in Greenwich Township. Three associations cover most of Greenwich Township: the **Tidal Marsh**, **Hammonton-Fallsington-Pocomoke**, and **Matapeake-Chillum-Mattapex Associations**. Minor areas of the **Aura-Downer-Sassafras** and the **Evesboro-Klej-Lakewood Associations** also occur within the Township.

The **Tidal Marsh Association** occurs as a wide band along the Delaware Bay shore and up Stow Creek and the Cohansey River.

It forms the nearly level, very poorly drained, silty or mucky tidal flats and lowlands subject to daily tidal flooding. It has severe limitations for all urban uses.

The **Hammonton-Fallsington-Pocomoke Association** occurs next to the tidal marsh as a terrace at elevations between 10 and 50 feet above sea level. It is nearly level to gently sloping, moderately well-drained to very poorly drained, on uplands and lowlands. It has moderate or severe limitations for most uses because of a typically shallow seasonal high water table.
The **Matapeake-Chillum-Mattapex Association** occurs at the higher elevations to the north central portion of the Township. It is nearly level to sloping, well-drained to moderately-well drained on uplands areas. It has a shallow seasonal high water table in late winter and early spring that can adversely affect development.

Minor portions of the **Aura-Downer-Sassafras Association** occur along Macanippuck Run and Sheppards Millpond. A smaller portion of the **Evesboro-Klej-Lakewood Association** occurs west of Mill Creek along the Hopwell border.

Soil Characteristics

A significant proporton of the landscape patterns in the Township can be traced to the characteristics of the underlying soil. The soil characteristics influencing the landscape and land use in Greenwich Township the most are 1) agriculture capability, 2) suitability for septic systems, and 3) depth to seasonal high water table. Those characteristics place natural controls on where farming occurs, houses are built and land is undeveloped.

In general terms the soils in Greenwich Township are good for agriculture but can only support limited amounts of development without wastewater infrastructure because of a high seasonal water table. This situation is somewhat different from the typical case found in other areas of the Philadelphia - southern New Jersey region where farmland is high and dry, and can also support moderate densities of residential development without infrastructure.

The soil limitations for various land uses are rated in the Soil Survey as slight, moderate or severe.

> Slight means the soil properties are generally favorable and any limitations are easily overcome.
>
> Moderate means the limitation can be overcome by special planning, design or special maintenance.

Severe means that costly soil reclamation, special design and/or intense maintenance is required to overcome limitations.

An important caveat for using the Soil Survey is that the maps and information are generalized, meaning that an on-site study may prove that a specific site does not fall into the general category shown on a map. **Maps 5, 6 and 7** showing **soil capability classifications for agriculture**, **septic system limitations**, and **depth of seasonal high water**, respectively, are only intended to show general locations of limitations to be considered in land use decisions. Other factors such as location, accessibility, infrastructure and adjacent land uses also determine if a certain use is suitable for a particular site.

Soil Capabilities for Agriculture

The Soil Survey groups soils into eight agriculture capability classes to indicate general suitability for crops. Greenwich Township has soils in five of the eight classes. **Table 1** lists the soil types found in the Township by capability class.

Class I soils have few limitations that restrict their use.

Classes II through **IV** can be farmed with increasing limitations and more management.

Classes V through **VIII** have very severe limitations that limit their use to pasture, woodland or wildlife.

Class II soils are the predominant upland soils in the Township. Most **class II** soils are in agricultural production requiring moderate conservation practices. Most development, though small in total acreage, also occurs on **class II** soils. There is very little **class I** soil and most of it is farmed.

Class III soils underlie most of the wooded tracts but some **class III** acreage is farmed typically for nursery stock. Farming on **class III** soils has limited crop selection and requires special conservation practices. There are no **class IV, V or VI** soils in the Township.

Class VII soils underlie the stream corridors and the overgrown, upland areas northwest of Sheppards Millpond. The **class VII** soils have almost no clearing or development, and

have a natural vegetative cover. **Class VIII,** best left in its natural state, includes extensive areas of tidal marsh.

Map 5 shows the location of agricultural capability classes throughout the Township. The map combines the eight categories into four: **slight** (class I); **moderate** (class II); **severe** (class III and IV); and **impractical** (classes V, VI, VII and VIII).

TABLE 1

SOIL CAPABILITY CLASSIFICATION FOR AGRICULTURE of SOILS in GREENWICH TOWNSHIP

Suited for Cultivation

Class I (slight limitations)
Matapeake (MoA)
Chillum (ChA)
Downer (DrA)
Sassafras (SrA)

Class II (moderate limitations)
Mattapex (MrA, MrB)
Hammonton (HaA, HbA, HbB)
Matapeake (MoB)
Chillum (ChB)
Downer (DoB, DrB)
Aura (ArB)
Woodstown (WmB)
Sassafras (SrB)

Class III (severe limitations)
Matapeake (MoC2)
Othello (Ot)
Klej (KmA)
Downer (DoC)
Fallingston (Fd)
Fort Mott (FrA)
Sassafras (SrC2)

Class IV (severe limitations)
none

Impractical / Unsuited for Cultivation

Class V
none

Class VI
none

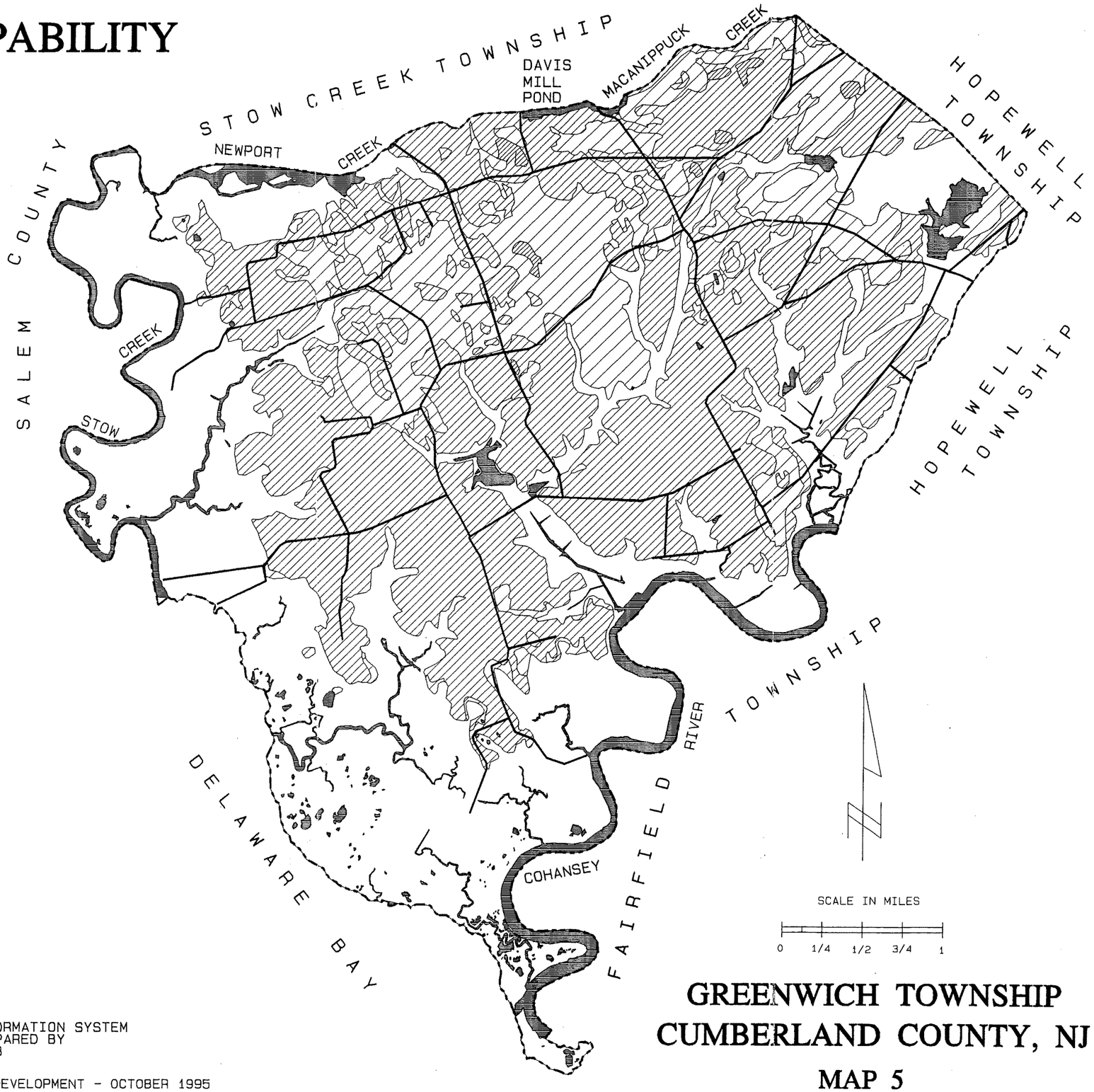
Class VII
Muck (MS)

Class VIII
Tidal Marsh (TM)

AGRICULTURAL CAPABILITY CLASSIFICATIONS

LEGEND

- Class I Soils (slight limitations)
- Class II Soils (moderate limitations)
- Class III & IV Soils (severe limitations)
- Class V Soils and Below (impractical for cultivation)
- Surface Water



GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 5

DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
BASED ON SOIL SURVEY OF CUMBERLAND COUNTY, NJ PREPARED BY
THE U.S.D.A. SOIL CONSERVATION SERVICE, APRIL 1978
PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

Septic Systems Suitability

Septic systems are common means of individual wastewater treatment. However, they work well only when the soils through which their effluent seeps possess the proper texture, slope, depth to seasonal high water table, and percolation rate. Optimum conditions exist when the septic effluent seeps through the soil at a rate which permits soil microorganisms to decompose the wastewater. Too fast a percolation rate increases the likelihood of septic contamination of groundwater. If the rate is too slow, the effluent could back up and eventually rise to the surface. If the groundwater table is too close to the surface, effluent will contaminate the groundwater.

Table 2 lists the major soil types in Greenwich Township, their permeability rates, depth to seasonal high water, and septic limitation rating. Some of the soils listed with a "slight" septic limitation rating suffer from rapid permeability which poses a hazard to groundwater quality.

Map 6 "Septic System Restrictions" and **Map 7 "Seasonal High Water"** are useful for selecting areas for residential development and have major implications for the building densities which the Township should permit. To avoid health hazards and groundwater contamination, development relying on conventional septic systems should be discouraged on soils with severe septic limitations. Development may be permitted in areas with moderate septic limitations if the system is designed and built to accommodate those limitations. Soils with slight septic limitations are the most attractive for development since installation costs will be low and health hazards less likely. However, problems can occur even in soils with slight limitations if residential density is too high.

Map 6 shows that the Township has few areas with only slight limitations for septic systems. The principal constraints in the Township are a seasonally high water table shown on **Map 7** and soils with slow permeability. In addition, soils in the Township's northeastern corner have some slope constraints. The largest contiguous areas having slight limitations are the Fort Mott soils adjacent to the village of Greenwich, the Downer soils along Greenwich Road, and the northwestern portions of the Township on Matapeake soils.

TABLE 2

PERCOLATION RATES AND DEPTH TO SEASONAL HIGH WATER TABLE FOR MAJOR SOIL TYPES in GREENWICH TOWNSHIP

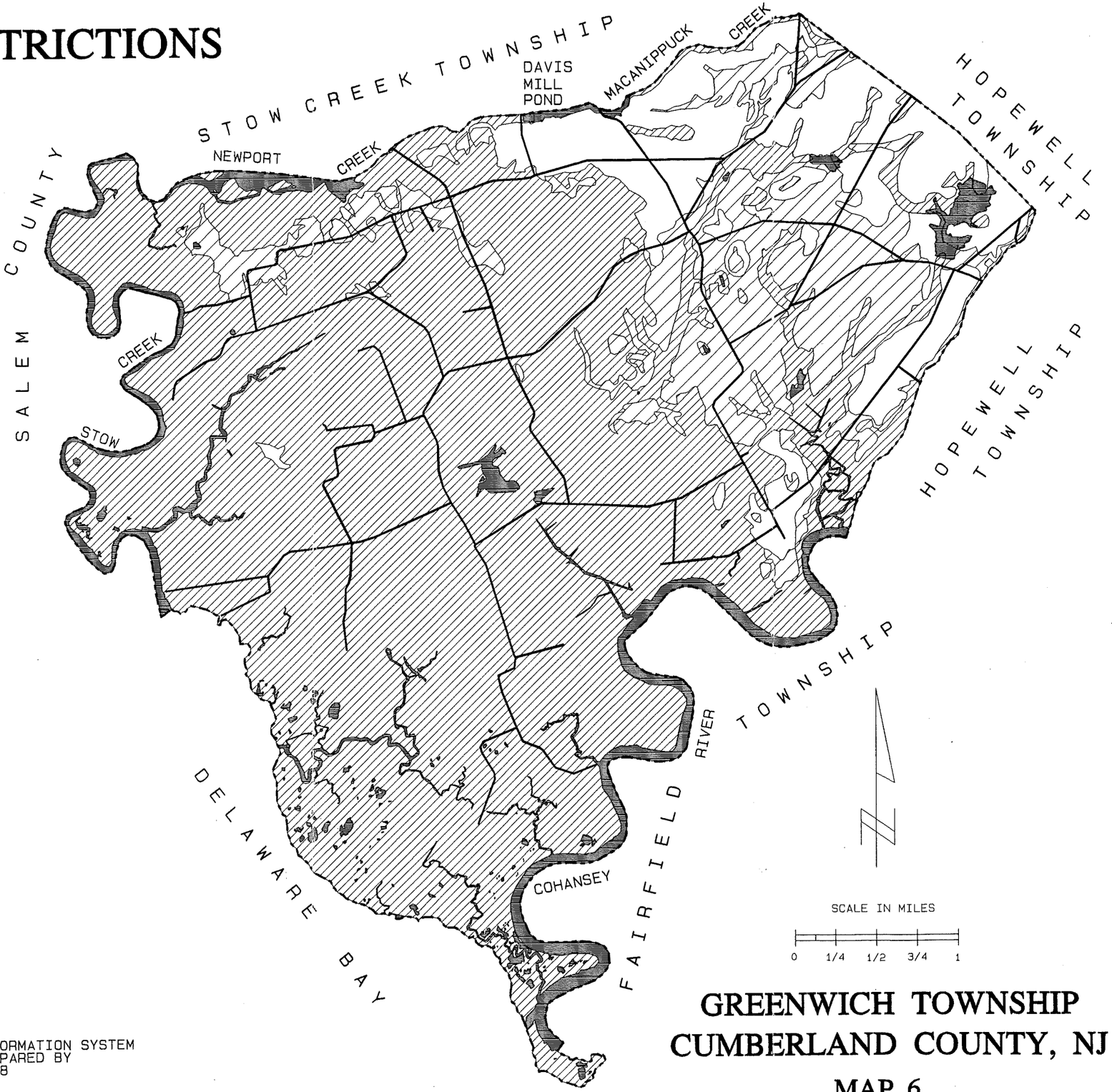
Soil series	Permeability at 2 ft. depth inches/hour	Depth to Seasonal High Water in Feet	Septic limitations
Mattapex	0.2-0.6	2 - 3	Severe
Hammonton	2.0-6.0	1.5 - 4	Moderate
Matapeake	0.2-0.6	5 +	Slight
Othello	0.2-0.6	0 - 1	Severe
Klej	2.0-6.0	1.5 - 4	Moderate
Evesboro	2.0->6.0	5 +	Slight*
Downer	2.0-6.0	4 +	Slight*

* Care should be taken to keep leaching beds sufficiently above the seasonally high water table when laying a septic tank field in Downer, Evesboro, or Fort Mott soils because their rapid permeability could permit pollution of the groundwater.

SEPTIC SYSTEM RESTRICTIONS

LEGEND

- Slight Limitations
- Moderate Limitations
- Severe Limitations
- Surface Water



GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ

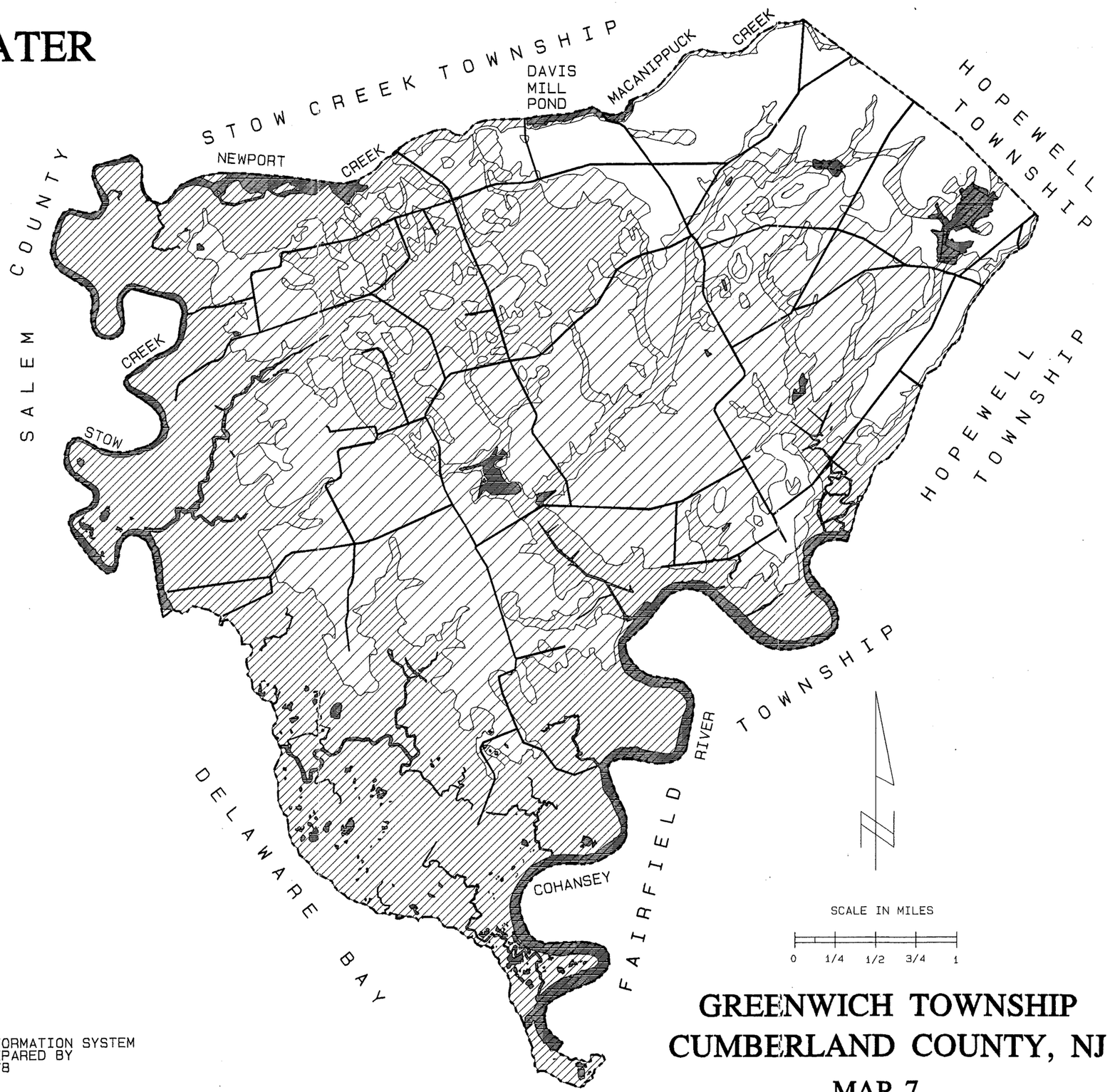
MAP 6

DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
BASED ON SOIL SURVEY OF CUMBERLAND COUNTY, NJ PREPARED BY
THE U.S.D.A. SOIL CONSERVATION SERVICE, APRIL 1978
PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

SEASONAL HIGH WATER

LEGEND

- Surface Water
- 0 - 1 ft.
- 1.5 - 4 ft.
- 4 ft or greater



GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 7

DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
BASED ON SOIL SURVEY OF CUMBERLAND COUNTY, NJ PREPARED BY
THE U.S.D.A. SOIL CONSERVATION SERVICE, APRIL 1978
PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

Soil Series

Soil can be grouped by material and other characteristics into soil series. Fifteen soil series are found in Greenwich Township. The nine most extensive soils are **Mattapex**, **Hammonton**, **Matapeake**, **Othello**, **Klej**, **Evesboro**, **Downer**, **Muck** and **Tidal Marsh** which cover almost the entire Township. This section describes these soil series for location, soil material, drainage, slope, permeability, agriculture class, seasonal high water table, and septic limitations. The soils are presented in decreasing order of their area coverage with the soil survey mapping symbols in parentheses. Other minor soil series found in small areas within the Township are also listed.

Mattapex (MrA, MrB).
location: Extensively in the Township's southern half as a wide terrace area upland from the tidal marsh. Most large farm fields in the southern portion of the Township around Stathems Neck, Greenwich Village and Bacons Neck.

material: silt loam
drainage: moderately well-drained
slope: nearly level or gently sloping
permeability: moderately slow
agriculture capability class: II
depth to seasonal high water table: 2-3'

septic field limitation: The shallow seasonal high water table presents severe limitations to development.

Hammonton (HaA, HbA, HbB).

location: Large areas in the east central portion of the Township. Most of the farm fields between Greenwich village, Othello and Sheppards Millpond. Also small farmed pockets along Raccoon Ditch.

material: sandy loam
slope: nearly level and gently sloping
drainage: moderately-well or somewhat poorly
permeability: moderately rapid
agriculture capability class: II
depth to seasonal high water table: 1'-4'

septic field limitation: Shallow seasonal high water table presents a moderate limitation.

Matapeake (MoA, MoB, MoC2).

location: Continuos areas in the northern portion of the Township. Most of the farm fields north of Othello.

slope: nearly level to sloping
drainage: well-drained
material: silt loam
permeability: moderately slow
agriculture capability class: I, II or III
depth to seasonal high water table: >5'

septic field limitation: slight

Othello (Ot)

location: North central portion of Township in low pockets at the head of intermittent drainage ways. Most of the larger wooded blocks interspersed with nursery fields east of Stathems Neck.

slope: nearly level
drainage: poor
material: silt loam
permeability: moderately slow
agriculture capability class: III
depth to seasonal high water table: 0-1'

septic field limitation: Severe for development in general due to shallow seasonal high water table.

Klej (KmA)

location: Relatively small farmed areas at Springtown and wooded tract west of Pine Mt.

slope: nearly level
drainage: moderately well drained
material: loamy sand
permeability: rapid or moderately rapid
agriculture capability class: III
depth to seasonal high water table: 1.5-4'

septic field limitation: Moderate

Evesboro (EvB, EvC, EvD)

location: Wooded parcels from west side of Sheppards Millpond to Pine Mt.

slope: nearly level to moderately steep
drainage: excessive
material: sand
permeability: rapid
agriculture capability class: VII
depth to seasonal high water table: >5'

septic field limitation: slight

Downer (DoB, DoC, DrA, DrB)

location: Farmed areas along eastern boundary with Hopewell Township between Mill Creek and Mounce Creek.

slope: nearly level to sloping
drainage: well-drained
material: loamy sand
permeability: moderately rapid
agriculture capability class: I, II or III
depth to seasonal high water table: >4'

septic field limitations: slight

The following soils cover minor portions of the Township:

Chillum (ChA, ChB)

Fallingston (Fd)

Aura (ArB)

Fort Mott (FrA)

Woodstown (WmB)

Sassafras (SrA, SrB, SrC2)

The next two items are land types, not true soil series, but cover significant areas in the Township and are listed with the previous soil series in the Soil Survey.

Tidal Marsh (TM)

location: The wide, tidal areas at sea level along the Delaware Bay and lower sections of Stow Creek, Pine Mount Creek and Cohansey River. The most extensive single soil series in Greenwich covering about one-third of the Township.

slope: level
drainage: very poor
material: highly organic
permeability: -
agriculture capability class: VIII
depth to seasonal high water table: 0

septic field limitation: Severe for all development in general.

Tidal marsh is a highly organic, silty and mucky material with a high salt content and flooded by tides twice daily. Tidal marsh should remain in its natural state.

Muck (MS)

location: Low areas along non-tidal streams and creeks throughout the Township. Wooded areas along stream.

slope: nearly level
drainage: saturated
material: organic
permeability: rapid
agriculture capability class: VII
depth to seasonal high water table: 0

septic field limitation: Severe for development in general.

Muck is highly organic soil. The water table is at the surface during the winter and only drops slightly during the summer. This soil is subject to frequent flooding and should remain in its natural state since it has severe limitations for both agriculture and development.

Flood Hazard Areas

Different combinations of rainfall, snow melt, groundwater, soil moisture, and tides can produce a wide range of drainage conditions. When large amounts of rainfall combine with poor soil infiltration, the result can be flooding of areas along rivers and streams. Similarly, large scale storms like "nor'easters" can produce overland flooding of coastal areas. More subtly, when larger than normal rainfall over prolonged periods of time, the groundwater level can rise to the surface and flood areas outside of flood plains. In addition, changes to drainage basins and river channels by human activity can have marked influences on flooding conditions. Changes in land use can also change the amount of runoff from rainfall, producing changes in stream flow. The possibility of these different factors producing flood conditions is known as the Flood Hazard.

National Flood Insurance Program

A federal program has been developed to address the relationship between land use and flood hazard. The National Flood Insurance Program (NFIP), established by Congress in 1968, allows property owners to purchase federally backed flood insurance within communities that participate in the Program. In return for insurance protection, participating communities implement flood plain management measures to reduce flood risks to new development. Through this mechanism, the Federal Emergency Management Agency (FEMA) and participating communities are able to reduce future flood loses.

Under the National Flood Insurance Program, FEMA is required to develop flood risk data for use in both insurance rating and flood plain management. FEMA develops these data through Flood Insurance Studies (FISs). Using the results of this data, FEMA prepares a Flood Insurance Rate Map (FIRM) that depicts the Special Flood Hazard Areas (SFHA) within the study community. SFHAs are areas subject to inundation by a flood having a one percent or greater probability of being equaled or exceeded during any given year. This flood, which is referred to as the 100-year flood (or base flood), is the national standard on which the flood plain management and insurance requirements of the National Flood Insurance Program are based.

Insurance agents and brokers use the FIRM to determine the insurance zones of properties which in turn are used to determine actuarial flood insurance premium rates. Lending institutions and Federal agencies, when they make loans or

provide grants for the acquisition or construction of buildings, use the FIRM to determine if flood insurance is required.

Community officials use the FIRM to administer flood plain management regulations, usually in the form of construction codes and zoning ordinances. Eligibility for the purchase of flood insurance is made available only to those individuals or corporations whose insurable property is located within a community that in agreement with the Federal government, has adopted ordinances to mitigate the impact of future flooding. The most significant of these required ordinances are those which allow issuance of building permits for new residential construction within special flood hazard areas only if the building is constructed with the lowest floor located above the base flood elevation.

While necessary for applying flood plain management requirements and establishing uniform flood insurance rates, the term 100-year flood can be misleading. Although it represents the long term average recurrence interval for a flood of this magnitude, such floods may be experienced in any given year. There have been numerous instances where communities have sustained two, and even three, 100-year or greater floods within a several year period. The 100-year flood might be more properly termed the "1 percent annual chance flood", which represents its true probability of being equaled or exceeded in any year.

Map 8 depicts the FEMA calculation of the 100 year flood hazard areas for Greenwich Township. As shown on the map those areas cover fairly wide areas along Stow Creek, the Delaware Bay and the Cohansey River and also extend up the smaller streams and creeks.

Application in Land Use Planning

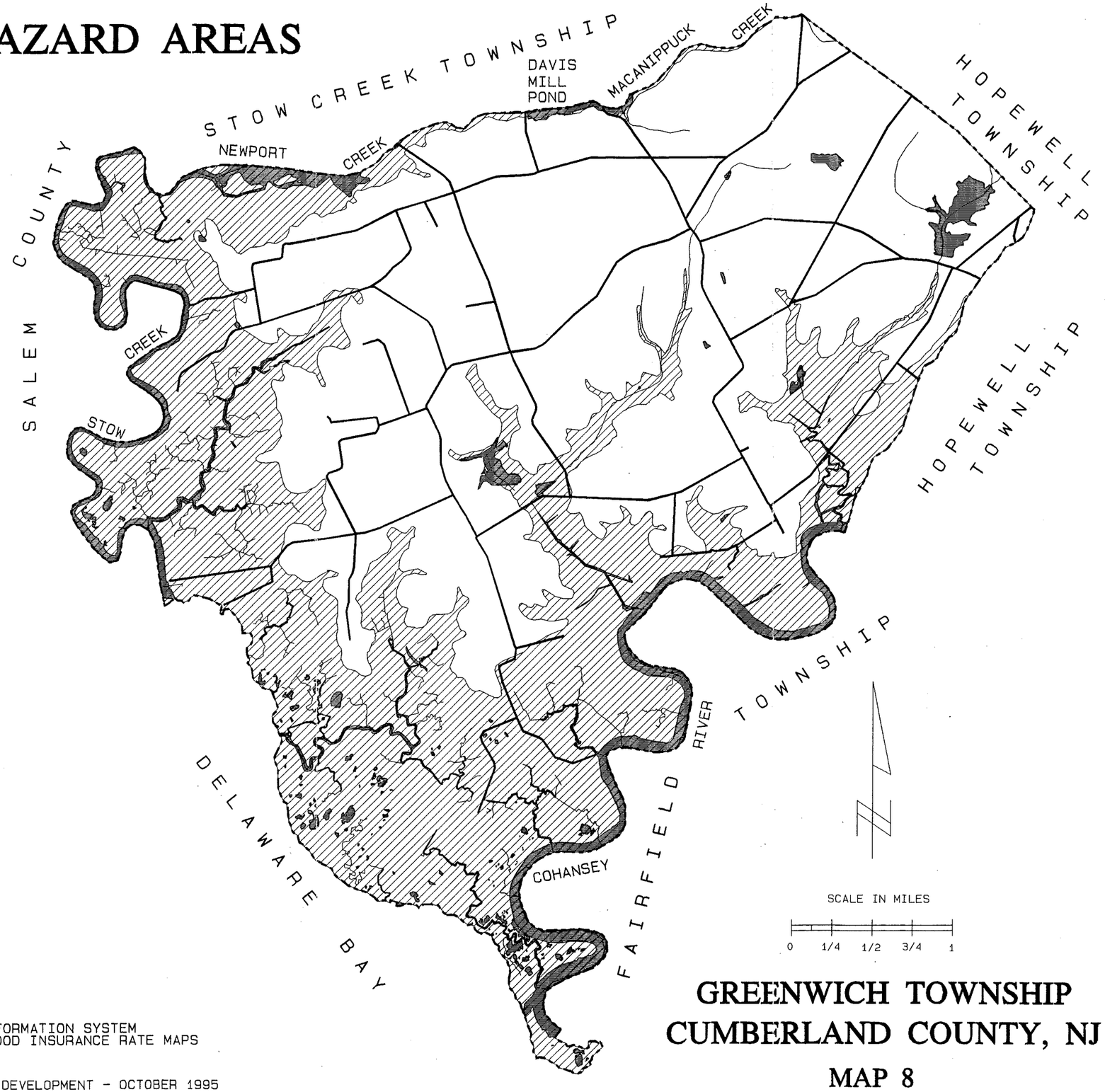
Construction in areas located within the flood hazard area should be managed to minimize flood damage to buildings and life. Improper management of development in these areas can also result in service and infrastructure problems and can aggravate flooding in other portions of the Township. Steps that can minimize problems include requiring structures to be a minimum elevation above a stream or mean high tide, consideration of large building lots, minimizing the amount of impervious surfaces, and minimizing the removal of natural ground cover.

100 YEAR FLOOD HAZARD AREAS

LEGEND

100 Year Flood Hazard Areas

Surface Water



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SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY - FLOOD INSURANCE RATE MAPS
GREENWICH, NJ.
PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 8

Wetlands

Wetlands are known by a variety of names - swamps, marshes, meadows, bogs, fens, sloughs, bottom lands, lowlands, and wet areas. Wetlands generally occur between uplands and open water areas. These areas are important natural resources for a number of functions: fish and wildlife habitat, flood protection, erosion control, recreation and water quality maintenance. Wetlands in New Jersey are also very important in a regulatory sense since State protection of wetlands often exerts influence over the future development of a community.

Wetlands Definition

Wetlands have a very specific definition as provided by the *Federal Manual For Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee For Wetlands Delineation, 1989). This publication, also known as the Federal Wetlands Manual, is the principal document used to define wetlands in most State and Federal programs.

The Federal Wetlands Manual requires an area to possess three basic attributes to be considered a wetland: 1) hydrophytic vegetation; 2) hydric soils; and 3) hydrology. These are briefly described below:

Hydrophytic vegetation

Hydrophytic vegetation is defined as any plant growing in water or in substrate that is at least periodically deficient in oxygen as a result of excessive water content. The U.S. Fish and Wildlife Service's National List of Plant Species That Occur in Wetlands (Reed, 1988a) identifies the "wetland indicator status" of plant species associated with wetlands. Within New Jersey, a local list of wetland indicator plants is also provided. The list classifies vascular plants into four groups based upon the frequency with which a plant species occurs in wetlands. Obligate wetland plants (OBL) almost always occur in wetlands (probability 99%). Facultative wetland plans (FACW) usually occur in wetlands (probability 67-99%). Facultative plants (FAC) are equally likely to occur in wetlands or non wetlands (probability 34-66%). Facultative upland plants (FACU) occasionally are found in wetlands (probability 1-33%). Obligate upland plants almost always occur in uplands.

An area is considered to have hydrophytic vegetation when, under normal circumstances more than fifty percent of the composition of the dominant species from all strata are obligate wetland (OBL), facultative wetland (FACW), and/or facultative (FAC) species.

Hydric Soils

Wetland, or hydric, soils are defined in the Federal Manual as those soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. Those soils designated as very poorly drained or poorly drained by the Soil Conservation Service of the United States Department of Agriculture generally fit this description.

The hydric soil criteria consider soil drainage, soil texture, and water table level. In Greenwich Township, common hydric soils include the following series: Othello, Fallsington, and Hammonton (wet phase).

Hydrology

Wetland hydrology is usually the most difficult of the three technical criteria to establish in the field. An area has wetland hydrology when saturated to the surface or inundated at some point during an average rainfall year. Indicators of wetland hydrology are described in the Federal Manual:

1) visual observation of inundation
2) visual observation of saturation
3) rhizospheres associated with living roots
4) watermarks
5) drift lines
6) water-borne sediment deposits
7) water-stained leaves
8) surface scoured areas
9) wetland drainage patterns
10) morphological plant adaptations, and
11) hydric soil characteristics.

In addition to the above definitions, the State of New Jersey, Department of Environmental Protection has accepted jurisdictional authority for freshwater wetlands under the Freshwater Wetlands Protection Act of 1987 (N.J.A.C. 7:7A). The Act defines wetlands as:

> "An area that is inundated or saturated by ground water 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, soil and vegetation) enumerated in the April 1, 1987 interim-final draft "Wetland Identification and Delineation Manual" developed by the USEPA, and any subsequent amendments thereto."

Farmed Hydric Soil Conditions

These are areas where the vegetative parameter has been altered or is absent, yet the hydric soil criteria is satisfied. Positive hydrologic indicators may or may not be apparent. These areas can continue to be farmed, however, their development potential is severely limited.

State Open Waters

These are specific waters not subject to the jurisdiction of the U.S. Army Corps of Engineers pursuant to Section 404 of the Federal Clean Water Act. State Open Waters may include natural and man-made streams, drainage features (permanent and intermittent), ponds and lakes.

Transition Area

Intermediate zones between wetland areas and uplands provide habitat for plants and animals and incorporate both wet and dry areas. N.J.A.C. 7:7A requires identification of transition areas, based upon the resource value of the wetlands. A standard transition area for wetlands of exceptional resource value is 150 feet and a standard transition area of 50 feet is required for wetlands of intermediate value.

Resource Value

Wetlands are classified into three categories based upon their function with respect to plant and wildlife habitat, ground water recharge, water purification and flood control. Exceptional resource value wetlands provide habitat for state and federally identified threatened and endangered species or discharge into FW-1 (state/federal natural areas) or FW-2 waters (trout production). Ordinary resource value wetlands do not exhibit the characteristics of exceptional resource value wetlands and are isolated wetlands that are not part of a lake or stream system and are more than 50 percent surrounded by development and less than 5,000 sq. ft. in size or are either drainage ditches or swales. Intermediate resource value wetlands are all freshwater wetlands not defined as exceptional or ordinary.

Wetlands Mapping

There are three sources for the identification of wetlands on a community-wide basis. The U.S. Fish and Wildlife Service prepared the National Wetlands Inventory (NWI) maps using aerial photography. This set of maps prepared at a scale of 1:24000, or 1 inch equals 2000 feet, until recently, was the standard source for general wetlands mapping. County Soil Surveys (U.S.D.A., Soil Conservation Service) also provide generalized information regarding the location of wetlands

through the identification of hydric soils and areas with poor drainage. The most recent, and best source of information, are the New Jersey Freshwater Wetlands Maps. The New Jersey Department of Environmental Protection (NJDEP) started mapping wetlands of the State in 1988 at a scale of 1:12,000 (1 inch equals 1000 feet). This scale provides for a greater level of detail than the NWI or Soil Survey maps. In addition, a greater degree of "ground truthing" has been employed in the New Jersey effort.

Though each of the three wetlands mapping sources are very useful for community-wide planning purposes (as explained later in this section), the maps are not accurate enough to address questions regarding wetlands on individual parcels. For this information, an expert in wetlands delineation should be employed to conduct a field analysis.

The Benefits of Wetlands

As mentioned above, wetlands provide a number of benefits to both the human and natural environment. Some of these benefits are as follows:

Water Quality. Wetlands remove sediment, nutrients, pesticide and minerals from surface waters. In some communities, constructed wetlands are actually used to treat sewage Wastewater.

Erosion and Sedimentation. Because wetlands slow the overland flow of water, they reduce soil erosion and sedimentation. Wetlands filter and collect sediment from runoff water, thus helping to reduce mud in streams and lakes. Wetlands also absorb coastal and riverine flood waters thereby reducing soil loss through bank erosion.

Wildlife Habitat. Approximately fifty percent of the federal and state recognized threatened and endangered species either live in wetlands or depend upon wetlands for some aspect of their survival. Numerous other species utilize wetlands for breeding, nesting, and feeding.

Flood Prevention. Wetlands slow down and store flood waters for short periods of time. This storage reduce peak water flow after a storm and helps reduce downstream flooding.

Commercial Fisheries. Many wetlands, especially those located along the coast, provide habitat for an integral part of the life cycle of many commercial finfish and shellfish. Coastal wetlands function as the nursery, food source, and spawning area for a majority of commercial fishes in the United States.

Recreation. Many forms of outdoor recreation benefit from the resources of wetlands. Bird watching, photography, hiking, and many other activities take place in public wetland areas.

Wetlands in Greenwich Township

Greenwich Township's wetlands are generally associated with the major surface water features and the coastline along the Delaware Bay. **Map 9** depicts wetlands in Greenwich Township. The mapping sources for wetlands in Greenwich are a combination of National Wetland Inventory Maps and New Jersey Freshwater Wetland Maps. The NWI maps provide a greater level of detail for the coastal, or estuarine wetlands than the state mapping source.

Wetlands are usually classified into various categories, dependent upon the type of prevalent vegetation, soil and hydrologic factors. This classification system is known as the Cowardin System after the author of the U.S. Fish and Wildlife Service publication Classification of Wetlands and Deep-water Habitats of the United States (Cowardin, et. al., 1977). This system is hierarchical in nature proceeding from general to specific. Wetlands are first classified at a broad level known as the "system". Five systems are defined: Marine, Estuarine, Riverine, Lacustrine, and Palustrine. The vast majority of wetlands in Greenwich fall into the general levels of Estuarine (subtidal - continuously submerged areas; and intertidal - alternately flooded by tides and exposed to air) and the Palustrine (marshes, bogs, swamps and small shallow ponds).

The majority of wetlands associated with Sheppards Mill Pond, Davis Mill Pond, Pine Mount Creek, and other small stream systems are further classified in more detail known as the class level in the Cowardin System. This level describes the general appearance of the wetland habitat in terms of the dominant vegetative life form. These wetlands are known as Palustrine Forested wetlands. These wetlands are dominated by woody vegetation greater than 20 feet tall. Finally, the class of wetland can be further divided into subclasses to define the type of dominant vegetation (e.g. broad-leaved deciduous, needle-leafed deciduous, broad-leaved evergreen, or needle-leave evergreen). The majority of Palustrine Forested wetlands found in these areas are broad-leaved deciduous and needle-leafed evergreen.

Smaller in area and generally associated with small tributaries to the larger streams are Palustrine Emergent wetlands. These are wetlands dominated by erect, rooted

herbaceous hydrophytes. Most of these wetlands fall into the subclass of Persistent.

Somewhat larger in area than the emergent wetlands are Palustrine Scrub/Shrub wetlands. These wetlands are dominated by woody vegetation less than 20 feet tall and are found largely in more disturbed sections of the freshwater wetlands.

The vast majority of wetlands by area in the Township are Estuarine, intertidal, emergent wetlands. These wetlands cover the majority of the southern portion of the township along the Bay as well as the wetlands associated with the Cohansey River. These areas are tidally influenced and contain vegetation characterized by erect, rooted, herbaceous salt water tolerant plants.

Application in Land Use Planning

The state regulations protecting wetlands preempt, or prohibit, municipalities from regulating wetlands directly. This was done to eliminate duplication and conflict between local and state regulation. However wetlands protection still has several applications in local land use planning.

The most obvious application is in designating the location of future land uses. State regulations prohibit the filling or dredging of wetlands, except in special exceptions. These regulations make it nearly impossible to develop housing or other types of land-based development in these areas. It would be inappropriate to direct future land uses to these areas only to have potential builders prohibited by the State from proceeding with their projects.

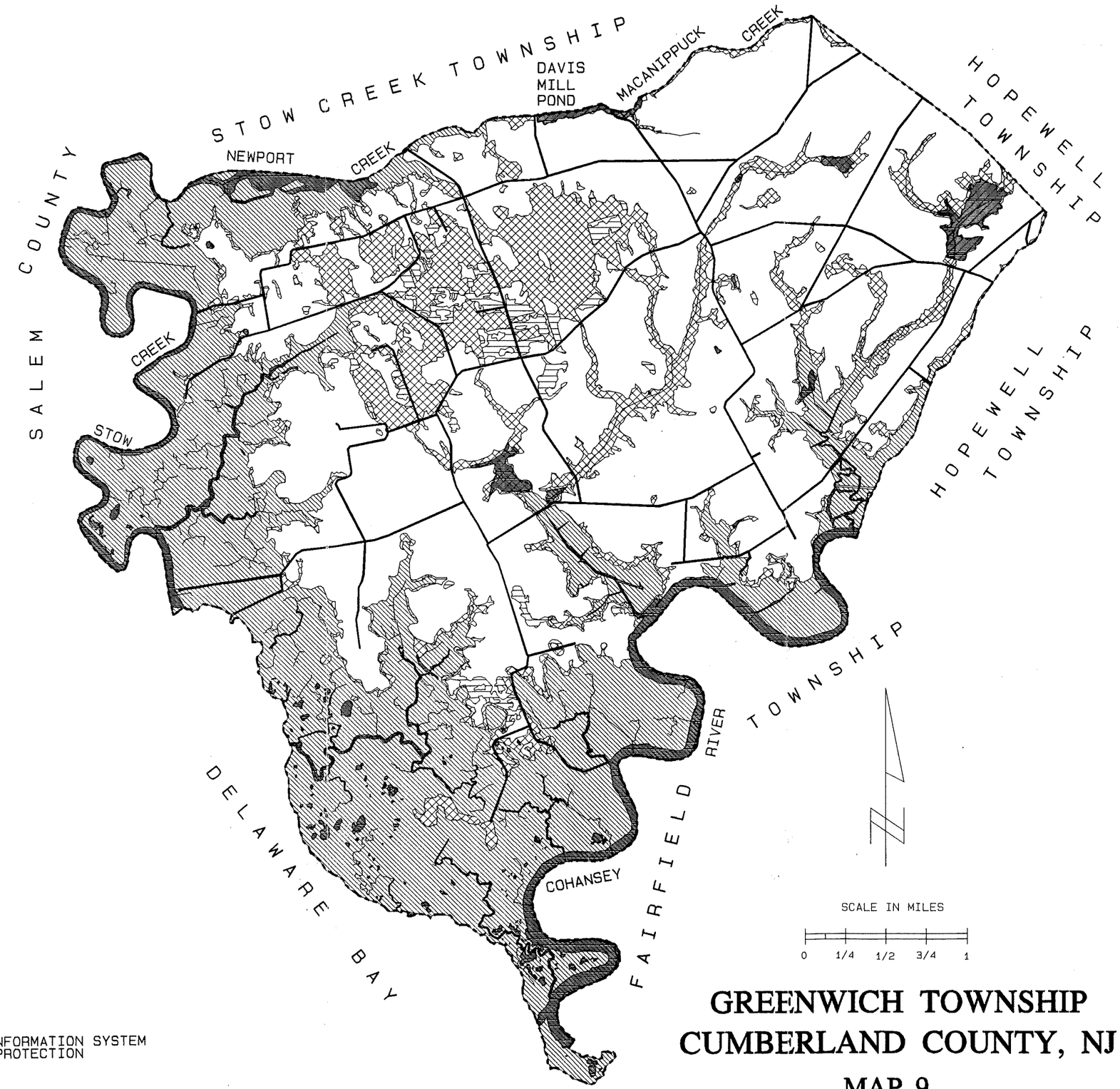
There are also proactive approaches that a municipality can take to protect wetlands. Land use plans for open space and recreation can include wetlands areas for public enjoyment of their natural and aesthetic features, while protecting wetlands from incompatible land uses and development.

Development applications for site plans and subdivisions can be required to include state wetlands permits before the application is deemed complete. This can reduce the expense to the applicant. If the applicant cannot obtain the necessary state permits, the subsequent costs of local and county approvals can be avoided.

WETLANDS

LEGEND

- Estuarine Wetlands
- Lacustrine Wetlands
- Modified Wetlands
- Palustrine Wetlands
- Riverine Wetlands
- Uplands
- Surface Water



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SOURCE: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 9

Vegetation and Wildlife

Vegetation and wildlife habitats are related to the soil and topography, and in Greenwich Township there are **three basic habitat landscapes: open field, woodland and wetland** (**Map 10**). Open field covers most of the upland portion of the Township as active farmland, fallow fields and lawns. Typical vegetative cover in these areas includes crops, grasses and wild herbaceous plants. Open field birds and mammals include quail, pheasants, rabbits, woodchucks, red winged blackbirds, sparrows and crows.

Associated with some open field areas in the Township are hedgerows of naturally occurring trees, shrubs and grasses that have grown along lot lines that have not been mowed for several years. Hedgerows can be found bordering farm fields in the Bayside area.

Woodland occurs in two fragmented patches in the Township: around Sheppards Millpond and between Othello and Stathems Neck. Narrow bands of woodlands also follow nontidal, freshwater stream segments. Oak is the predominate woodland species. Upland varieties of oak include Black, Blackjack, Chestnut, Red, Scarlet, Pots, White and Scrub. Lowland varieties include Bur and Swamp White. Pin Oak and Willow Oak have a wider range growing in both upland and lowland soils. Other woodland species include Sweetgum and the conifer species Pitch Pine and Virginia Pine. Atlantic White Cedar and Holly can be found along streams. Woodlands also contain shrubby undergrowth.

Wildlife found in and around woodland includes ruffed grouse, opossums, raccoons, white tailed deer, red and gray squirrels, gray and red fox, owls and songbirds such as thrushes and vireos.

Wetlands occur in two distinct environments in the Township: wide expanses of saltwater tidal marsh along the Bayshore and Cohansey River, and the thin, linear strands of freshwater wetlands along the stream corridors. Salt hay and cordgrasses predominate in the tidal marsh. The freshwater wetlands contain smartweed, wild rice, wild millet, cordgrass, duckweed and cattail. In areas disrupted or covered by fill material phragmites has crowded out other vegetation. Wetlands wildlife includes muskrats, wood ducks, black ducks and swans.

The following plants, mammals, birds, reptiles and amphibians of special note are identified as being found within Greenwich Township or surrounding areas by the *Cumberland County Estuary Study, Volume 1: Rare, Threatened and Endangered Species Study, and the Birding Guide to Cumberland County, NJ.*

TABLE 3

PLANTS and THEIR HABITATS in GREENWICH TOWNSHIP

Plant	Habitat
Loblolly Pine	moist sandy soil
Evergreen Bayberry	swamps and moist low ground
Basket Oak	damp or wet soil
Mistletoe	on other trees (sour gum, red maple)
Clustered Bluet	wet soil
Cylindrical-headed Bulrush	brackish zones along tidal rivers
Coast Flatsedge	wet soil along coast
Giant Foxtail	coastal salt marsh

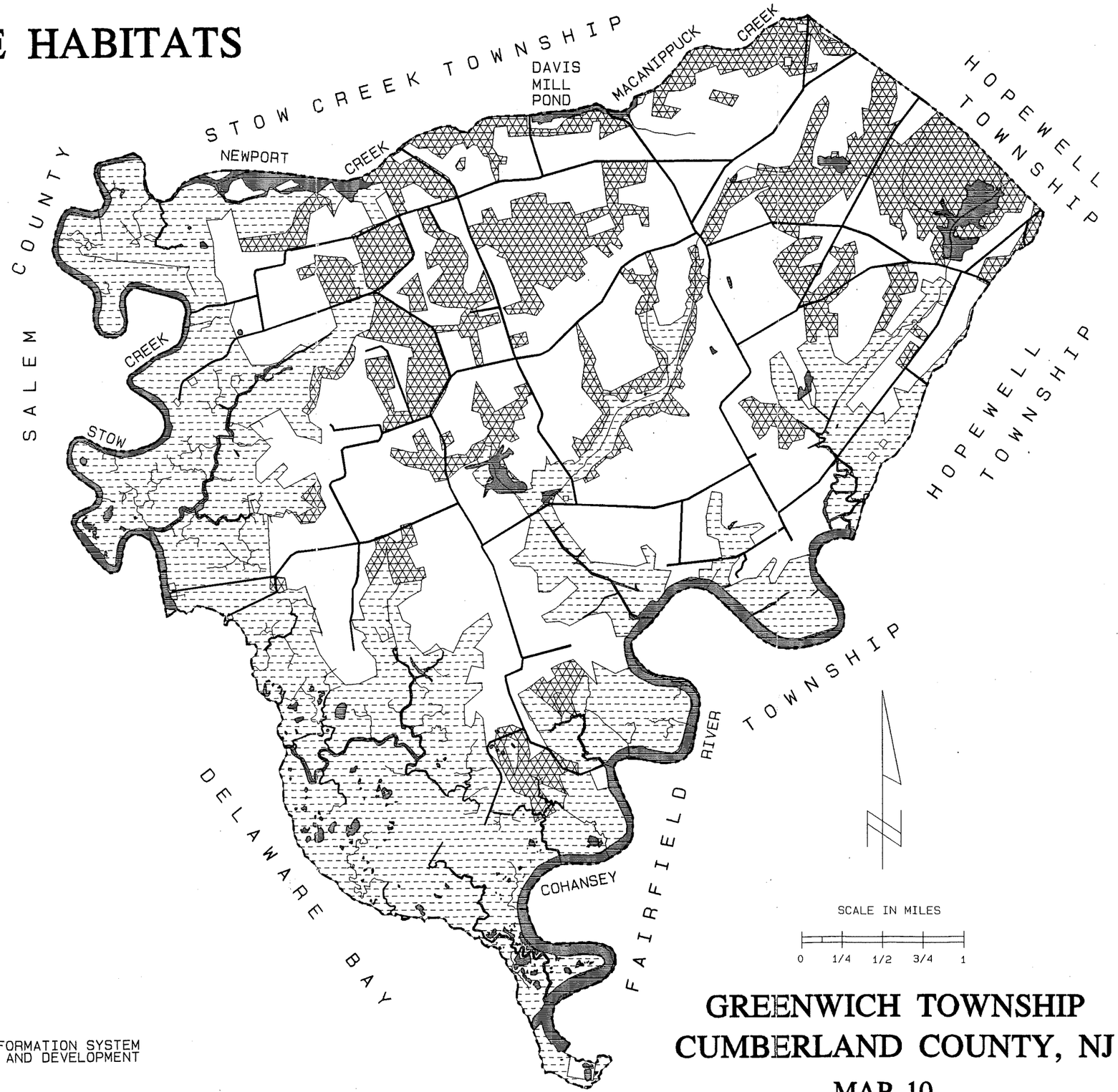
Birds - On a regional scale Greenwich Township is part of the coastal area of Cumberland County located within the Delaware Estuary. The Estuary in general, and Cumberland County specifically, is recognized for its abundance and variety of birdlife. The area supports a combination of breeding, migratory and wintering birds. Bird types include raptors, neotropical songbirds, shore birds and waterfowl species. Of particular importance is the area's unusual concentration of threatened and endangered bird species. Numerous bird species can be found within and around Greenwich Township at varying times throughout the year including Bald Eagles, Snow Geese, Tundra Swans, Northern Harriers, Red-tailed Hawk, Pipits, Horned Larks, Willets, Grasshopper Sparrows, Upland Sandpipers, Egrets, Ringed-Neck Pheasants, Osprey, Bobwhite, Red-throated Loons, Killdeer and Kestrels.

Though less information is available, similar situations also apply to insects, butterflies, moths and dragon flies.

MAJOR VEGETATIVE HABITATS

LEGEND

- Open Field Habitats
- Woodland Habitats
- Wetland Habitats
- Surface Water



GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ

MAP 10

DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
SOURCE: CUMBERLAND COUNTY DEPARTMENT OF PLANNING AND DEVELOPMENT

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Mammals - The following species were observed within the Township by the Delaware Estuary Rare, Threatened and Endangered Species Study but are considered abundant. No endangered mammals are known to occur within Greenwich Township.

TABLE 4

COMMON MAMMALS IN GREENWICH TOWNSHIP

Opossum	Big Brown Bat	Gray Squirrel	Long-tailed Shrew
Red Fox	Brown Myotis (bat)	Eastern Mole	White-footed Mouse
Raccoon	Chipmunk	Meadow Vole	Cottontail Rabbit
Skunk	Woodchuck	House Mouse	White-tailed Deer

Reptiles and Amphibians - The following turtle, snake, toad, frog and salamander species were observed within the Township by the Delaware Estuary Rare, Threatened and Endangered Species Study. None are considered threaten or endangered; all have stable populations in New Jersey except for the Diamondback Turtle which is declining.

TABLE 5

REPTILES and AMPHIBIANS IN GREENWICH TOWNSHIP

Snakes	Turtles	Frogs and Toads
Water	Snapping	Spotted Leopard
Southern Ringneck	Mud	Green
Black Racer	Box	Northern Gray Treefrog
Black Rat	Diamondback	Bullfrog
	Red-bellied	Spring Peeper
	Painted	Fowlers Toad
Salamanders		
Red-backed		

Geology and Ground Water

Several geologic layers or formations underlie or are exposed at the surface in Greenwich Township. Two of these layers are aquifers through which water moves freely and can be withdrawn in usable amounts. For its drinking water, Greenwich relies upon groundwater from individual wells that tap these aquifers. Geology controls how these layers perform as water supplies and how susceptible they are to contamination. Most wells in the County obtain water from depths between 0 and 180 feet. Records indicate that wells in Greenwich tap the Kirkwood - Cohansey and the Cape May or Kirkwood Formations for their water.

Coastal Plain Geology

From a geologic viewpoint Greenwich Township is situated on the geologic province of the Atlantic Coastal Plain , a thick wedge of sediments dipping seaward that extends along the coast of eastern United States from Long Island, N.Y. to Texas. On a more regional scale the Coastal Plain underlies southern New Jersey including Cumberland, Salem, Cape May, Atlantic, Camden, Gloucester, Burlington, Ocean, Monmouth, and parts of Mercer and Middlesex Counties.

The Coastal Plain geology consists of sand, silt, clay and gravel sediments deposited in layers by a series of advancing and retreating seas beginning roughly 135 million years ago (Cretaceous Period of the Mesozoic Era). These layers were formed during three geologic periods: the Cretaceous (135 million to 65 million years ago) of the Mesozoic Era, and the Tertiary (65 million to 1.5 million years ago) and Quaternary (1.75 million years to present) of the Cenozoic Era.

Geologic Formations

Beneath Greenwich Township the Coastal Plain sediments extend to a depth of 2,500 to 3,000 feet beneath the surface. Below that depth is bedrock. The layers tend to become thicker and deeper to the southeast. **Table 6** presents the major geologic layers found beneath the Township.

Much of the information in this section on the depth and thickness of the geologic units is derived from a series of *U.S. Geological Survey Open File Reports* produced as part of their studies on the Atlantic Coastal Plain aquifer system

The oldest formation at the bottom of Coastal Plain, resting on bedrock, is the **Potomac-Raritan-Magothy group** (P-R-M). It major aquifer system in the Camden area where its has been

severely stressed by heavy usage. As a result it is designated as a critical water supply area by NJDEP and withdrawals from this aquifer are strictly regulated. However, in Cumberland County it is too deep and the water is too saline for practical use.

Above the P-R-M group is the **Merchantville-Woodbury unit.** It is not considered an aquifer. It is less than 150 feet thick and occurs at depths roughly between 600 to 800 beneath Greenwich Township. It has a high clay content and acts as a confining layer on top of the P-R-M.

TABLE 6

GENERALIZED GEOLOGIC SECTION OF GREENWICH TOWNSHIP, NJ

Geologic Unit	Depth "	Thickness "	Comments
Kirkwood - Cohansey	at surface	50	primary aquifer in region, clay layer from 50 to 125' depth ?
Piney Point	125 - 175	100 - 140	aquifer - some wells in Greenwich may be tapping
Navesink - Hornerstown	100 - 150	400 - 500	confining unit
Wenonah - Mount Laurel	500 - 650	90	saline beneath Cumberland County
Merchantville - Woodbury	600 - 800	<150	confining unit
Potomac-Raritan-Magothy	700 - 800	2,000	saline beneath Cumberland County
Bedrock	2,500 - 3,000	?	

The next layer is the **Wenonah-Mount Laurel aquifer** which occurs at a depth of about 500 to 650 feet beneath the surface and extends downward with a thickness of about 90 feet. It has a chloride content above the state standard of 250 milligram for drinking water in most of Cumberland County though wells in southern Salem County and northern Burlington County produce freshwater.

Overlying the Wenonah-Mount Laurel aquifer is a confining bed of silty and clayey sands that includes the **Navesink Formation** and **Hornerstown Sand** among others. This bed is 400 to 500 feet thick, occurs at depths of 100 to 150 feet, and has low to moderate permeability. It is generally not considered an aquifer, however is does contain the **Piney Point Formation** which is an aquifer in southern New Jersey.

The **Piney Point aquifer** occurs at a depth of 125 to 175 feet beneath Greenwich Township and is 100 to 140 feet thick. It may become an increasingly more important water supply.

The uppermost formation which outcrops at the surface is the **Kirkwood-Cohansey aquifer** which also includes overlying deposits of the Beacon Hill Gravel, Bridgeton Formation and Cape May Formation. It is about 50 feet thick in Greenwich Township and is a water table aquifer. It is a regional extensive aquifer system that underlies an area of about 3,000 square miles over southern New Jersey and estimated to contain 17 trillion gallons of water. Because it is sandy and at the surface it is very vulnerable to contamination. **Map 11 "Generalized Geology"** shows the outcroppings of the Cohansey and Kirkwood Sands within the Township.

Water Quality and Pollution of Groundwater

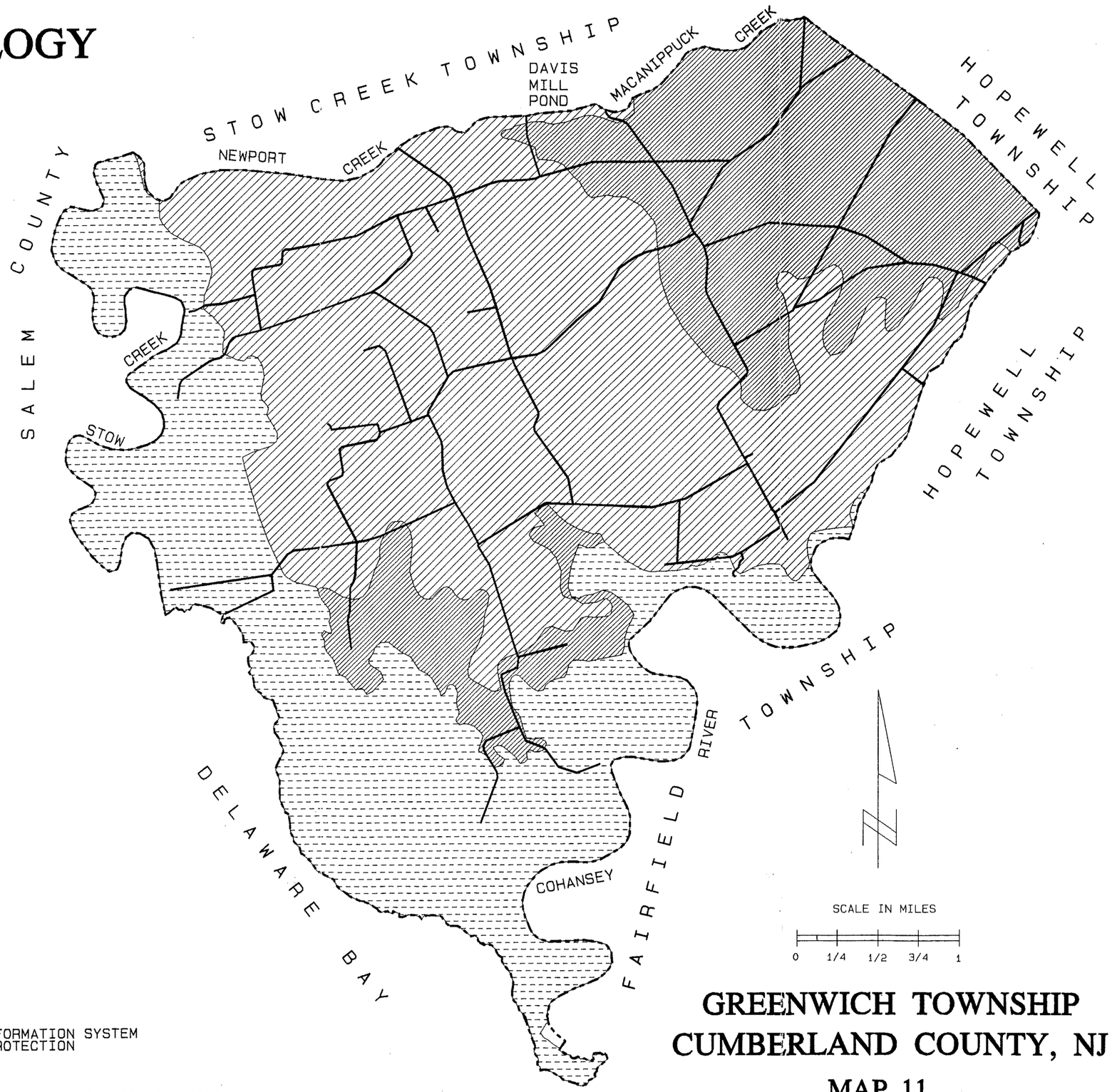
The quality of groundwater in Cumberland County depends mainly upon its depth below the surface and its specific location within the County. The poor quality water tends to be salty and occurs in three principal zones throughout the County:

- At depths usually less than 100 feet along the Delaware Bay's tidal flats and tributary estuaries;
- At deeper depths from below 200 feet at Greenwich to approximately 750 feet below Bridgeton and Port Norris; and
- At depths greater than 1,000 feet throughout the County.

GENERALIZED GEOLOGY

LEGEND

- Quaternary Marshland (Qm)
- Tertiary Cohansey Sand (Tch)
- Tertiary Kirkwood Sand (Tkw)



DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
SOURCE: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
NEW JERSEY GEOLOGIC SURVEY

PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 11

There are potential problems associated with groundwater supply. These include saltwater intrusion, protection of recharge areas, and contamination.

The possibility of saltwater intruding into a fresh water aquifer and its wells is a concern to the Township. Saltwater intrusion is a threat to shallow aquifers along the Delaware Bay and the tidal reaches of most streams. Intrusion occurs where the freshwater head is lowered relative to the saltwater head, thereby permitting the movement of saltwater into a part of the aquifer which was formerly fresh water. This condition can result when well pumping exceeds recharge rates and draws saltwater into the aquifer. Because greater volumes of groundwater are used in summer than in winter, water quality in many shallow wells near the tidal portions of the Cohansey and Maurice Rivers could deteriorate seasonally.

Aquifers rely upon natural precipitation at their outcrop for recharge areas on the surface. Water may also leak into it from another formation. The outcrops in Greenwich are recharge areas for the Township's water supply. When recharge areas are covered by impervious surface such as parking lots, roads, and intensive development, water infiltrating into the ground may be reduced in both quantity and quality. The use of onsite recharge basins, permeable paving, and other techniques that facilitate infiltration into the ground can be used to reduce losses to the aquifer.

Ground water is subject to pollution from a number of sources, including:

Septic tanks, cesspools, and leaky sewer pipes: When these are placed below or near the water table, sewage effluent may contaminate groundwater.

Agricultural activity: Livestock feedlots, fertilizer and pesticides may add nutrients and chemicals to the groundwater, particularly in areas having high water tables and very permeable soils.

Landfills:. The leachate from landfills can enter the water table and contaminate the water supply.

Chemical spills:. Spills and leaks from manufacturing activities and while transporting materials may enter the groundwater supply.

Deicing salts: The heavy use of salt on roads to combat icy conditions can result in the salt pollution of groundwater.

Estimates of Groundwater Reserves

An assessment of the Township's water yield must consider the impacts of withdrawals from low lying areas along Delaware Bay. Since pumping water in that vicinity could lead to saltwater intrusion, the most suitable areas for developing Greenwich's water supply occur topographically twenty feet or more above sea level.

In the 1970's the New Jersey Bureau of Geology estimated an available water supply of 750,000 gallons per day per square mile. This would apply to the area east of Ye Greate Street where most of the high ground is located. Since the total area there is approximately four square miles, an estimated 3 million gallons per day is available for use. This is consistent with estimates derived from the Statewide Water Supply Plan, 1994, by the N.J. Department of Environmental Protection which assumed only 10 % of the total precipitation is available for use in the coastal areas because of concerns about saltwater intrusion. While water is available at lower elevations, the safe yield diminishes as one approaches the Bay and the hazards of salt water intrusion increase.

Estimates of Water Use

A knowledge of water use is important to ensure that demand does not exceed the supply. Information on water use within the Township is very sketchy because few water use records are available and water is obtained individually on-site for every property. However based on land use and population information, rough estimates can be made of water use.

There are two significant types of water users in the Township: residential population and agricultural irrigation. Commercial and industrial uses appear to be negligible.

Agricultural water use for irrigation is difficult to determine because it is seasonal and depends on the weather, crop type, acres cultivated and farm management practices. Because these factors vary, certain assumptions have to be made first:

- half of Greenwich Township's 4,385 acres of farmland are irrigated = 2,192 acres;
- irrigated farmland uses 7,000 gallons/acre/day at peak irrigation rates;
- irrigation is used an average of 1 day per week during June, July and August (average of 13 days per summer) .

Based on these assumptions a *rough estimate* of **agricultural irrigation** water use is made as follows:

- **2192** acres * **7,000** gal/acre/day = **15.3** million gal/day (mgd);
- **15.3** mgd * **13** irrigation days/yr. = **198.9** million gal/yr.

  = **0.5** mgd average on a yearly basis at *peak rates*.

Residential water use is generally considered to average about 100 gallons per day per person. Therefor, the Township's population of 911 people can be estimated to use 91,100 gallons per day:

- **911** people * **100** gallons/day = **91,100** gallons/day.

On a yearly basis, **total daily average water usage** within the Township is *roughly:*

- **0.5 mgd agriculture + .09 mgd residential = 0.59 mgd total.**

A daily average water usage of **0.59 mgd** is well below the estimated available water supply of 3 mgd. However, the peak irrigation rate of 15.3 mgd, though short in duration might present problems of saltwater intrusion if those groundwater withdrawals are concentrated along the Bay and tidal areas.

Land Use, Transportation and Economic Activities

Analyzing land use, transportation and economic activities is important for understanding how the community functions and makes use of its natural resources.

Existing Land Use

An inventory of land uses can be valuable to a Planning Board in a number of ways. By comparing land use statistics from earlier time periods, development trends and changes in the Township's landscape can be estimated. An accurate land use map can reveal the relationship between human use of the land and various environmental factors. Existing land use statistics may also be used in determining the need for infrastructure and to prepare population projections. Other types of activities such as the production of zoning maps and economic development plans can also use land use statistics.

There are standardized categories for land use. Land use studies in Greenwich have utilized the following system:

Residential. This category includes single family, two-family, farm houses, rural development, hotels, motels, trailers, apartments, and other multi-family housing units.

Commercial-Service-Wholesale. This category includes all retail and wholesale stores, warehouses, offices (both professional and business), and commercial recreation.

Agricultural. All types of agricultural land uses including nurseries and non-residential farm buildings, fields, and irrigation ponds.

Industrial. Industries, processing facilities, any type of assembly or manufacturing facilities, railroad rights-of-way, truck terminals, utility structures, and radio towers.

Public and Quasi-Public. This classification includes land used for schools, police, fire and emergency squads, municipal buildings and playgrounds. All State, County and municipal institutional uses are included in this grouping. Quasi-Public uses include churches, private clubs, private schools, and prisons.

Open Space. This category includes state-owned wildlife management areas, municipal parks, and other areas dedicated to open space preservation.

Woodland. Privately owned wooded open space. Excludes public open space. Wooded areas of agricultural lots are included in this category.

Wetland. This category is a generalized representation of marshes, meadows, tidal flats, creeks, rivers and lakes with a minimum size of 40 acres. Excludes public open space. This category represents only a generalization of wetland areas and does not provide the level of information presented in more detailed discussions of wetlands.

Vacant (Miscellaneous). Privately owned, unused, undeveloped land that does not fit into any other categories. An example would be a cleared lot that has no improvements and does not contain any of the above environmental characteristics.

Aerial photography and tax maps were used to record land uses on a base map. The map was then field checked by planners through the use of a "windshield" survey. The subsequent information was then digitized using the County Geographic Information System. **Table 7** presents the land use statistics compiled for 1995, and **Map 12** is a map of the 1995 existing land use.

TABLE 7

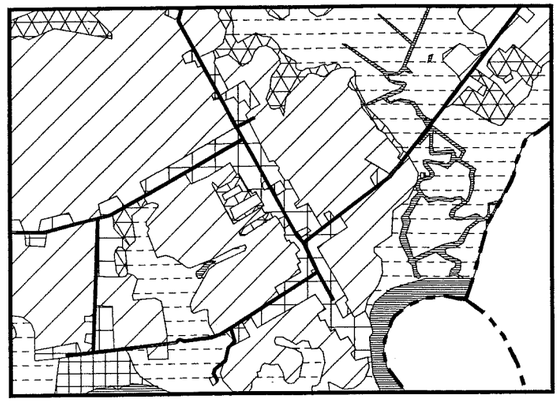
EXISTING LAND USE DATA 1995

Type of Use	Area In Acres
Residential	250
Commercial	20
Public/Quasi Public/Open Space**	210
Agriculture	4350
Woodland	2330
Wetland	4030
Misc. Vacant	25

Based on 1987 aerial photography, tax maps, and 1993 and 1995 field surveys.

** Includes State-owned open space, local parks, and Holly Shores Girl Scout facility at Sheppards Mill.

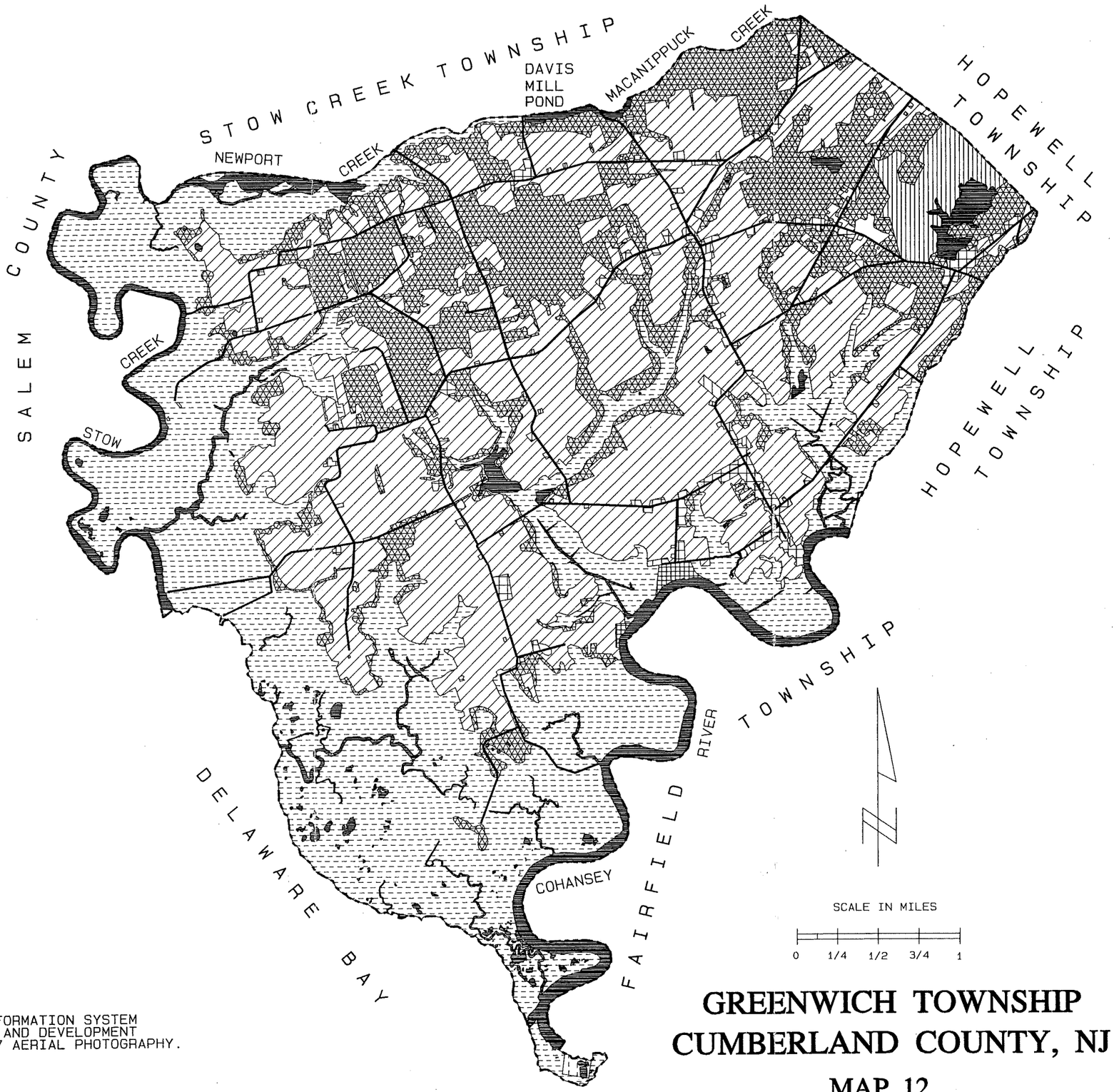
EXISTING LANDUSE



GREENWICH VILLAGE

LEGEND

- Agriculture
- Commercial
- Low Density Residential
- Parks and Playgrounds
- Public Land
- Quasipublic land
- State Owned Open Space
- Woodland
- Wetlands
- Water
- Vacant and Miscellaneous Land



DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
SOURCE: CUMBERLAND COUNTY DEPARTMENT OF PLANNING AND DEVELOPMENT
BASED ON GREENWICH TWP. TAX MAPS AND 1987 AERIAL PHOTOGRAPHY.
FIELD CHECKED 1993 / 1995

PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - NOVEMBER 1995

GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 12

Based upon the above statistics, approximately five hundred acres of the Township are in some way developed for residential, commercial, or public/quasi public use. The majority of development concentrates around Greenwich village, Springtown, and Othello. A large percentage of the Township is used for agricultural purposes throughout the Township. The largest tracts of woodland occur in the northeastern and north central areas of the Township.

Comparison With Earlier Land Use Studies

The overall pattern of land use in Greenwich Township has changed very little over the past thirty years. **Table 8** lists selected land use acreage from studies conducted in 1964 and 1974 as provided in the previous Master Plan, and in 1995 for this Master Plan. Because of differences in the studies, a direct comparison of land use acreage can not be made between the studies. The variation in land use acreage from 1964 to 1974 and 1995 are due more to differences in study methods than physical changes in land use. The 1974 study relied on tax maps which increased the count of residential and agricultural acreage. The other studies relied primarily on aerial photography.

TABLE 8

LAND USE STUDIES FOR 1964, 1974 and 1995

Type of Use	1964	1974	1994
Residential	199.1	339.3	250
Commercial	14.0	10.0	20
Industrial	17.6	11.2	0
Agriculture	4698.3	4950.9	4350
Woodland	2115.4	1733.5	2330
Wetland	4614.3	4141.5	4030

Overall there have been no significant changes in the land use for the time period listed above and only a few subtle trends. Residential acreage appears to have increased slightly and agricultural acreage appears to have declined slightly. Commercial acreage remains small and industrial land use has disappeared.

The land use patterns in Greenwich Township have shown very little change over recent history. Additional acreage devoted to residential uses has occurred on a modest scale. The overall pattern of developed land use has not changed

significantly, with most development taking place around the existing development centers. Greenwich Township remains a largely rural community with large areas of wetlands, woodlands, and agricultural lands surrounding the three small communities of Greenwich village, Othello and Springtown. No significant changes in land use are foreseen, conditioned upon 1) no increase in growth pressures and 2) no plans for infrastructure.

Community Facilities and Services

Community and recreational facilities and services are limited but available to the Township's residents. The Township's administrative office is housed in a single story frame structure located on Ye Great Street. Across the street is the fire hall for the Greenwich volunteer fire and rescue squad. The Morris Goodwin School has tennis courts and play fields. The Township owns a one acre recreation field located in Springtown. Swimming is provided at Sheppards Millpond during the summer. A scenic lookout tower is located along the Delaware Bay on the Public Service Electric and Gas (PSE&G) property at Bayside. Two museums, the Cumberland County Historical Society in the Gibbon House and the John DuBois Maritime Museum, are located on Ye Great Street. Access to the Cohansey River is provided by three privately owned marinas.

Solid waste disposal and recycling is conducted as part of the Cumberland County Improvement Authority's county-wide program. Greenwich Township residents use the Hopewell convenience center under an agreement with Hopewell Township. There is no municipal pick-up, disposal site or drop-off center within Greenwich Township. In 1994 about 75 tons of recyclable material and over 500 tons of sold waste were accounted to the Township.

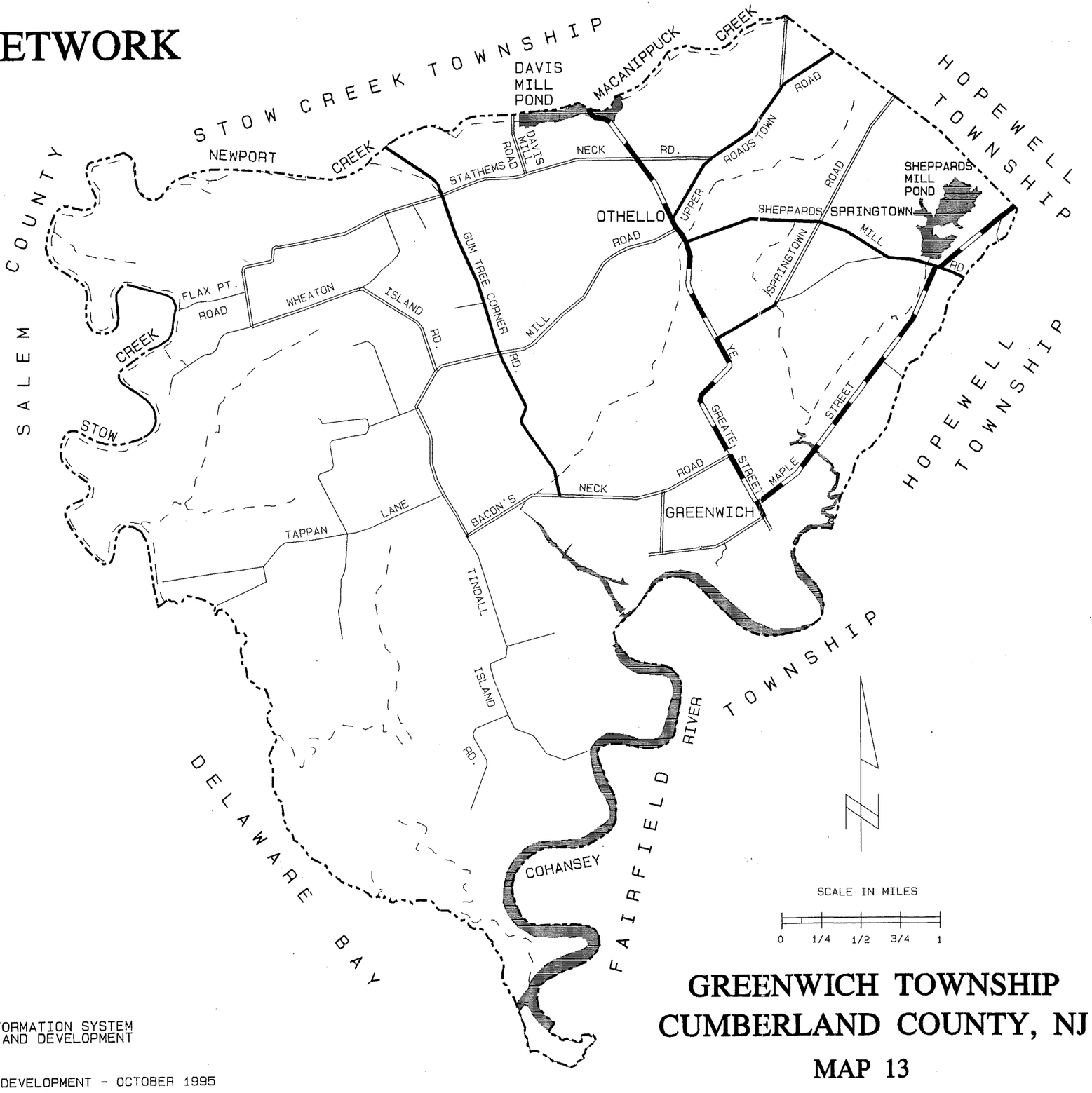
Transportation

Transportation and community facilities within Greenwich Township are consistent with the population and land use setting. Transportation in Greenwich Township relies almost exclusively on the automobile and a rural road network. There are a total of 35 miles of roadways: 11 miles municipal-owned and 24 miles county-owned. All the roads are two lanes with light traffic volumes and more than adequate capacity. **Table 9** shows their mileage and functional classifications, and **Map 13** shows the road network.

TRANSPORTATION NETWORK

LEGEND

- County Minor Arterial
- County Major Collector
- County Minor Collector
- Local Roads
- Streams



GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 13

DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
SOURCE: CUMBERLAND COUNTY DEPARTMENT OF PLANNING AND DEVELOPMENT

PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

TABLE 9

ROAD MILEAGE and CLASSIFICATION in GREENWICH TOWNSHIP

Classification	Mileage
County arterial	5
collector	19
Local	11
TOTAL	35

The major roadways within the Township are 5 miles of county-owned arterials, consisting of two roads (Route 607 and Route 623) which indirectly connect Greenwich village with Bridgeton and Salem, respectively. Most of the road mileage (19 miles) in the Township is county-owned arterial, providing circulation within the Township and leading into the surrounding Townships of Stow Creek and Hopewell. Most of the local road mileage leads from collectors to the Delaware Bay such as at Bayside or to the Cohansey River.

Public transportation and mass transit are not available and does not pass through the Township due to the Township's low population density and its isolation away from regional transportation routes. The closest public transportation is the NJ Transit bus stop in Bridgeton.

The light traffic volumes make the roadways attractive for bicycle and pedestrian traffic. The primary concern is there are no shoulders along most roadways to separate bicyclists and walkers from the travel lanes of high speed rural traffic. Shoulders are preferable to sidewalks because of the light traffic volumes and rural nature of the Township .

Another transportation feature that warrants special mention is the Intracoastal Waterway which passes by Township's shoreline up the Delaware Bay to the Delaware Canal. The marinas located on the Cohansey River make the Township accessible by boat from any port in the world. However, boat traffic using the marinas and the Cohansey River is predominantly local, consisting of recreational boaters and commercial fisherman.

For air transportation the closest regional airport is the Millville Municipal Airport. The closest international airports are the Philadelphia International Airport and Atlantic City International Airport.

Economic Activities

The primary economic activities of the Township are based on the soil, the Cohansey River and the Delaware Bay. Greenwich Township has primarily an agricultural economy. While economic data at the municipal level is not available from the 1990 U.S. Census, inferences can be made from county level data. Countywide, there are 68,627 acres of farmland and the market value of agricultural products sold is $ 73 million, giving a countywide average market value of $ 1,064 in agricultural products sold per acre of farmland. Applying this figure to the 4,385 acres of farmland identified in the Land Use Section of this Township Master Plan gives an estimated market value of almost $ 5 million for agricultural products grown annually in Greenwich.

Commercial and retail activity is quite small, consisting of three marinas and boat yards, two restaurants and an antique shop. That essentially covers all the retail activity in the Township. Combined the marinas have several hundred boat slips for seasonal rentals and two boat ramps for daily use by trailered boats. The restaurants also have several temporary docking facilities for boats. Commercial crabbing and fishing takes place in the river and bay. In addition, there are a few home-based professional offices and other part-time home occupations in the Township. The only general store in Greenwich has undergone a series of openings and closings. There is no industrial activity within the Township.

Population, Employment and Housing

This section presents general information taken from the 1990 U.S. Census of Population and Housing for Greenwich Township.

General Population Characteristics

Consider the Census a snapshot. Like a photograph taken with a camera, the Census provides a picture of a community at a given point in time. The 1990 Census of Greenwich Township's population recorded 911 people, the least number of Township residents in this century.

TABLE 10

GREENWICH TOWNSHIP POPULATION 1900 - 1990

Year	Population
1900	1283
1910	1145
1920	966
1930	979
1940	929
1950	966
1960	1086
1970	963
1980	973
1990	911

Race, Age and Mobility

Most residents are of white racial and ethnic background. The median age is 38.8 years, the highest median age of any municipality in Cumberland County. Almost 75 % of the total population were born in New Jersey; 1 % were foreign born. Of the population aged five years and older, 75 % lived in the same house from 1985 to 1990, compared to 61 % county and statewide.

TABLE 11

RACIAL AND ETHNIC COMPOSITION IN 1990

Racial/Ethnic Identification	# Residents
White	768
Black	98
American Indian, Eskimo, or Aleut	41
Asian or Pacific Islander	3
Other Race	1
TOTAL	911

Education and Income

The majority of Greenwich Township adults aged 25 years and older had a high school education, 74 %, compared to 63 % countywide, 77 % statewide and 75 % for the nation. A Bachelor's Degree or higher is held by 19 %, compared to 11 % countywide, 25 % statewide and 20 nationwide.

Average family income was $35,083 in 1989, placing the Township. somewhere in the middle of Cumberland County municipalities and slightly higher than the County average. The percentage of families below the 1989 poverty line was 6.9. **Table 12** compares education and median family income levels in Greenwich to the other municipalities in the County, to New Jersey and to the United States. Total household income in the Township is about $ 8 million.

TABLE 12

EDUCATION AND INCOME LEVELS FOR GREENWICH TOWNSHIP AND OTHER CUMBERLAND COUNTY COMMUNITIES

	H.S. Grads	B.S. or higher	Median Family Income
GREENWICH	74 %	19 %	$35,083
CUMBERLAND	63	11	$34,571
NEW JERSEY	76	25	$47,589
UNITED STATES	75	20	$34,213

TABLE 13

INCOME AND POVERTY RATE

	Per Capita Income	Median Family Income	Poverty Rate of Families
GREENWICH	$ 13,580	$ 35,083	6.9 %
CUMBERLAND	12,560	34,571	10.2
NEW JERSEY	18,714	47,589	5.6

As **Table 13** shows the average income levels for Greenwich Township residents are slightly above the county average but less than the statewide average. Similarly the Township's poverty rate is lower than the county-wide rate but higher than the state-wide rate.

Population Density and Distribution

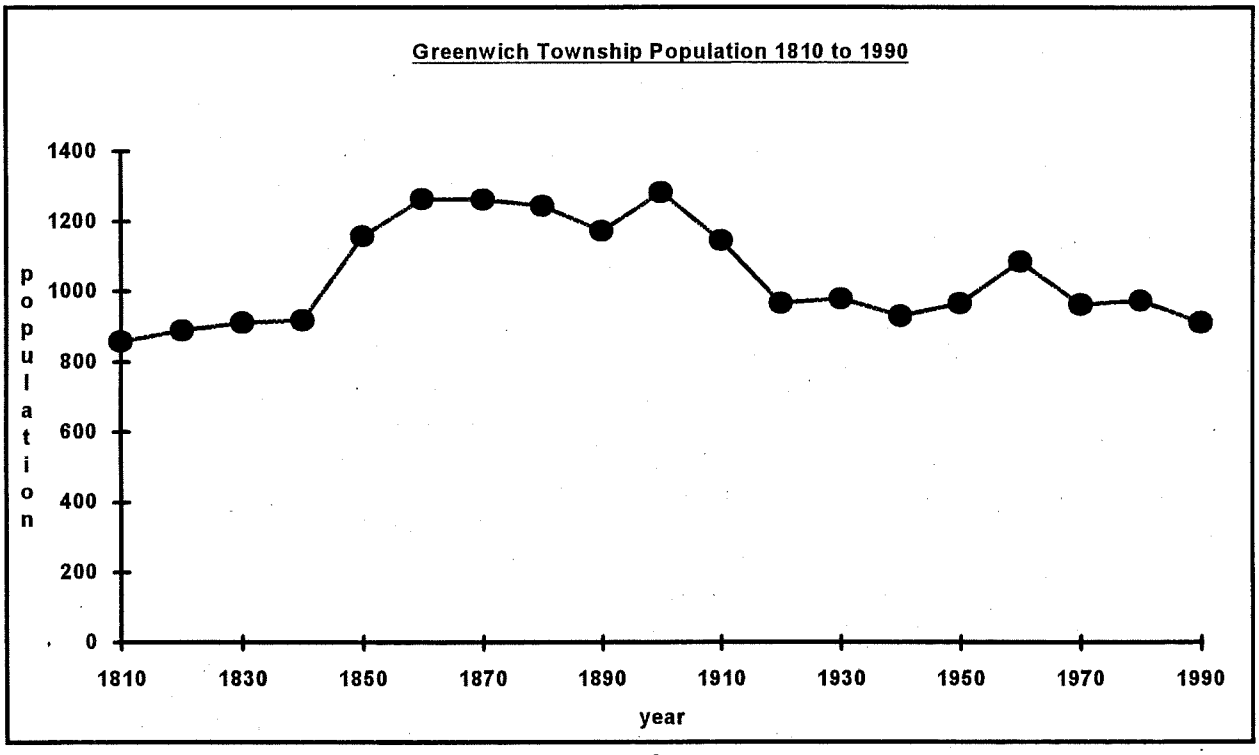
Based on the 1990 Census count of 911 inhabitants and a land area of 18.16 square miles, Greenwich has a population density of 50.2 persons per square mile. By comparison the county-wide population density is 282.1 persons per square mile. **Map 14** shows population density by census block for the Township. Of the Township's 911 inhabitants, 803 (88 %) live in rural non-farm settings and 103 (12 %) live on farms. Population distribution is scattered among individual, isolated rural dwellings and in several villages of relatively higher density development: Greenwich village, Othello and Springtown. The population concentrations tend to occur along the roads leading to Hopewell Township. There is little population towards the Delaware Bay beyond Bacon's Neck.

The Township's low density and rural pattern of population distribution has several major planning implications. For example, typically a threshold density exceeding 2,500 persons per square mile (less than one acre lots) is needed to economically justify public sewer service. A threshold of 1,000 persons per square mile (one to two acre lots) is needed to justify the installation of public water. Greenwich does not have such densities, except perhaps in the historic district of Greenwich village.

Population Trends

Greenwich Township has undergone relatively little population change, varying by no more than 50 % over the past 180 years for which records have been kept. Its population has ranged from 858 in 1810 to a peak of 1283 in 1900. Since 1900 the population trend has exhibited a general decline, interrupted by noticeable increases in the 1950 and 1960 censuses. To illustrate how relatively constant Greenwich Township's population numbers have been, the 911 persons recorded by the 1990 census are one less then the 912 persons recorded by the 1830 census. By comparison during this same period the total County population has grown from 14,091 to 138,053.

Figure 1



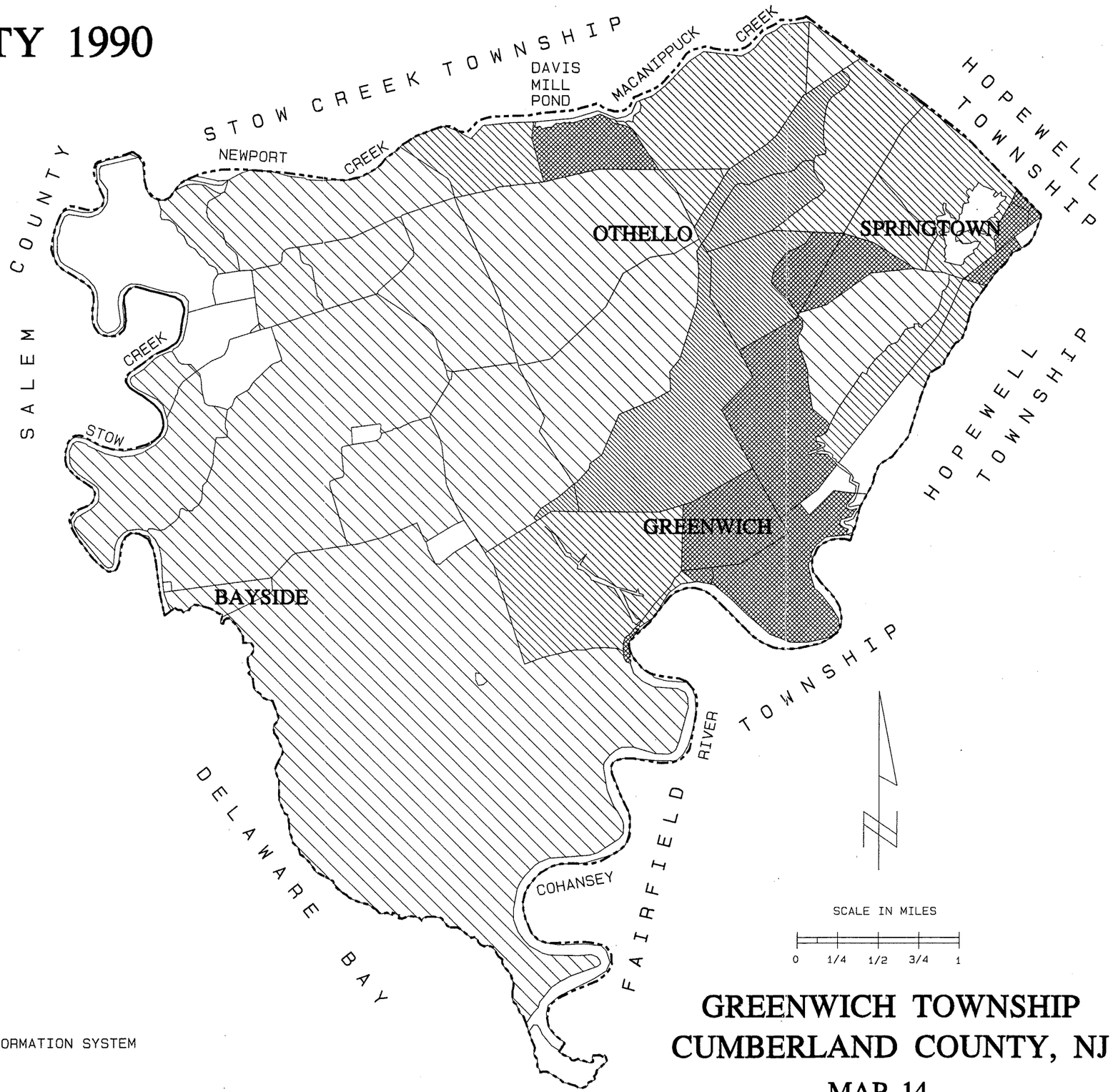
This long-term general trend exhibited by the Township of almost flat growth or slight decline in population is similar to the other bayshore and/or rural communities of Stow Creek Township, Downe Township, Lawrence Township and Shiloh.

The 1990 Census showed a loss of population in Greenwich from 973 persons in 1980 to 911 in 1990, a 6 % decrease. Other Cumberland County municipalities that also lost population between 1980 and 1990 were Downe Township, (-6%) Hopewell

POPULATION DENSITY 1990

LEGEND

- Over 150 Persons / Sq. Mi.
- 101 - 150 Persons / Sq. Mi.
- 50 - 100 Persons / Sq. Mi.
- 1 - 50 Persons / Sq. Mi.
- Unpopulated



DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
SOURCE: 1990 U.S. CENSUS

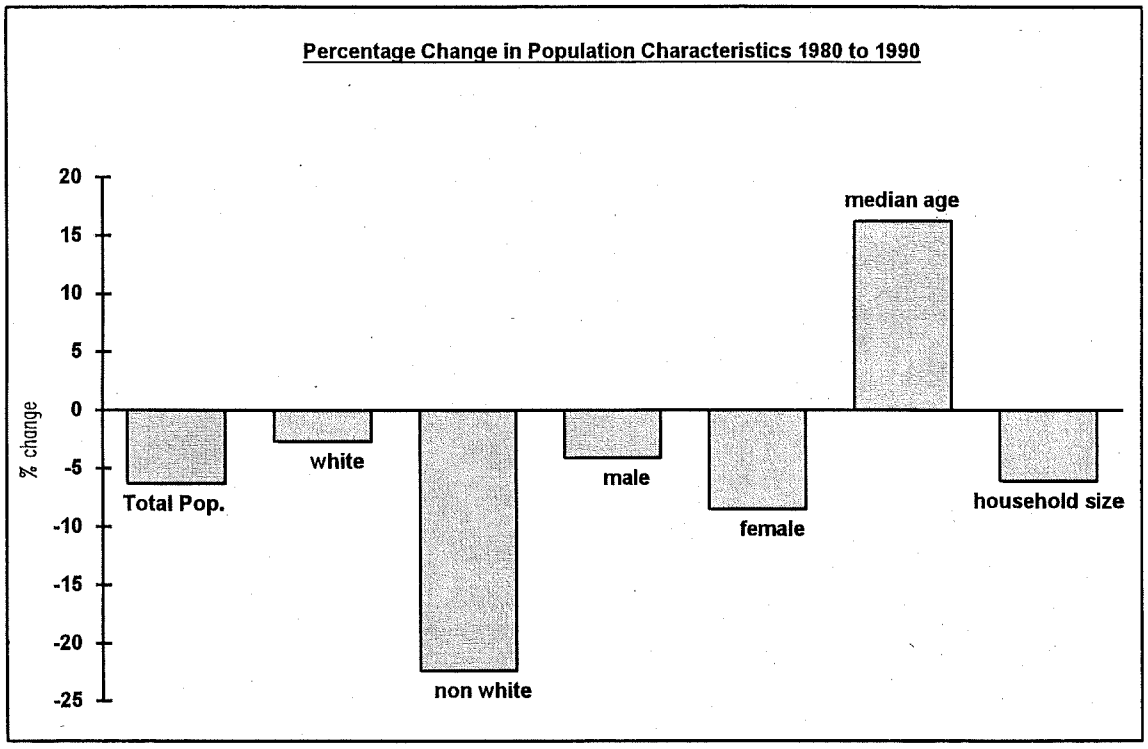
PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 14

Township (-3%) and Shiloh (-33%). Neighboring Stow Creek Township had a 5% increase.

The following chart in **Figure 2** shows the trends for selected Township population characteristics between 1980 and 1990. Almost all segments of the population by race, sex and age experienced a loss. Total, white, non-white, male and female populations decreased. The loss of non-white population is particularly striking and continues a trend identified in the 1978 Greenwich Township Future Land Use Plan which attributed the loss to a decline in the labor needs of agriculture. The only population characteristic showing an increase is median age.

Figure 2

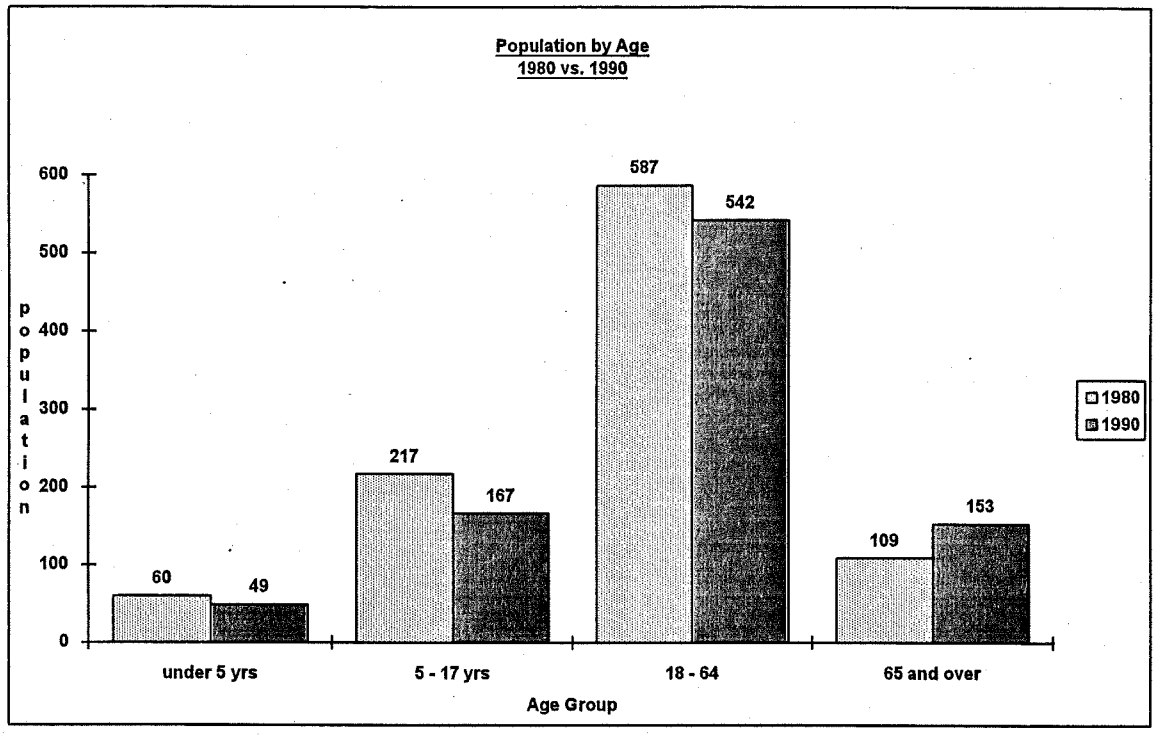


The increasing median age of the Township is caused primarily by an out-migration of the younger and middle- aged population. A comparison of age cohorts from 1980 and 1990 in Figure 3 reveals that the Township has lost population in all age groups except for the 65 years and older. The population under 65 years of age decreased by 106, while the population 65 years and over increased by 44.

The changes within age groups have several implications. The largest decrease is within the 5 - 17 year old age group. This

reflects a decrease in household size from 2.94 persons per household in 1980 to 2.76 persons per household in 1990 as households have fewer children. The number of infants, pre-school and school age children have decreased, as have the number of people in the work force age group of 18 - 64. This decreases the demand for school and recreational facilities and single family housing. The increase in the population 65 years and over indicates more retirees, fixed incomes, health concerns and leisure time.

Figure 3



Housing and Households

The total number of housing units in the Township was 358 according to the 1990 Census. The large majority of those units were owner-occupied, single family, detached homes. Similar to population trends, the supply of housing units decreased, albeit slight. The total number of occupied housing units decreased by 1 from 331 in 1980 to 330 in 1990. Owner-occupied units actually increased by 6 from 271 to 277 but this was offset by a decrease in renter occupied units from 60 to 53. Total vacant units increased from 26 to 28. By housing type the single family unit category had the largest decrease,

from 350 units in 1980 to 336 in 1990. Multi-family and mobile home/trailer units increased from 7 units in 1980 to 18 in 1990. A comparison of various housing characteristics from the 1980 and 1990 Censuses is presented below.

TABLE 14

HOUSING CHARACTERISTICS

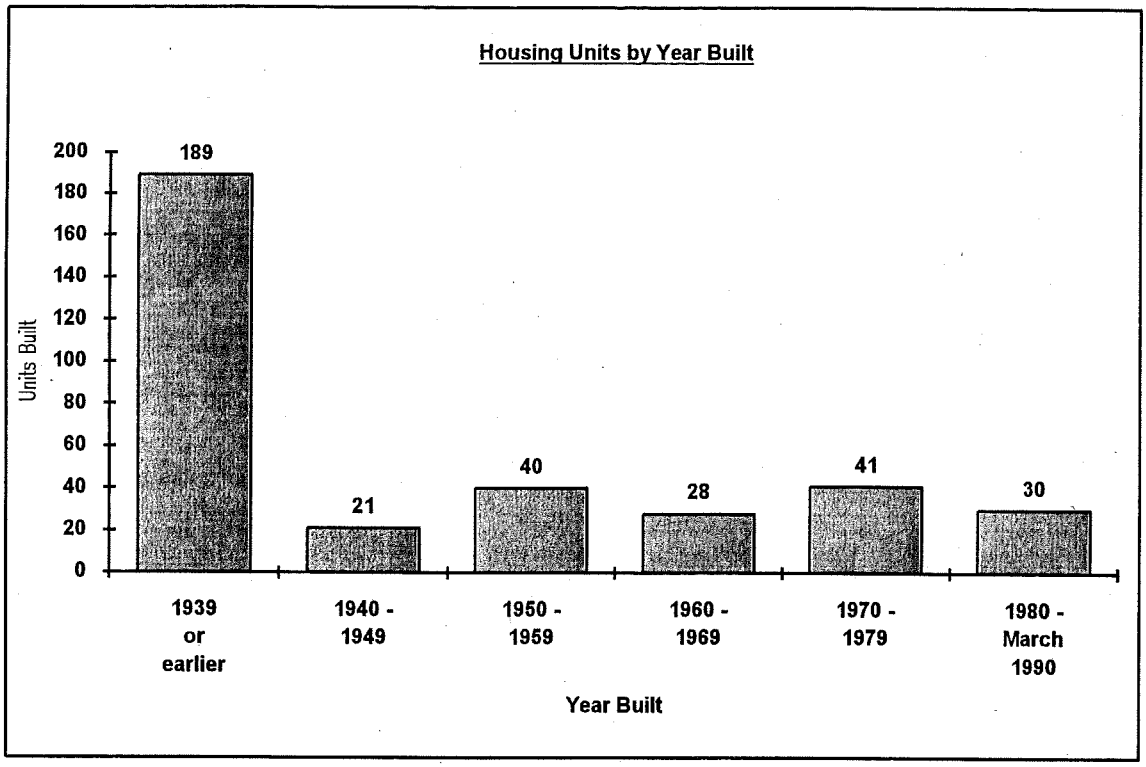
	1980	1990	% change
housing units (total)	378	358	(5.3)
single family	350	336	(4.0)
multi-family	3	6	100.0
year-round housing	357	n/a	-
housing units occupied	331	330	(0.3)
owner occupied	271	277	2.2
renter occupied	60	53	(11.7)
vacant	26	28	7.7
mobile home/trailer	4	12	200.0
persons/occupied unit	2.94	2.76	(6.1)
median value owner occupied	$ 36,600	$ 90,000	145.9

The median value of $ 90,000 for owner occupied housing is the highest in the County, compared to a countywide average of $ 73,900. The total value of this housing is over $ 30 million.

There were 330 households in 1990, and 209 of those (63 %) were married couple families compared to 54 % countywide. Average household size was 2.74 people. No persons were living in group quarters.

Of special note is the age of the housing. As **Figure 4** shows over 50 % of the housing units were built over 50 years ago. The housing stock is much older than the rest of the county and the state with 54% (189 units) more than 50 years old compared to 27 % in the county and 25 % statewide. The decades of the 1950's and 1970's were also recent, relatively active periods of housing construction.

Figure 4

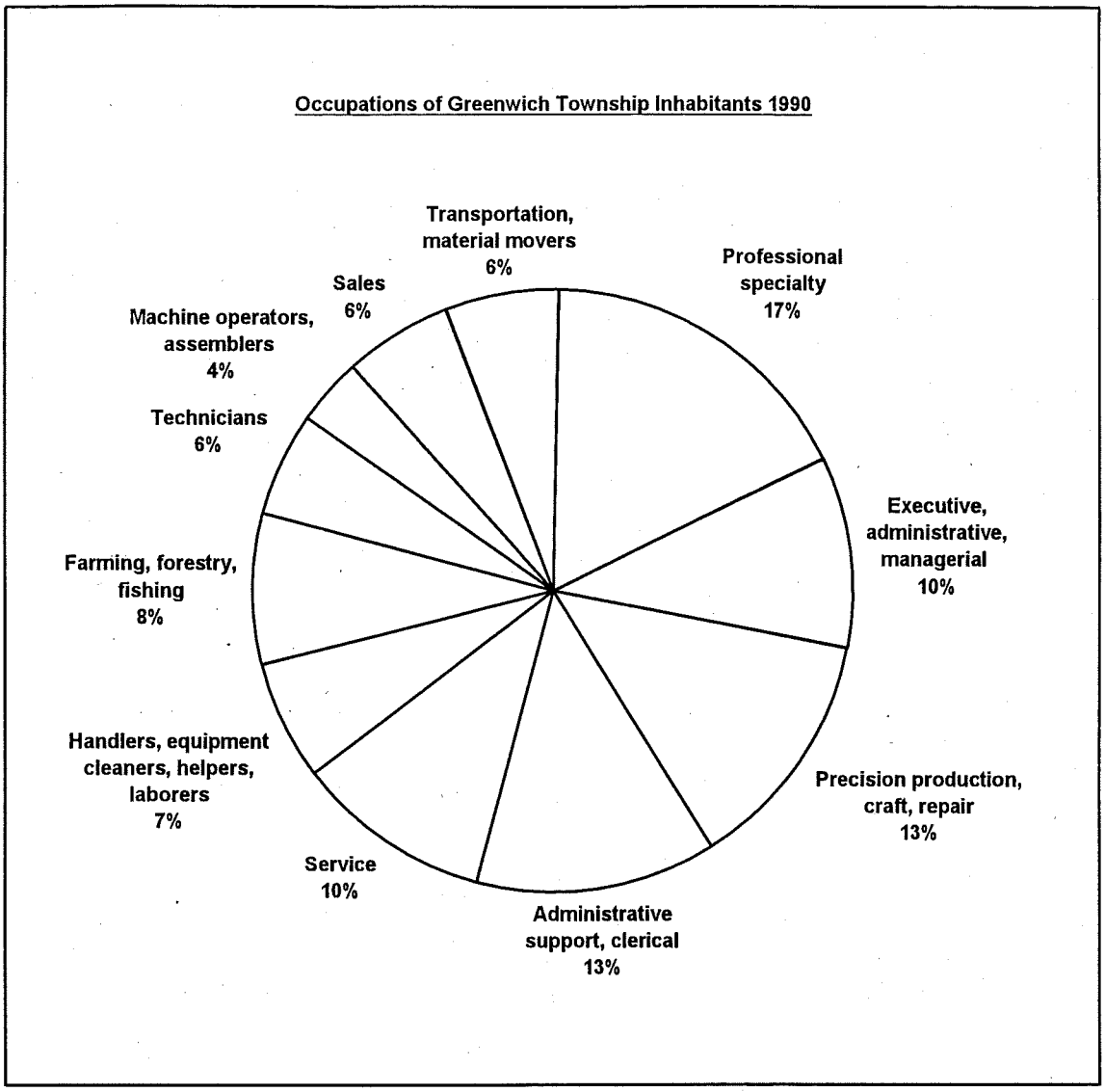


Employment

The 1990 population of Greenwich contained 441 persons within the work force of which 411 were employed and 28 were unemployed. The occupations or positions held by the work force are relatively evenly distributed as shown in **Figure 5**. Over 50 % of the work force is employed in a professional specialty, precision production, administrative support, executive management or service type occupation. Farming, forestry and fishing trades make up 8 % of the work force from the Township compared to only 2 % of the work force county-wide .

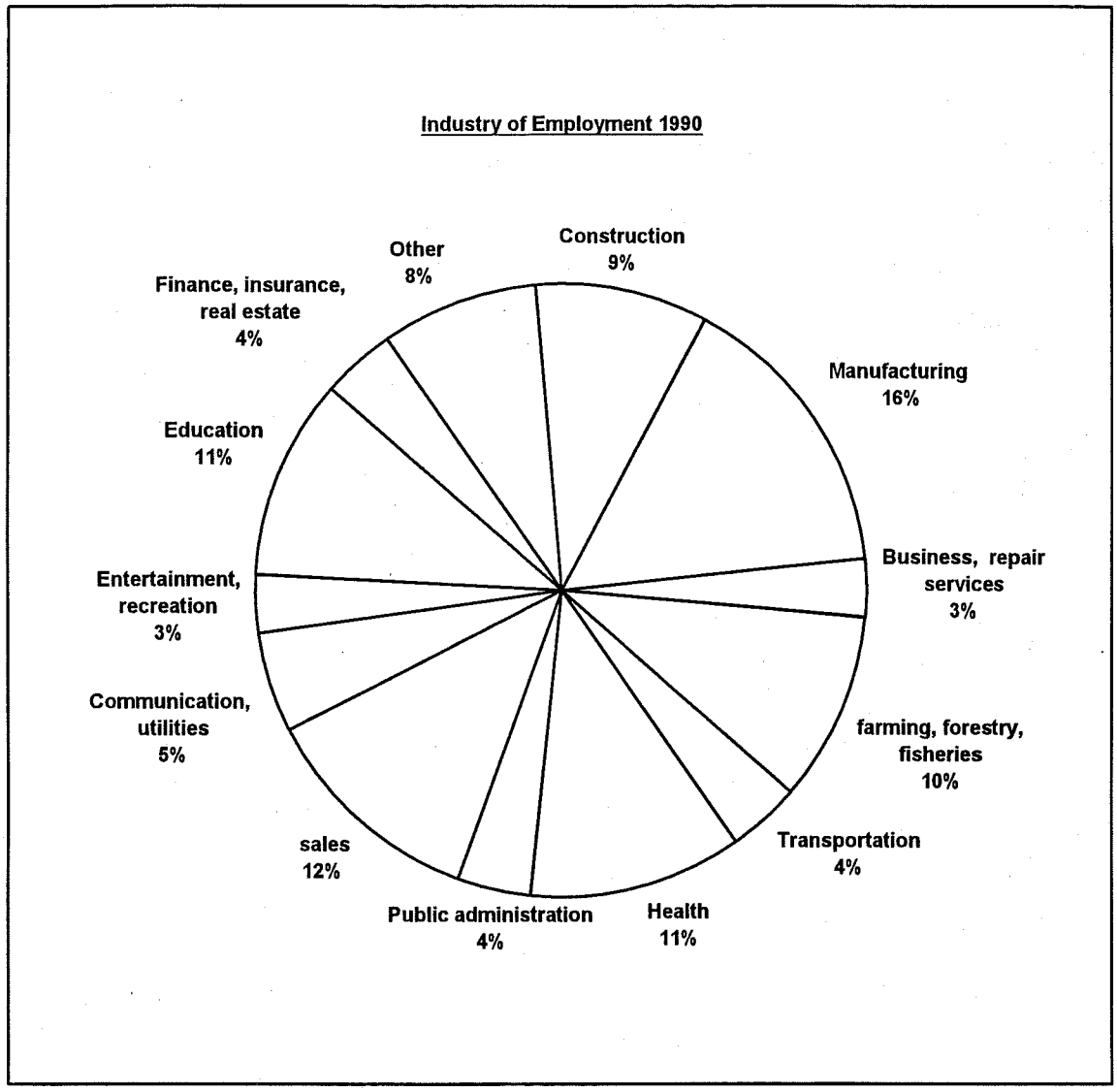
The industry sectors employing the work force are also evenly distributed as shown in **Figure 6**. The five largest industry sectors employing the Township work force are manufacturing (durable and non durable); sales (retail and wholesale); education; health; and farming, forestry and fishing. Combined these sectors employ 60 % of the Township's work force population.

Figure 5



In 1990, the New Jersey Bureau of Labor and Industry reported only 54 covered jobs (covered by unemployment insurance) within the Township. A more inclusive estimate of 83 jobs within the Township was drafted by the South Jersey Transportation Planning Organization. This means that about 350 people residing in Greenwich, or 75 % of the Township's working population, work outside of the Township primarily in Bridgeton. Other significant employment locations for Greenwich Township inhabitants include Vineland, Millville, the rest of Cumberland County, Salem County, Gloucester County and Atlantic County.

Figure 6



Population Restraints

Several regional and local factors have combined to limit Greenwich's population growth. Regionally, the portion of southern New Jersey in which Greenwich Township is located has not experienced intense development pressures. Even though Greenwich Township and Cumberland County are within the Boston-Washington Growth Corridor (also known as the northeast megalopolis), the County and the Township are outside the path of immediate development.

TABLE 15

POPULATION PROJECTIONS

	1990 Census	Forecast Year 2000	2010	2020
NJ Department of Transportation	911	942	972	960
Urbanomics/Office of State Planning	911	-	940	-
Cumberland County Cross-Acceptance Report, March 1992	911	-	1,182	-

All the above projections assume a reversal of the Township's long term population decline and forecast low to moderate growth in population. The projected percentage increases 1990 to 2010 range from 3 to 30 %; in absolute terms the projections range from 29 to 271 people.

Because of the general decline in population throughout the century it is difficult to project population without showing a continuing decline. There are reasons, however, why a downward trend is unlikely. First, the drop infertility rates and family size has probably leveled off. These factors, which contributed to declines in municipal population in recent years will not affect the community as dramatically in the future. Second, development pressures are increasing in Cumberland County. Route 55 opens the region to new jobs and development. Third, the primary employment center for Township residents, Bridgeton, will have over 1,000 new jobs as a result of a proposed State Correctional Facility. These three factors will not directly impact the Township but there may be secondary impacts leading to limited development pressures.

Of course, projecting population in a community the size of Greenwich is a very risky proposition. One medium sized subdivision can alter significantly the anticipated increase. The municipal planning board must monitor development trends closely in the Township and be prepared to alter the projection and its anticipated impact on the community should it become necessary.

Population increases and development in the northeast have occurred in open spaces adjacent to established urban centers. To the north the extensive suburbanization of Camden, Gloucester, and Burlington counties results from their proximity to Philadelphia and Camden. Along the east side of the State growth has followed the Garden State Parkway down from New York City and northern New Jersey into Monmouth, Ocean and Atlantic Counties. Cumberland County's distance from existing urban centers and the distance of transportation linkages to other parts of the state have resulted in only moderate development pressures.

While the overall population of Cumberland County, neighboring Salem County, and the more distant surrounding counties of Gloucester, Atlantic and Cape May has grown, the increase has tended to occur in suburbanizing areas around existing urban centers. In Cumberland County suburbanization has tended to occur in the communities around of Bridgeton, Millville and Vineland.

On a local level Greenwich Township does not have soils and other natural characteristics to support medium to high density development without infrastructure. Growth and development is limited to lower densities that can be supported by on-site facilities.

Employment opportunities, both locally and regionally, are another factor affecting Greenwich's growth. People tend to locate near employment centers. Greenwich has little commercial or industrial development to create jobs. Agriculture, which is the primary land use within the Township, has undergone a decline of its labor needs as mechanization has increased. The other employment centers for Greenwich Township inhabitants are only moderate growth generators at best for this area. The largest regional employment centers for southern New Jersey residents are Philadelphia and Atlantic City, which are more than an hour commute away and employ only a few Greenwich Township inhabitants.

Population Projections

Population projections are inherently speculative because of the great number of factors involving social, economic and technology issues. Several population projections have been made for various purposes which can be used to give an indication of what is anticipated as the Township's future population.

FUTURE LAND USE

Future Land Use

This Future Land Use Section translates the background information into recommendations for the Township's future land use activities. First the guidelines underlying the land use plan are presented. The basis for the Township's future residential development and intensity of land use, the role of physiographic features and the preferred development patterns are included in the guideline discussion. Next, the future land use map , the types of land use, and the rational for their location within Greenwich are described. Special attention is given to the Bayside Tract, farmland preservation, expansion of the historic district concept and the concept of rural landscape preservation. Finally, the relationship of the Future Land Use Plan to state, county and adjacent municipal plans is reviewed.

The proposals and map presented here amend and supplement the Future Land Use Plan adopted in 1978. Consequently this plan will be the basis for the Township's development regulations. Under the Municipal Land Use Law a zoning ordinance may deviate from the adopted land use plan when a majority of the full membership of the municipal governing body approves such inconsistencies and gives its reasons. As a result the Future Land Use Plan has authority as a guide for community development.

This Plan reflects the current judgment of the Township Planning Board based on background studies and recommendations made by the County planning staff. Changing circumstances will require future revisions.

Land Use Guidelines

The study of Greenwich Township's natural features and existing land uses indicates that, while the Township has undergone little change and has no immediate prospects of rapid development, there are sensitive areas requiring protection. The main areas of concern are historic sites, farmland, wetlands, stream corridors, surface waters and floodplains. In addition much of the Township is subject to a seasonally high water table which severely restricts the use of septic tanks. This plan recognizes these vulnerabilities by using the following guidelines to recommend future land uses.

1) Ecologically sensitive areas should be kept in their natural state or undergo only limited development.

2) The Township, being a rural municipality whose primary land uses are agriculture, woodland and tidal wetlands, and containing a historic district that is one of the few intact colonial villages along the eastern seaboard, should maintain rural densities. Future development should be consistent with the present intensity of land use to insure that Greenwich's rural and historic character is not lost.

3) In order to encourage the preservation of farmland, development should be encouraged on agriculturally marginal soils that have high or moderate development potential. The conversion of agriculturally productive lands into nonagricultural uses is discouraged.

4) As long as the Township lacks a central sewer or water supply and relies upon on-site methods of wastewater disposal, its gross residential density should not exceed 45 dwelling units per square mile nor should its minimum single family residential lot size be smaller than 1/2 acre.

5) Leap-frog development which scatters development in an uncoordinated pattern should be avoided. Such development results in inefficient land use and generates more pollution and greater energy demands than compact development. As an alternative, the Township should channel future growth into an area or selected areas where adverse environmental impacts and social costs such as the loss of prime farmland or historic sites are minimized. Innovative site planning techniques which preserve open space, promote pedestrian circulation, increase the efficiency of dwellings and the community, and produce designs in harmony with historic structures should be encouraged.

6) The Township should seek to diversify its economic base by encouraging commercial, recreational, and industrial development which does not adversely impact the rural and historic character.

The Future Land Use Map

The **Future Land Use Map** (**Map 15**) shows the *generalized* future land use plan for Greenwich Township. It is drawn with consideration of the Township's existing land use and environmental constraints, regional growth patterns and projections, the State's coastal zone management program and the State Development and Redevelopment Guide Plan. It is intended to show generalized anticipated and desired future land use trends. It is not meant to be site specific

Compared to the 1978 Future Land Use Plan there are four major changes in future land use recommendations.

1. ***A newly proposed Rural Historic designation is recommended for the Bayside Tract.***

   This designation covers a landscape composed of a combination of agriculture, woodland, and tidal marsh interspersed with limited private residential opportunities to preserve historic dwelling sites. The Rural Historic designation totally replaces the 1978 Future Land Use Plan's industrial land use proposal and extends along the south side of Tindall Island Road and also covers farmland and woodland. As a result there is no area proposed for industrial land use within the Township.

2. ***Agricultural use is recommended for the existing agricultural area south of Sheppards Mill and Teaburners Roads and east of Mill Creek.***

   The Agricultural designation replaces the 1978 Plan's commercial land use proposal.

   The Township's population is too small at present to support extensive commercial facilities. The Urban Land Institute suggests a threshold population of 800 families, or 2500 persons, to sustain a small neighborhood shopping center (16,000 square feet in floor area). The location of future commercial facilities should be determined by the demand generated by population growth. Presently the Township's anticipated population trends do not support designation of a commercial area and the Township's rural transportation network does not provide ready access to serve or attract a regional market. Therefor, this plan does not designate any area as a commercial area. This does not mean that individual, discrete commercial operations can not operate within the Township. It

simply reflects that the Township does not have the existing or projected demand to support designating an area for commercial development.

3. ***A newly proposed Historic Expansion designation is recommended for the road frontage leading into the existing Historic Districts of Greenwich village and Othello***

   The purpose of this designation is to expand the application of the Historic District concepts to future development that could occur adjacent to, but outside of the Greenwich village and Othello Historic Districts. Encouraging the use of historic, traditional development and design standards buffers the Historic Districts by blending future development into the existing historic development. A further discussion of this idea is presented in the Historic Preservation section.

4. ***The area proposed for future residential development places more emphasis on the village centers of Greenwich, Othello and Springtown and less on the surrounding countryside.***

   The purpose is to reduce the nonagricultural demand for land outside of the existing villages, thereby reducing development impacts on the landscape and directing future development resources to existing developed areas.

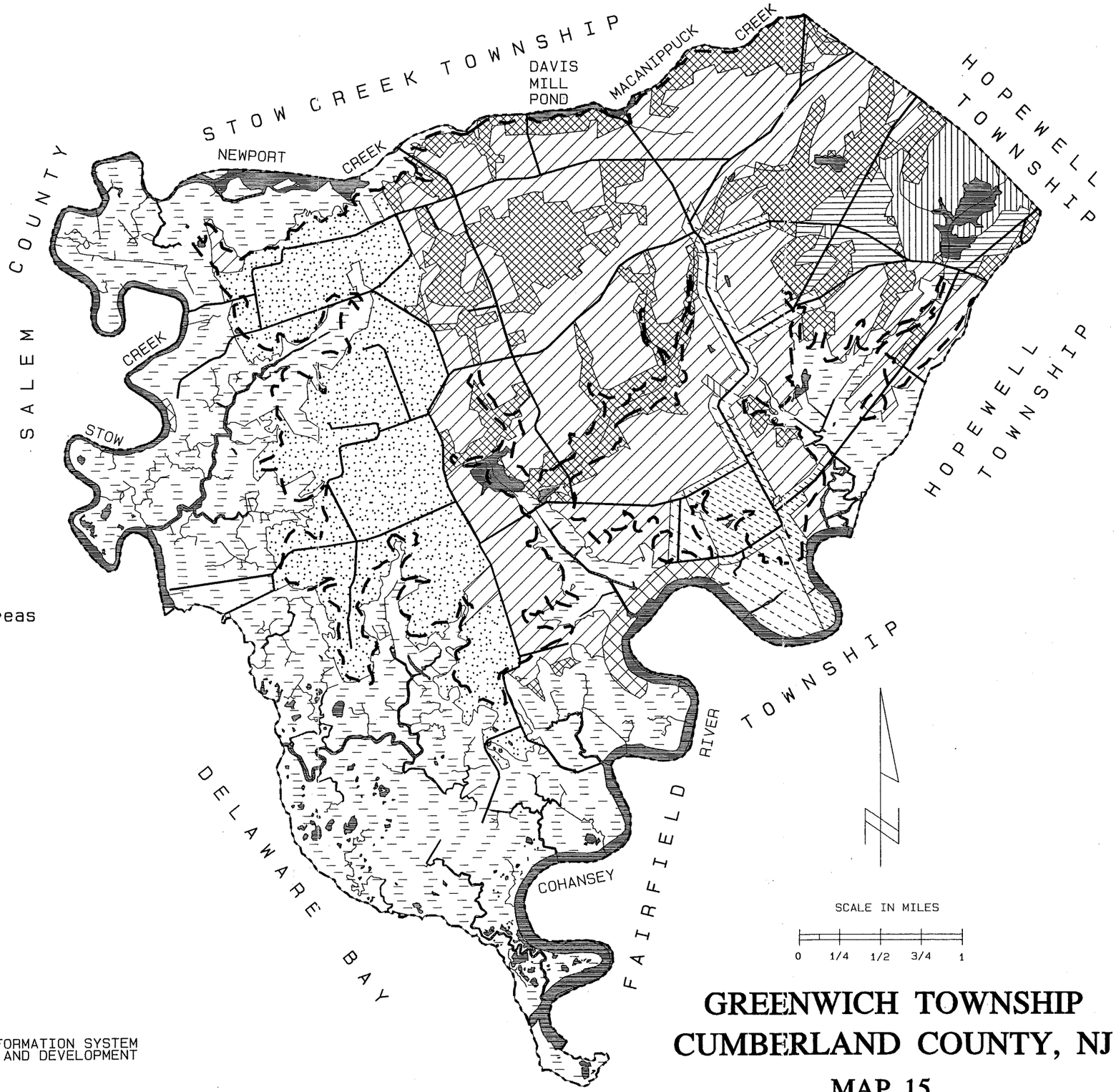
Future Land Use Designations

The **Future Land Use Map** uses the following designations. These designations are planning recommendations for the general types of land uses to maintain, encourage and anticipate within each portion of the Township. The actual designations are determined by evaluating existing land uses, historical resources, soil capabilities, and projected community development trends and demands.

Agriculture

Greenwich has substantial amounts of prime farmland. It is in Greenwich's best interest to keep this land in agricultural production since it accounts for approximately 40 % of municipal valuation yet creates little demand for municipal services. Most of the area shown as agriculture is already cultivated. It consists mostly of Class I and Class II soils, much of which has severe limitations for septic systems. The only residential uses which should be encouraged in agricultural areas, particularly in areas with low development capabilities, are dwellings for the farmer, members of the

FUTURE LAND USE



LEGEND

- Agriculture
- Residential
- Commercial Recreation
- Public Facilities & Recreation Areas
- Historic Conservation District
- Historic Conservation Extension
- Rural Historic Area
- Woodland
- Tidal Marsh
- Surface Water
- Limits of Flood Hazard Areas

DEVELOPED BY THE CUMBERLAND COUNTY GEOGRAPHIC INFORMATION SYSTEM
SOURCE: CUMBERLAND COUNTY DEPARTMENT OF PLANNING AND DEVELOPMENT

PREPARED FOR THE GREENWICH TOWNSHIP PLANNING BOARD
BY THE CUMBERLAND COUNTY DEPARTMANT OF PLANNING AND DEVELOPMENT - OCTOBER 1995

GREENWICH TOWNSHIP
CUMBERLAND COUNTY, NJ
MAP 15

farmer's family, and farm workers. To be viable, modern agriculture requires large contiguous parcels of land and buffering from incompatible uses. It is therefor important that Greenwich's agricultural lands not be broken up or intruded upon by nonfarm uses.

Historic District

Greenwich village and Othello are shown as historic districts based on the boundaries of the Greenwich National Register Historic District. Fifty three of the historic sites listed in that background study are located within the Historic District of this Future Land Use Plan. These two concentrations of historic sites should be protected from land uses and development that could alter their character. They are the Township's most valuable assets and contribute to the uniqueness of Greenwich Township. If the rural and historic appearance of Greenwich is to be maintained, the Township must encourage the preservation and restoration of these areas.

The historic sites and structures which lie outside the historic district also merit protection. Since these sites are scattered rather than concentrated, the Township's approving authorities should review development proposals for their impact on these sites. Under the Municipal Land Use Law, historic sites designated on the Master Plan for public areas may be reserved for one year after final subdivision or site plan approval or as agreed to by the developer. During that year, the governing body must decide whether to purchase or condemn the site. If, after this period, for which the municipality must pay compensation to the developer, the municipality does not buy or condemn the site, the land may then be improved despite the historic nature of the site (N.J.S.A 40:55D-44).

Historic Expansion

Current development patterns make the Historic Districts very evident as you enter and leave them. Development along Pier Road, Bacon's Neck Road, Delaware Ave, and the section of Ye Greate Street between the historic districts of Othello and Greenwich village can have a great visual impact on how a person perceives the Historic Districts. The land fronting these roads leading into the official Historic Districts are recommended for the new designation of Historic Expansion. This applies to land formerly designated agriculture in the 1978 Plan. The official Historic District boundaries are not changed. The Historic Expansion designation indicates that development and design controls should be applied to new development for the purpose of continuing and protecting the historical themes of the Historic Districts beyond their official boundaries.

Rural Historic

The Rural Historic designation is specifically for the upland portion of the Bayside tract. Land use and development are intended to be limited to those which have traditionally occurred specifically on the Bayside tract.

Most important are the ten existing or former dwelling sites, five of which may be eligible for the National Historic Register. These dwellings have been vacant or leased under the ownership of a consortium of electric power companies but in the future the dwellings should be private, owner occupied residences with deed restrictions to maintain the historical context of the structures and property. The overall amount of land devoted to residential use is very minor but those dwellings should remain as the dominant structures upon the Rural Historic landscape.

The Rural Historic also contains a significant amount of farmland. Farmland is also encouraged to be privately maintained while woodland and tidal marsh areas may be used for public open space. Existing landscape features are to be preserved and serve as controls on the design of any development.

More information is presented in the Bayside Tract Future Land Use section of this Master Plan.

Commercial Recreation

The Future Land Use Map shows Commercial Recreation areas in Greenwich. The commercial recreation areas are intended to be sites where recreational and commercial boating, fishing and associated activities can be serviced and supported. With its historic sites and the recreational potential of the Cohansey River and Delaware Bay, the Township attracts and supports recreational and tourist activity. The Commercial Recreation designation takes advantage of the Township's water access and encourages activities that strengthen and diversify Greenwich Township's economic base.

Residential

The two areas proposed for future residential land use are presently a mix of woodland, vacant land and low density residential uses. They are both located in the northeast corner of the Township. One is located in Springtown centered around the intersection of Greenwich Shiloh Road (Co. Route 620) and Sheppards Mill Road (Co. Route 650), and the other is along both sides of Greenwich Bridgeton Road (Co. Route 607). Any future residential development in these areas should be consistent with the Township's land use and historic

preservation policies and state coastal zone management policies.

The designated areas have several advantages over the rest of the Township for future residential development.

1. It concentrates residential development in one section of the Township while maintaining an overall low gross density.

2. The area has a mix of class III and IV soils and does not cover any farmland.

3. The area has mostly moderate or slight limitations for septic systems.

4. It is in the Township area with the greatest potential for a water supply least likely to be affected by saltwater intrusion.

5. It maintains the open space separation between Othello and Springtown

6. It is along the roadways with the closest access to State Route 49 and Bridgeton.

7. The topography helps conceal development so that it would not be visible on the landscape viewed from the southern portion of the Township.

With no sewer service, the lot size permitted should be no smaller than 1/2 acre for a dwelling unit, with a gross density no greater than 1 dwelling per acre and preferably less . Woodlands should be retained as a buffer between the residential areas and agricultural land and the historic district in Othello. The future residential land as shown contains a total of approximately 200 acres. The Springtown portion is about 140 acres; the Greenwich Bridgeton Road portion is 60 acres. If 3/4 of both areas can be subdivided into buildable lots, that provides an estimated 175 acres for development. Fully developed at one unit per acre into 175 dwelling units and 3 persons per unit, the area could contain 525 people.

Population projections in the Background Section of this Plan range from 29 to 271 additional people by the year 2010, therefor the area designated residential should be more than enough area for anticipated needs.

Woodland

The areas shown as woodland are mostly existing stands of forest which should be preserved. Much of the woodland occurs as narrow strips of land on either side of a stream. They are frequently, though not necessarily, part of the flood hazard area. The lands along a stream serve as habitats for wildlife and vegetation, filter out pollutants and silt in runoff, and stabilize stream banks. The Township's stream corridors should be protected as part of the Township's regulation of floodplains. This will create greenbelts which help catch rain to recharge aquifers, prevent banks from breaking away in high water, and minimize flood hazards.

A second major wooded area surrounds Sheppards Millpond. This has been designated for recreation since it is in the Pond's watershed and recreational uses already take place there.

Whenever residential development occurs in a wooded area, site planning techniques, such as clustering, should be utilized to save woodland as open space.

Tidal Marsh and Flood Hazard Areas

The Township's tidal marshes should be left in their natural state. These are among the most sensitive and ecologically valuable areas in Greenwich. It is clearly the intent of both CAFRA and the Wetlands Act to preserve coastal marshes.

Tidal marsh is unstable and requires fill prior to building. It is also subject to flooding and a high water table. Left as is, the wetlands serve as a barrier to storms and floods that threaten the Township. The marsh also protects water quality by trapping nutrients and silt from upland runoff and it servers as a spawning ground for a variety of fish and game.

The Township's flood hazard areas should be left as open space with limited development. Excessive construction within the flood areas subjects life and property to possible injury and can also increase runoff and flood damage. Moreover, septic systems and wells in a flood hazard area are vulnerable to malfunction and contamination. Consequently, the **Future Land Use Map** shows flood hazard areas as either tidal marsh, woodland or agriculture except where development, as in the historic village of Greenwich and the Commercial Recreation areas, has already taken place.

Public Facilities and Recreation

The Future Land Use Map shows both existing and proposed community facilities. A play field is shown at the intersection of Springtown Road and Roadstown Road. This would serve Othello and Springtown.

The Morris Goodwin School and its adjacent grounds also have potential for meeting community recreation and social needs. Facilities developed there could serve both the school and the adult population.

Sheppards Mill Pond is one of Greenwich's most desirable amenities. It's preservation as a recreation area is recommended. The surrounding wooded area the should be preserved in a natural state to protect the Pond and shore from encroachment and polluted runoff. By designating the watershed as a public area, Greenwich could exercise its option under N.J.S.A. 40:55D-44 to reserve the area from development for one year after final subdivision or site plan approval. During that period, Greenwich can explore means of acquiring the site. Since the Pond's watershed lies partly in Hopewell Township, Greenwich should seek Hopewell's cooperation in limiting the watershed's development.

Historic Preservation

This section discusses options for preserving the historic resources of the Township and the application of historic preservation concepts to areas adjacent to the historic district and in surrounding cultural landscape.

The background section of this Master Plan highlights the long and significant history of Greenwich Township. From colonial days to the present, Greenwich has played an important role in the growth and development of Cumberland County. Today, Greenwich village stands as one of the most prominent examples of a colonial American community anywhere in the region. Unspoiled by rampant development, the future of the village and its rural, agricultural environs are very much related.

Over the years, it has been the strength of the agricultural industry and the relatively limited development pressure in Greenwich Township that has kept the lands adjacent to the village undeveloped. In order to maintain the historic integrity of the village, the rural environment within which the village is situated has to be protected as well. To accomplish this, the various elements of the Master Plan must work together. The Township Planning Board recognizes that the importance of historic preservation does not end at the district boundary. The integrity of the Township's historic district also depends upon the outlying farmsteads and landscape. Specifically, the concern is that the Historic District is vulnerable to development that may occur outside of the district.

The options for historic preservation contained in this section complement the directions set forth in other sections of the Master Plan on future land use, the Bayside Tract and farmland preservation, so that the character of the entire area is not compromised.

The Historic Context: National Guidelines

Planning for the protection of historic sites and structures is the most effective means of coordinating the many influences that can have an impact on the resources. Too often, historic preservation is used in a reactionary manner to prevent the destruction of a historic building or site. When this occurs; the larger context of the historic resource is often ignored or it is too late to fashion an appropriate plan that complements the big picture. Comprehensive historic preservation planning seeks to avoid the land use conflicts that can often infringe on the history integrity of an area.

The National Park Service defines an historic district as that which "possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development." These districts can be large or small and based upon any number of historic, architectural, and cultural themes. They must also be entities which are easily distinguished from their surrounding environs. This definition and other guidelines for the inclusion of sites and structures and districts on the National Register of Historic Places are extracted from the following publications: *The National Register Bulletin*, U.S. Department of the Interior, National Park Service, September 30, 1986; *How to Apply the National Register Criteria for Evaluation*, U.S. Department of the Interior, National Park Service, June 1, 1982 Draft.

Seven criteria help define the historic integrity of a district or site. These criteria are useful in determining whether a site or district is appropriately historic, relative to its surroundings. They include *location*, *design*, *setting*, *materials*, *workmanship*, *feeling*, and *association*.

The *location* and *setting* of historic resources refer to the relationships between what was and what is. If a site or structure is located in the same place that it was originally built or founded, its historic context has not been disturbed. On the other hand, if a structure or site has been moved, the historic relationships between the natural and man made surroundings have probably been destroyed. "*Setting*", on the other hand, illustrates the character of the place in which the resource played an historic role. Battlefields are good illustrations of the difference between location and setting. The location of a particular battle is a well-documented historic event. The location remains constant over time. But if there have been changes to the landscape, topography, or character of the property or its surroundings, the setting has been compromised and the historic character diminished. This debate between concerns over location and setting led to some of the recent controversies surrounding civil war battlefields and the degree to which modern land uses should infringe on them.

The *design*, *materials*, and *workmanship* of sites and structures are also important and relate to the historic decisions regarding the location, construction, and organization of historic resources. Whether it is the architectural character of a building, an unusual stone, masonry product, or other building material, or the physical relationships of structures

to one another, these criteria are important and very tangible considerations in judging historic context.

Less tangible are the criteria concerning the "*feeling*" or "*association*" of historic properties. Does a property evoke a sense of being part of the past? Are there sufficient remaining physical characteristics to convey the historic qualities for which a site or structure is known? Are there direct links between a property and a particular person or event? These questions are often difficult to answer. They can also be subjective, making the historic context or integrity of a site complicated to define.

The Historic District

Greenwich Township's historic district was nationally recognized in 1972. The dimensions of the district and the number of historic sites and structures are shown on the map of historic resources found in the history narrative of the Background Section. This district has been accepted by the National Park Service as one that meets all the requirements of the National Register. **Map 16** illustrates that the *local* historic district regulations in the current municipal zoning ordinance apply to only a limited portion of the nationally registered historic district.

The Township should also consider applying to have Springtown designated on the National Register of Historic Places.

Clearly, the national historic register district continues to have a high degree of historic integrity. The location of the historic resources in the district remains intact. The additions and alterations to homes and structures in the district are of high quality and the integrity of the original structures is very sound. The feeling one gets from being in the district is directly related to the high level of architectural quality, materials, and workmanship that is central to the management and administration of the district. There remains a strong sense of the eighteenth and nineteenth century character that was so important to the district being nominated and included in the national historic register. The villages of Greenwich and Othello are still set in a very rural environment and maintain a well defined sense of place. Issues raised by the Township planning board regarding the historic district have centered on fine tuning the Township's district regulations in response to changes in policy and development trends.

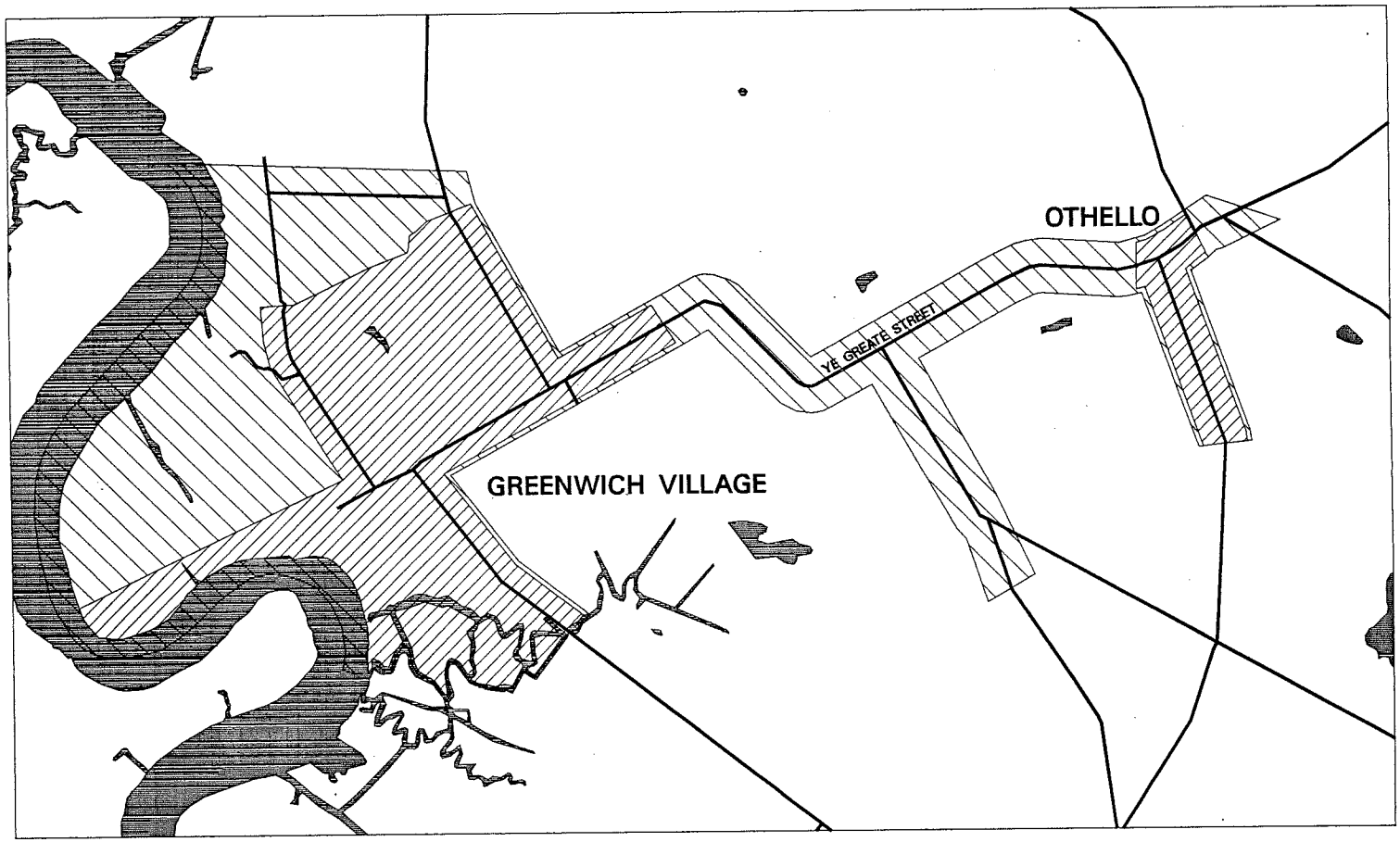
A primary issue involves the pattern of infill development in the historic district. In Greenwich's traditional pattern of village development homes were constructed very close to the street line. Accessory buildings and structures were constructed close to the main structure or attached to it. The Township Planning Board encourages this pattern for new development. To advance this traditional pattern, the land use regulations for the historic district should allow new development to be built in traditional patterns. This involves rethinking many of the standards typical of current zoning. For example, most ordinances reference "minimum setbacks" which require new buildings and structures to be constructed a minimum number of feet from the street or right-of-way line. To encourage village infill development compatible with historic trends and patterns, a "*maximum setback*" would be a more logical requirement. This would ensure that new development is in line with the historic building line found in the village.

The Township's historic district regulations should allow, if not require, designs, scales and types of development consistent with historic patterns. Several items for development review include architectural standards, landscaping, setback, bulk requirements, orientation of the structure to the street, building height, general architectural character, and the development of ancillary buildings and structures. In addition, the review should cover parking issues, sidewalks and walkways, signs, street lighting and other roadway improvements.

The Cultural Landscape

Greenwich village is surrounded by an unbroken rural landscape. Traditionally, this landscape is a part of farming operations, either as actively cultivated fields, or as woodlots and wetlands. Formed by a combination of manmade and natural features, it can be termed a cultural landscape. It provides the overall historic setting upon which the village has developed. The cultural landscape is visible as scenic views, commonly seen from the roads and also from the Cohansey River and the Bayside observation platform. The importance of the cultural landscape was succinctly summarized by a planning board member: when someone looks out their backdoor in Greenwich they want to see fields and trees, not someone else's backdoor.

No matter where you are in the Township the landscape is a prominent feature. The viewsheds of the Township, the portions of the landscape viewed as scenery, should be evaluated to identify primary and critical viewsheds that



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Historic Conservation Zone

National Historic Register District

Surface Water

GREENWICH TWP. HISTORIC DISTRICTS

Map 16

might need special efforts to preserve. This can include noting scenic roadways to receive special consideration during road work or development review activities. For the Bayside Tract where the landscape exists as a large contiguous entity, the Township might pursue national designation of the cultural landscape as a district similar, and complementary to, the historic district. Any development visible within a viewshed should be rural in nature.

Preservation Options

A set of recommendations is not provided because of the wide variation in historical resources that the Township planning board would like to see preserved, ranging from site specific houses to large scale landscapes. Instead a discussion of options is presented from which the planning board can select to pursue further should the need arise, in response to specific circumstances such as one large scale development proposal in a fixed location or an ogoing trend of single lot subdivisions throughout the Township.

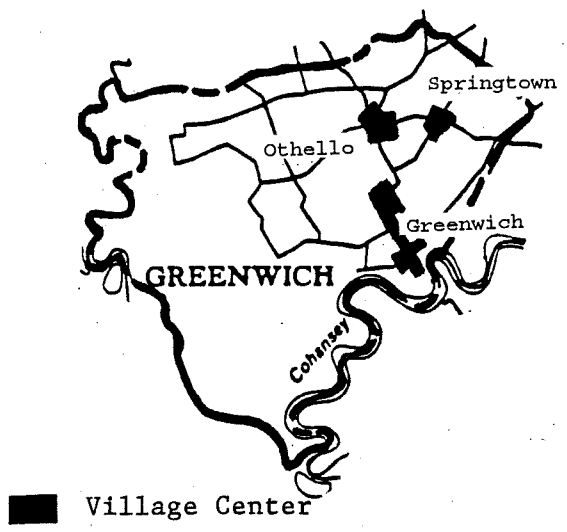
While development pressure in the Township is limited, it is possible that a large-scale development proposal, located outside the Historic District but with the potential to destroy the unbroken landscape and consequently the rural integrity of the Historic District, could be submitted to the Township planning board . Should that occur, adapting new construction to complement development patterns of the existing villages, or that protects the integrity of the villages by providing suitable buffers between the village and the new development, will be critical. To accomplish this the Township has several options.

One option would be to regulate the desired development patterns through large-lot zoning. By zoning lands outside the village at densities of 1 unit per 25 or more acres, (or greater), the community would be assured that very little new development would infringe upon the historic district or the historic villages.

The Township planning board, however, is sensitive to property owner concerns about land equity. Board members expressed a desire during their workshops and public meetings to strike a balance between the community's goal to preserve its historic and agrarian character and the landowner's right to realize a fair return on his property. Therefore, a more creative approach to the conservation of rural lands around the historic villages is necessary.

Techniques to preserve both the historic district and the landscape center around two basic options: zoning control and land acquisition. With either option the goal is to create open space buffers around Greenwich, Othello and Springtown.

Figure 7



Village development boundaries could be established and zoning techniques generated to provide incentives for the location of new construction within the parameters of the village boundaries, (**Figure 7** at left.) Specific techniques that the Township may wish to consider include a cluster development provision in the zoning ordinance, a village extension zone to direct village development, a transfer of development rights program, and performance zoning standards to help direct development. In addition, land acquisition techniques could include purchase of targeted lands by conservation trusts, purchase of easements on targeted farmland through the County farmland preservation program, or easement purchase through a conservation trust or the State Green Acres Program. All land acquisition initiatives should rely on voluntary, willing sellers. The details of these techniques follows.

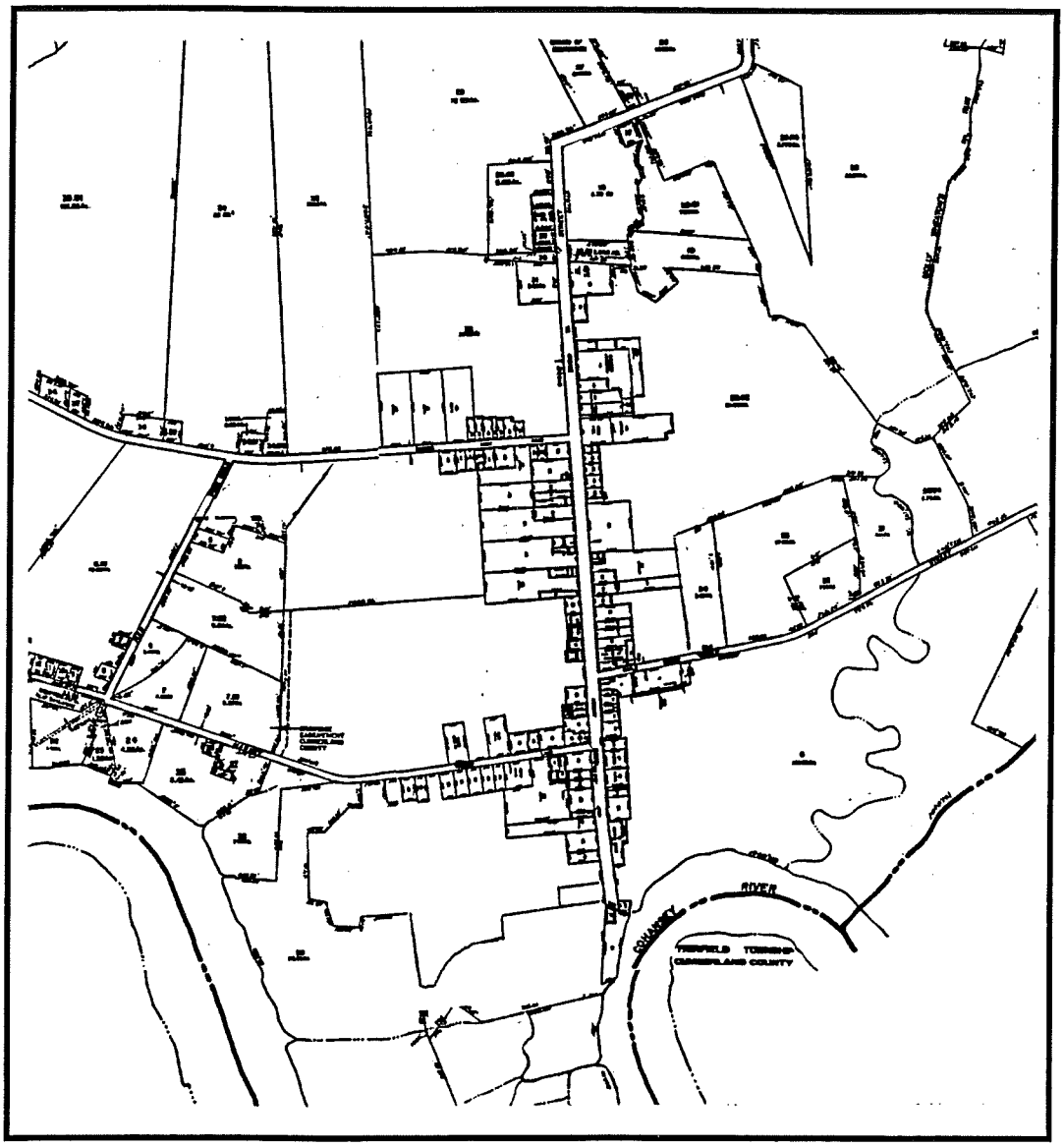
Figure 8 illustrates the current land ownership patterns in the vicinity of Greenwich village. As can be seen from this map, while there has been a limited number of small lots created outside the village, Greenwich property is still well defined. This pattern of development, however, will slowly erode as more small lots begin to infringe upon the boundaries of the village.

Cluster Development

Regulations for cluster development include incentives to locate new lots and construct new development in a denser than otherwise permitted pattern, in order to permanently protect open space, farmland, the integrity of an historic village, or some other community goal. For example, **Figure 9** shows a one hundred acre parcel of land, zoned at a residential density of one unit per ten acres. At this density, the owner would have

Figure 8

Lot Patterns in and around Greenwich Village 1994

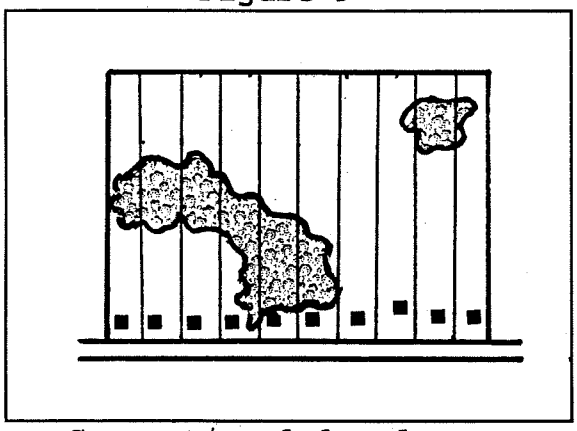


Source: Real Estate Atlas of Cumberland County, 1994.

the right to develop ten housing lots. Based on conventional zoning, these lots are then spread across the entire one hundred acre tract, leaving no usable agricultural or active open space.

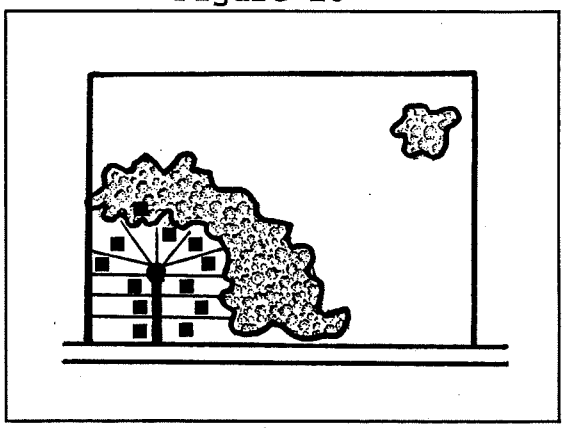
In **Figure 10,** the same ten residences are clustered in a corner of the lot, away from the local village and screened from the roadway by vegetation. Each lot is one acre in size, leaving 90 acres in permanently protected farmland or open space. A variation on this technique would allow for more than ten units to be built if the developer agrees to cluster them and keep them removed from prime farmland, endangered species, village development, scenic landscape views or other natural and man-made features that the Township elects to protect. These "performance criteria" can be folded into or remain separate from the cluster regulations.

Figure 9



Conventional lot layout

Figure 10



Clustering

Transfer of Development Rights

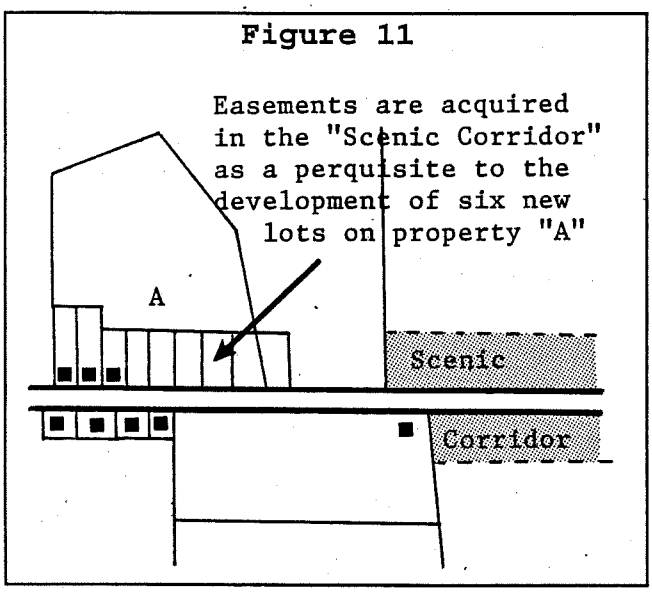
In its most orthodox form, the transfer of development rights is a very difficult concept to administer. It involves sending districts, receiving districts, and a complex series of development credits. The basic idea is that development rights in an area that a community might wish to preserve are bought and then transferred to an area of the community where development is encouraged. The technique is generally used in conjunction with very large lot zoning districts that otherwise preclude any development within the rural, sending districts. While the concept sounds simple enough, it has proven to be a cumbersome process because in addition to the administrative complexities, there needs to be a strong market at work to provide incentives for selling development rights.

In a small, rural community such as Greenwich Township, where the development pressure is rather modest, the classic form of TDR is probably not going to be successful. However, the Township may wish to consider a variation of this concept that could help to encourage the traditional pattern of village development present in the community.

In this instance, a given density would be established within the boundaries of a village. The property owner would have the right to develop at that density. Because one of the Township's goals might be to encourage development in and around existing villages, the property owner might be able to double the maximum density if development easements equaling the number of additional units were secured from a designated area outside of the village boundaries.

Figure 11 provides a hypothetical example of this concept. *(The example is not intended to reflect development densities for Greenwich Township. It is presented only to help explain the concept.)* The owner of the property shown in this figure has the right to subdivide for three buildable residential lots. However, the owner wishes to subdivide six additional lots. In order to do this, the Township would require the property owner to obtain development easements on property outside the district in the area labeled "scenic corridor" that would be deemed equivalent to the proposed additional six lots. This equivalency would be prescribed by ordinance. In this example, rather than trying to fashion the market through an administrative or bureaucratic formula, the Township would allow landowners to fashion their own real estate agreements. Should the Township wish to implement this type of arrangement it would be done using an overlay zone in the municipal zoning ordinance.

Figure 11



Historic Extension Districts and Performance Criteria

The Township's Master Plan and zoning ordinance identify separate areas for the various types and densities of uses that can occur within the Township. The villages of Othello and Greenwich are targeted by the zoning ordinance for historic preservation but as **Map 16** shows the Historic District in the Township's zoning ordinance only covers a portion of the National Register Historic District. Springtown, currently not included by either the township zoning ordinance or the National Register for historic preservation, should also be targeted.

Adjacent to the historic district zone the land is proposed within this Master Plan as historic extension to cover the remainder of the National Historic District. New development within the extension area is encouraged to follow traditional development patterns and designs. The Township should also establish performance standards and incentives to encourage new development to locate within the historic extension area in ways that would not adversely impact on the character of the Historic District. Performance standards and incentives can be used to encourage this pattern of growth by rewarding land owners with increased densities, (density bonuses), and other types of development incentives for "performing" this development according to the goals of the Township Plan.

Land Acquisition and Variations

If the Township was to pursue establishing a greenbelt around the existing villages or along streams or other natural features, a way to secure its establishment would be to acquire property or property rights. There are several ways this can be done. Fee simple purchase of property by a land trust, conservation organization or public entity such as the State is one way. Then the State or conservation agency would own the land and ensure its permanent conservation.

There are also alternatives to the outright purchase of property, such as easement purchase and the placement of deed restrictions. An easement is a property right that is removed for a specific purpose. In the County's farmland preservation program, agricultural easements are placed on farmland to remove the development rights. The farmland owner sells the easements at a fair market price but continues to hold title to the property. The right to develop the property is transferred but not the fee simple title to the property. Deed restrictions are another way to protect property. Deed restrictions, however, are easier to break than easements

which are usually held by a third party. Deed restrictions are often voluntarily included at no cost as part of the deed by the property owner. Easements too, can be acquired for no fee through a land owner initiated process. The Township may wish to consider some aspect of an easement purchase or land acquisition program as part of its historic village and cultural landscape preservation efforts.

Summary

The historic element of Greenwich Township is much more than just a collection of old buildings; the entire setting is historic. Preserving the unique historic character of the community begins with recognizing the interrelationship between the historic district and the cultural landscape. Infill development in the villages should follow traditional, historic patterns of design and setbacks . The site plan and subdivision standards should incorporate those patterns for adjacent development as well. The surrounding countryside should be buffered from development and remain in its rural state, through a combination of rural design standards, farmland preservation programs and possibly open space acquisitions and easements. The scenic views of the cultural landscape may warrant national designation.

The ultimate pattern of proposed, future land use, and the combination of land use tools to achieve the vision of the community will depend upon a consensus reached by the planning board, other agencies and the citizens of Greenwich Township.

Bayside Tract

The purpose of this section is to present background information and the Township's vision for the future use and management of the Bayside Tract.

The Bayside Tract (**Map 17**) is a unique area where the upland area extends to within 2,400 feet of the Delaware Bay. Elsewhere in the county typically a mile or more of wetlands separates upland areas from the Bay. The relatively close and unique access that the Bayside Tract provides to the Bay has given that site a history of being developed, abandoned and proposed for development again.

Development proposals for the tract have ranged from a sturgeon fishery with rail service that was actually constructed in the late 1800's and later abandoned, to a proposal to site a nuclear reactor. That last proposal, while it never materialized, resulted in the Bayside Tract being owned by a consortium of electric power companies and zoned for industrial uses.

Now in the mid 1990's the prevalent feeling is that the Bayside Tract and its existing, traditional land uses should remain undisturbed. The tract contains farmsteads dating back to the 1700's, some which have fallen in to disrepair or have been totally lost due to neglect but some which are worthy of maintenance and preservation. It also contains one-quarter of the Township's farm acreage and almost three-quarters of the Township's wetlands.

Not able to use the site for industrial purposes, the electric power companies are being required by state permitting agencies to conduct mitigation actives on the tract to compensate for the impact that the lack of cooling towers at nearby nuclear reactors has on fish populations. The state permit requires Public Service Electric and Gas Company (PSE & G) to develop a Bayside Tract Management Plan.

The municipal concern is that the mitigation activities and PSE & G's Management Plan will change and increase public use of the Bayside Tract and ultimately result in a change of ownership without regard for effects on the Township.

Municipal issues include 1) control of public access, parking and trespassing; 2) management of the area for security, litter, and maintenance; 3) limiting use of site to low intensity activities, primarily farming, with limited residential and recreation opportunities such as birding, hunting, and hiking. Therefor, this section of the Township

Master Plan is devoted to specifically to how the Township envisions the Bayside Tract's future land use.

Natural Setting

The Bayside Tract's natural setting on the Delaware Bay has continually been a luring factor for development proposals. However, its specific natural features are environmentally sensitive and valuable only for rural development. As indicated by the following natural features, the site has little ability to supply potable freshwater or to assimilate wastewater from septic systems to any great degree. Almost any new development would disrupt wetlands, farmlands or woodlands.

Location: Southern and western portion of Township adjacent to Stow Creek and Delaware Bay.

Boundaries: Bordered by Raccoon Ditch on north; Delaware Bay and Stow Creek on west; Tindall Island Road on east; Cohansey River on south.

Size: About 4,500 acres

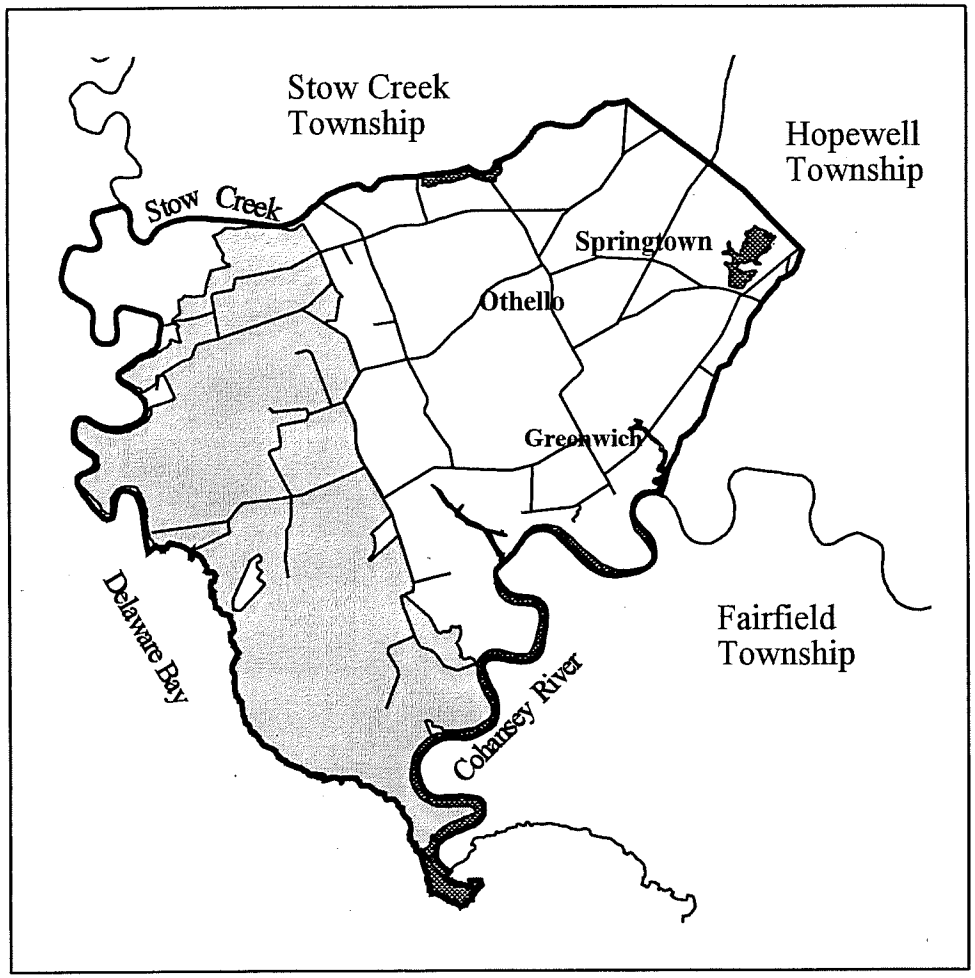
Soils: Large farm areas are Mattapex (MrA, MrB). Small patches of Hammonton (HbB, HbA) along with minor amounts Fallsington, Sassafras and Matapeake (Fd, SrB, MoB) are also farmed on the northern edge of the tract adjacent to the wetlands of Raccoon Creek. These are mostly class II soils. Wooded areas are underlain by Othello (Ot). Large, expansive areas of Tidal Marsh (TM) separate the upland from the Bay. All the soils on the tract have severe septic limitations due to a shallow groundwater table.

Topography: The landscape is flat with less than a 5 % slope. The high point is an elevation of 24 feet above mean high sea level at Bacon's Neck. Most of the tract is below 20 feet.

Flood Hazard: The 100 year flood hazard area extends up to about the 10 feet elevation and covers about half of the tract. Most of the upland area is outside the 100 year flood hazard area.

Drainage: The Bayside Tract is drained by Stow Creek, Jacobs Creek and the Cohansey River, all which flow to the Delaware Bay. The tract contains the entire Jacobs Creek Basin and more than half of the Township's portion of the Stow Creek basin.

Bayside Tract



0.5 0 0.5 1 1.5 2 Miles

N

Bayside

Greenwich Township
Cumberland County, NJ

MAP 17

Groundwater: The groundwater table is within 4 feet of the surface and within one foot over much of the area. The potential for salt or brackish water in groundwater supplies increases with closeness to the Bay.

Vegetation: Tidal marsh, cultivated and open fields, and small parcels of woodland vegetation cover the tract.

Cultural and Historic Resources

The Bayside Tract is unique in terms of its cultural and historic resources. While it shares the same historic period with Greenwich village, the Bayside Tract has experienced a different and less favorable setting for historic preservation. Unlike the Historic District of Greenwich village, the historic homesteads and structure are sparsely scattered over a large undeveloped area with no concentration. However these homesteads and structures, along with the farm fields, have remained the primary development features on the landscape. They have not been replaced or disrupted by newer development, and have simply fallen victim to the ravages of time and weather through the neglect and abandonment of absentee ownership.

As the data in **Table 16** shows the Bayside Tract has practically no development.

TABLE 16

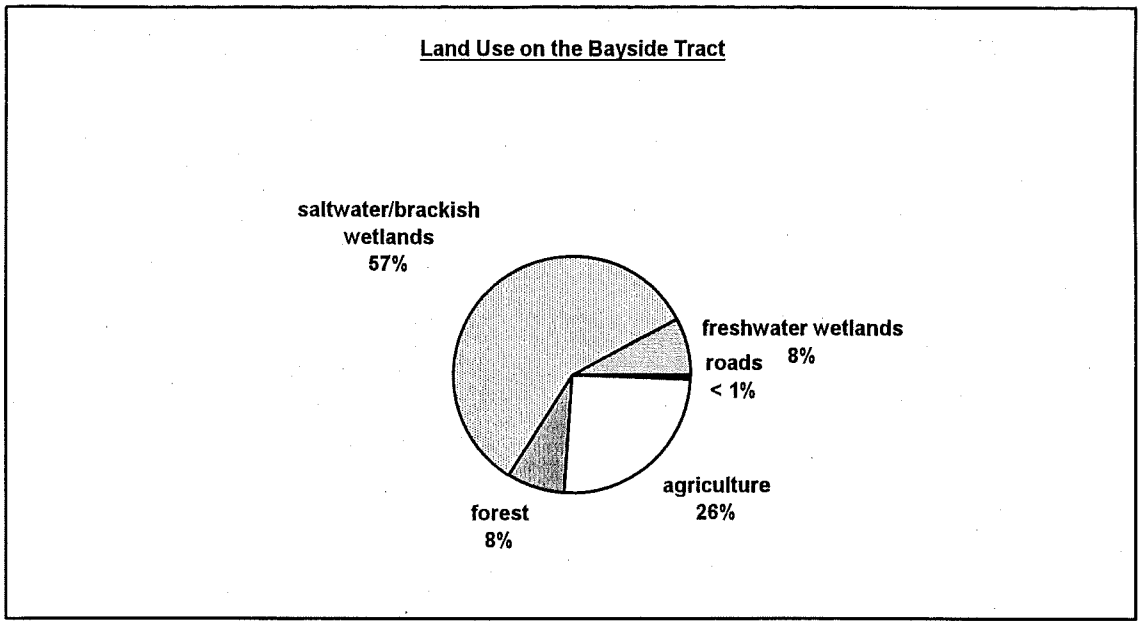
Bayside Existing Land Use / Land Cover:

roads	30	acres
cropland	1,130	
other ag.	2	
forest	353	
estuarine wetlands	2,570	
freshwater wetlands	340	
TOTAL	4,425	

from PSE&G Bayside Management Plan

The following **Figure 12** pie chart further emphasizes the undeveloped nature of the Bayside Tract by showing that wetlands and woodlands cover over 70 % of the area, and added with agriculture, those three uses cover over 99 % of the area.

Figure 12



Farming: Agriculture is the only economic activity that occurs on the upland portion. Significantly, it is responsible for about one quarter of the Township's agricultural output, or an estimated $ 1 million in agricultural product value. Farming is considered the highest and best use of the Bayside Tract.

Parcel patterns: The tract consists of 4 entire tax blocks and part of another.

block	lot	acreage
23	1	144
24	1	255
25	1	3,726
25.01	1	240
15	8	31
		4,396 total

Within the tract there are about six small out parcels covering less than 50 acres.

Residential Use: Residential use is not shown in the land use data because it covers an insignificant amount of land, with only three or four inhabited or habitable dwellings and no more than a dozen people living there. The tract is not subdivided into building lots. However, the farm homestead sites are very important as cultural and historic resources and should be the site of any future residential use on the tract.

There are 10 homestead sites with dwellings and farm buildings in various states of repair ranging from ruins to very good. These sites are the following:

Samuels / Brooks / Bacon House*
Durham / Bacon House*
Roork / "Mortar Brick" / Ware House*
Austen / Bitters House*
Morris Goodwin / "Buttonwood Farm" House*
Wurzel / Erbaugh / McHahan House
Lothman / Capt. Miller / Compton House
Hymer / Pierce / Watson / Johnson House
Walker / Snitcher / Bacon House
Counsellor / Davis / McAllister House*

* *May be eligible for National Historic Register.*

Historic Resources: Five of the homesteads as noted may be eligible for the National Historic Register, dating back as early as 1725 through the early 1800's.

Cultural Landscape: The tract is part of a larger rural historic landscape encompassing Bacons Neck and Stathems Neck areas of western Greenwich Township.

Water Access: It has public, scenic access to Delaware Bay and the marshes via a an observation tower at end of Bayside Road. Small boat launching also occurs here and at the end of Goslin Road though ramp facilities are unimproved and not maintained. Other possible access points to the Cohansey River are at ends of Ragged Island Road and Tindall Island Road but neither is currently open to the public.

Roads and Infrastructure: The tract is served by local and county collector roads. The only other infrastructure is electricity and telephone. There is no public water or sewer service in the region.

Current Zoning: The area north of Goslin Road, Tappan Lane and Wetherill Road is zoned GI - General Industry with a 500 ft buffer along the inland border. A small section at the end of Wheaton Rd along Stow Creek is zoned CR - Commercial Recreation. The southern half of the Tract is zoned R-A - Residence Agriculture.

Bayside Land Use Policies

This section uses the preceding background information on the natural, cultural and historic resources to formulate planning objectives and land use policies for the Bayside Tract. The Bayside Tract has three major physical features that should be planned for: 1) farmland; 2) historic home sites and structures, and 3) public access to the Bay, both scenic and physical.

Objectives

There are five municipal planning objectives for the Bayside Tract:

1. allow only uses and designs compatible with the remainder of the Township;

2. continue farming;

3. place land back on the tax rolls as private property;

4. preserve historic homesteads and structures;

5. prevent new residential development and its accompanying burden on municipal services, other than replacing existing, irreparable homesteads.

Land Use Policies and Recommendations

The following policies and recommendations are intended to meet the municipal planning objectives.

Farmland: Farmland should be preserved as presented in the Farmland Preservation section of this Master Plan. Farming is encouraged to continue on the Bayside Tract as privately owned, owner operated farms. The large contiguous parcel pattern should be maintained for farming.

Public Uses: The woodland, open field and tidal marsh not under private ownership or use should be devoted to open space uses such as bird watching, hunting, water access and hiking. The water access should be primarily oriented to scenic views and the existing access points for launching cartop and small trailer boats at the ends of Goose Goslin Road and Bayside Road. Land devoted to associated uses such as parking and information distribution should be limited to the minimal amount required and placed on upland areas.

Management and maintenance, including litter pick-up, policing, snow removal, and parking controls, at the areas subjected to public use, should be the responsibility of the property owner.

Zoning: It is recommended that the General Industry (GI) zone be completely eliminated and replaced with a rural, conservation or open space type zoning. The zoning should be consistent with the Rural Historic future land use designation presented in this Master Plan. The zoning should hold agriculture as the highest and best use and possibly allow residential use of existing and rebuilt dwellings as a conditional use under historic preservation guidelines.

Residential Potential: Residential opportunities should be limited to the 10 homesteads sites previously listed. Where possible, existing structures should be rehabilitated and used. The homesteads should be restored as private, owner occupied residences with deed restrictions to maintain the historical context of the structures and property. These sites should be subdivided from the rest of the tract following natural features and historic lot lines at lot sizes necessary for proper septic system operation.

Summary

The Bayside Tract is the largest cohesive landscape currently under single ownership in the Township. It can be viewed as being dormant since 1970. During this time its natural, cultural and historic contributions to the Township as a whole have gained appreciation, even as some of those resources fell into disrepair.

Now the situation has arisen where the future of tract is again at issue. The natural and environmental features argue against any new or increased development. This is complimented by the tract's extensive agricultural base, within an agricultural community, which forms a natural target for farmland preservation activities.

The most pressing and difficult issue is preserving and rehabilitating the historic farm homesteads. In order to preserve the landscape and to focus attention, time and resources on the homesteads, their rehabilitation should be the only allowed residential opportunity on the tract. The homesteads should be subdivided from the rest of the tract along existing landscape features where possible to create

opportunities for privately owned, owner-occupied, historic dwellings.

The remaining woodlands and wetlands, while available for public use, should not be promoted for intense use that would place burdens on the natural capacities and municipal resources.

Farmland Preservation

It is the intent of this Plan to encourage the long term continuation of farming as the primary land use and economic activity within Greenwich Township.

Agriculture represents the single largest land use and economic activity in the Township. It covers 4,385 acres or one third of the land area (**Map 18**), and has a product value of perhaps $ 5 million dollars . Therefor the future landscape and economics of the Township will be determined to a large degree by the future of farming. A stable farm base is the most important factor for overall stability and preservation of the community at large. Additionally, agriculture needs very little in the way of municipal services. Conversely a declining farm base could lead to widespread changes in the character of the community, a loss of historical and natural resources and increased demands for municipal services.

Farming is first and foremost an economic activity and the most effective way to maintain the farmland base is to have a strong market for agricultural products. Farming must be profitable to survive long-term. In addition, incentives can be granted to encourage farming as a land use. At the state level the N.J. Farmland Assessment Act of 1963 provides property tax breaks for farm acreage that meets minimum criteria. At the municipal level the Township's Zoning Ordinance lists farming as a permitted use in designated zones and prohibits other land uses that would conflict with farm operations. However property taxes and zoning represent only a portion of the problems faced by farmers. Land equity is also a concern to farmers. As as the value of farmland becomes more value for nonfarm development, the likelihood of farmland being sold and developmed increases.

The most active and effective incentive currently available to Greenwich Township farmers is the Farmland Preservation Program administered by the Cumberland County Agriculture Development Board under the authorization of the N.J. Agricultural Retention Act of 1983. In this program a farm owner can voluntarily place a deed restriction on qualifying farm acreage in return for cash payments, soil and water conservation grants and preferred treatment as a land use. The advantages of this program are that 1) it has support from the state, county, and municipal level of governments, the general public and the farm community, 2) the farm and farm operations remain in private ownership, and 3) nonfarm development potential is permanently removed. Another benefit is that the farms become eligible for soil and water conservation grant projects. Given the large volume of irrigation water used by

- **Adopt development ordinances for the farm areas that require and encourage large lots in keeping with existing farmland patterns.**

Nonfarm development in agricultural areas should be clustered to maintain large, contiguous areas of farmland. Decreases in gross denisities and minimum lot sizes should be considered. Subdivision lot lines should be able to follow hedgerows and other landscape features. Nonfarm development must be provided for even within agricultural zones but the amount of land area required to be devoted to nonfarm uses should be minimal. In addition to preserving farmland, clustering development has added benefits of conserving energy and and being less expensive to provide community services and infrastructure. Ordinances for zoning, site plans and subdivisions should specifically identify farmland as a landscape feature to be conserved.

Housing Element

The Municipal Land Use Law requires municipal master plans to contain a housing element addressing present and prospective housing needs and access to affordable housing. Of particular concern to the Township is that the population has access to housing opportunities that match the environmental and historic resources of the community. It is the intent of this Master Plan to provide the opportunity for low and moderate income housing to occur within the existing context of the Township.

The Council on Affordable Housing and Housing Need

The Council on Affordable Housing (COAH) is the state agency responsible for guiding municipal activities on affordable housing. **COAH has calculated a need of 19 affordable housing units within Greenwich Township for the time span of 1993 through 1999**. This was calculated by COAH using information on housing costs, income levels, deteriorated housing, demolitions and regional housing conditions. COAH also identified 18 deteriorated units. The rehabilitation of six of these deteriorated units would qualify as credit against the need of 19 affordable units

Income Levels and Housing Costs

COAH has also calculated income levels for median, moderate and low income housing. For Greenwich Township and the rest of Cumberland County, as part of COAH Housing Region 6 shown on **Table 17, eligible income levels range from $14,975 as low income for a one person household to $45,181 as moderate income for an eight person household**. Based on COAH criteria, **no more than 30 % of gross income should go towards housing costs** including rent, mortgage, property taxes and utilities.

TABLE 17

HOUSEHOLDS AND AFFORDABLE HOUSING COSTS

household size	income	affordable rent @30%	affordable mortgage
1 person	$14,975	$375	$45,000
4 person	$34,228	$856	$111,000
8 person	$45,181	$1130	>150,000

for COAH Region 6 Atlantic, Cape May, Cumberland and Salem Counties

Affordable housing units are considered to have total monthly costs between **$375** to **$1,130** depending on household size. Affordable housing costs for a family of four with moderate income is considered **$856** per month. This roughly translates into mortgages of somewhere between **$45,000** to over **$150,000** for a 30 year term at 8.5 %, with an affordable mortgage considered to be **$111,000** for a moderate income four person household.

A comparison of the affordable housing costs with the rents and values of owner-occupied housing on the following tables shows that a four person household with a moderate income should be able to afford the median rent or the median value owner-occupied house. In fact over 80 % of the rental units are less than $500, and 60 % of the owner-occupied houses are under $100,000. While these figures do not include total housing costs for electricity, water, sewer, trash disposal and other household costs, they do show that a large proportion of the housing supply in the Township is relatively inexpensive.

TABLE 18

RENTAL HOUSING

contract rent	units
< $250	12
$250 - 499	19
$500 - 749	5
$750 - 999	1
$1,000 or more	-

Median $381

source: 1990 U.S. Census.

TABLE 19

OWNER-OCCUPIED HOUSING

value	units
< $ 50,000	17
$50,000 - 99,999	108
$100,000 - 149,999	52
$150,000 - 199,999	16
$200,000 - 299,000	10
$300,000 or more	4

Median $90,000

source: 1990 U.S. Census.

Of greater concern perhaps than housings costs, is the number of households with low income levels. As shown on the following table of income levels, twenty percent of the households in the Township have incomes below COAH's low income level for a one person household. That percentage increases when larger household sizes are included. Though these households may have adequate housing now, they may have financial problems maintaining that housing or obtaining new housing.

TABLE 20
HOUSEHOLD INCOME LEVEL

household income	number of households	% of households
< $5,000	10	3
$5,000 - 9,999	24	7
$10,000 - 14,999	39	12
$15,000 - 24,999	63	19
$25,000 - 34,999	41	13
$35,000 - 49,999	62	19
$50,000 - 74,999	59	18
$75,000 - 99,999	19	6
$100,000 - 149,000	7	2
150,000 or more	2	1

source: 1990 U.S. Census.

Possible Location of Affordable Housing

The demand for new housing within the municipality has been extremely low and the population of the municipality has basically been static for the last one hundred years. Since at least 1980 an average of two units per year have been constructed. This trend is expected to continue for the next six years. Given the low development pressure and low number of affordable housing opportunities required by COAH, almost any upland area of the Township might have some potential to meet a portion of the affordable housing goal.

Greenwich village is a concentration of existing residential housing but at least an equal amount of housing occurs in the rural countryside. Since over 50 % of the housing stock was built before 1939 and COAH has identified 18 deteriorated units, housing rehabilitation of COAH eligible units should be encouraged anywhere in the Township.

The State Development and Redevelopment Guide Plan designates the Township as rural planning area 4 and environmentally sensitive planning area 5 with three existing villages: Greenwich village, Othello and Springtown. For planning areas 4 and 5, COAH in coordination with the State Planning Commission requires that any new development for affordable housing be located within state plan designated centers. This means that any new COAH eligible housing would have to be built in Greenwich village, Springtown or Othello. Eligible rehabilitation, however, could occur throughout the Township.

The land designated as residential along Routes 620 and 607 in the Future Land Use section of this Master Plan has ample area to accommodate the construction of 19 affordable housing units but only the portion of land within the Springtown village center would be eligible. At this time definite boundaries have not been determined for any of the Greenwich Township centers.

Township zoning allows for the construction of single family homes, including those provided for under the Affordable Housing Act, throughout the municipality. On tracts of fifty acres or more, a minimum half acre lot size is allowed with clustered development. The half acre minimum lot size is based upon the need to provide on-site septic and on-site water supplies in a region with a very high seasonal high water table and a shallow freshwater aquifer. Smaller lot sizes would create potential health and environmental problems. The Township has no central sewer or water system and the rural population density makes providing central sewerage and water economically unfeasible.

Summary and Recommendations

Affordable housing opportunities exist within Greenwich Township as evidenced by rental and owner-occupied housing values. Particularly significant are the number of rental units under $500 per month. Housing opportunities in general are limited only by the rural nature of the Township and environmental constraints of the land. It is important to the Township that all development, including affordable housing, respect the environmental and historical resources. Even with this condition, almost every portion of the Township has potential to provide affordable housing.

The following recommendations are made for affordable housing.

- **Affordable housing should be primarily in the form of single family housing.**

Single family housing is in keeping with the existing, rural character of the community and allows affordable housing units to blend in with the surroundings. There are enough relatively low value properties that make this a realistic housing option. This in no way precludes other housing types that specific situations may lend themselves.

- **Rehabilitation has preference over new construction.**

The number of vacant and deteriorated units within the Township exceeds the COAH obligation of 19 affordable housing units. Rehabilitation should have priority over new construction, especially in light of the lack of development pressure.

- **Limit new construction to infill development within Greenwich village, Springtown and Othello.**

Under the State Development and Redevelopment Guide Plan Greenwich Township is designated as planning areas 4 and 5 with the three centers . COAH and the State Plan Commission require that new construction for affordable housing opportunities in these planning areas be located in centers.

- **Coordinate affordable housing activities with historic preservation.**

Affordable housing and historic preservation are both desired goals. However, they have the potential to counter-act or obstruct each other if they are not coordinated and applied with sensitivity to the surrounding community. At the same time the financial resources for both activities are limited. By joining forces to provide affordable housing within a historical setting both the affordable housing and historic preservation interests can extend their resources and possibly gain broader public support for their programs.

Because of differences in their requirements, individual financial records would have to be kept to separate eligible affordable housing costs from historic preservation costs. In order for a municipality to receive credit for affordable housing, rehabilitation must involve a minimum of $10,000 per

unit to bring the unit up to standards. Therefor the minimum cost for rehabilitating the total COAH obligation of 19 units for credit, if possible, would be $190,000.

- **The Township should actively identify, monitor and solicit funding for housing rehabilitation.**

The Township should assist low and moderate income families by finding and applying for grants and loans to be used for rehabilitation work. Potential funding sources include the N.J. Department of Community Affairs, U.S. Department of Housing and Urban Development, Farmers Home Administration, nonprofit housing groups and the banking industry.

- **File a copy of this Master Plan with COAH.**

The Township should file a copy of its adopted Master Plan contain the housing element with COAH. Filing the plan gives the municipality two years of protection from exclusionary housing lawsuits. Instead, any litigation is referred to COAH's administrative review; a process that is less costly and time consuming than having the Township defend itself in court.

Relation to Other Plans

Greenwich Township's Master Plan does not exist in a vacuum. Land uses and planning activities in the surrounding municipalities and at other levels of government have direct bearing on Greenwich Township. In accordance with the Municipal Land Use Law (NJSA 40:55D-28.d) this section reviews the relationship of this Master Plan to the master plans, policies and regulations of contiguous municipalities, the county master plan, the State Development and Redevelopment Guide Plan, and the N.J. Department of Environmental Protection.

The effectiveness of Greenwich Township's Master Plan depends, to a degree, on compatible land use planning within the neighboring Townships of Hopewell, Stow Creek, and Lower Alloways Creek. Similarly, State and County activities affect Greenwich Township's land use. Thus, the Township must plan within the constraints of State and County activity and at the same time work with its neighbors to achieve compatible land use.

State Development and Redevelopment Guide Plan

The New Jersey State Development and Redevelopment Guide Plan, prepared by the Office of State Planning and the State Planning Commission and adopted by the State in 1992, shows areas of the State where growth would be appropriate and areas where development should be limited. The plan is to be used as a guide for public investments such as sewers and highways that generate growth. The plan's basic policies are to protect the state's ecosystems, concentrate rather than disperse the pattern of residential, commercial, industrial, and resort-oriented development, and encourage the preservation of open space. In the coastal areas of the state the State Plan is implemented by NJ Department of Environmental Protection through the Coastal Zone Management Program and the regulations of the Coastal Area Facility Review Act. The State Plan land use policies place Greenwich Township within Planning Area 4 (Rural) and Planning Area 5 (Environmentally Sensitive) with three designated existing villages: Othello, Springtown and Greenwich.

The Township Master Plan and the State Plan agree on designating most of the active farmland for continued agricultural use and by leaving the wetlands undisturbed. Both plans further agree by recommending only rural residential densities. The Township Master Plan, moreover, anticipates that State regulatory and investment policies

limit growth in the agricultural portions of the State. Therefore, the Greenwich Township Master Plan expects that the Township will remain a rural community compatible with Planning Areas 4 and 5 of the State Plan.

The village boundaries for Greenwich, Othello and Springtown have not been mapped and the Township should be actively involved with designating the village boundaries.

State Regulation

The N.J. Department of Environmental Protection regulates wetlands and coastal development within Greenwich Township.

Wetlands: The Wetlands Act of 1970 and the Freshwater Wetlands Protection Act of 1978 require state review and approval for any activity that drains, dredges, excavates, or erects a structure in wetlands. These laws severely limit development and disturbances in Greenwich's tidal marsh.

Coastal Area Facilitates Review Act: All of Greenwich Township's land area is under the jurisdiction of the Coastal Area Facilities Review Act (CAFRA). The Department of Environmental Protection delineates CAFRA's boundaries and administers its regulations. Within Greenwich and the rest of the CAFRA area, a permit from DEP is required for the construction of housing developments containing twenty-five or more units, all industrial and public development, and commercial development with 50 or more parking spaces. Within a zone covering all land within 150 feet of the mean high water line the development thresholds are lower. A NJDEP permit is required for the first development from the water line, three or more residential units, and commercial development with five or more parking spaces. In addition, CAFRA review is required for all State funded transportation and sewer improvements.

As a guide for approving development proposals within the CAFRA zone, the DEP uses the policies from the State Development and Redevelopment Plan. Because much of Greenwich is characterized by moderate to highly sensitive environmental factors (wetlands, fertile soil, high water table, historic sites, etc.) and low development potential (lack of sewers, no public water, few commercial facilities, no railroads, etc.), the NJDEP can be expected to be very restrictive in reviewing and approving development proposals that conflict with the coastal strategy or encourage extensive development in Greenwich.

Cumberland County Plans

Cumberland County plans relating to land use date back to **The Cumberland Plan**, 1966, followed by various addendums, updates and reports, including the county's cross-acceptance activities for the State Development and Redevelopment Guide Plan and county ecological planning activities.

Of special note, as early as 1966 County plans showed stream conservation greenbelts for Stow Creek, Raccoon Ditch, Pine Mount Creek, Sheppards Mill Pond, and the Cohansey River. This designation in Greenwich Township continues to be supported by local and county planning objectives.

The County's **Rural Water Plan**, 1969, projected that Greenwich village would need a community water supply system by 1979 with a proposed wellfield north of Springtown and observation wells proposed around the Bayside Tract. In part, that need for a community water supply anticipated industrial development on the Bayside tract. Bayside is no longer planned for industrial development, and as of 1995 a community water supply has not been put in place. However the proposal for a community water supply still remains valid for consideration. An observation well has been drilled though not at Bayside.

The County's **Farmland Preservation Program,** administered by the Cumberland County Agriculture Development Board, has received much attention from Greenwich Township farm owners. This program has the potential for a high level of participation, perhaps more than 50 % of the farm acreage within the Township. Participation in the program helps maintain the Township's agricultural economy and also helps attain the Township goals for historic and cultural landscape preservation.

Cumberland County is also involved with the **Delaware Estuary Program**, a multi-state planning effort to balance development with environmental protection within the Delaware Estuary. The County recognizes the agricultural, ecological and cultural value of Cumberland County's bayshore communities including Greenwich. Findings of a Cumberland County study include the need for revisions to the State's payment in lieu of taxes program to offset the municipal loss of revenue resulting from land conservation. It also gives special mention to the Bayside tract as an "Area of Special Significance" for rare, threatened and endangered species habitat and that it is important for agriculture to continue.

The County's **Traffic and Transportation Plan Update**, 1991, has no planned roadway projects for Greenwich Township. Unlike

past transportation plans there is no mention of any proposed bridge crossings over either the Cohansey River or Delaware Bay. It did not identify any high accident rate intersections or congested County roads. Of special note is objective # IV. "ENVIRONMENTAL IMPACTS MUST BE AN INTEGRAL CONSIDERATION IN THE TRANSPORTATION PLANNING PROCESS," which also encompasses quality of life and community enhancement. It is important to the Township that road projects, including routine maintenance, respect the aesthetics of the area.

Cohansey River Basin Wastewater Management Plan

Under this 1994 plan for the Cumberland County Utilities Authority's wastewater management activities, Greenwich Township is designated as an area that will continue to rely on subsurface sewage disposal systems. The Wastewater Management Plan notes that the Township's rural population density does not warrant the extension of sewer service, and individual disposal systems would continue to be an adequate means of waste water management through the year 2010. Any development generating more than 2,000 gallons of wastewater per day must be amended to the Wastewater Management Plan on a case-by-case basis.

Municipal Master Plans and Zoning

Greenwich borders on four municipalities: Fairfield, Hopewell, and Stow Creek Townships in Cumberland County, and Lower Alloways Creek in Salem County. All are rural communities and no land use conflicts are anticipated to occur with any of these municipalities. Greenwich also participates on the **Cohansey River Planning Committee**, a group that also includes representatives from Cumberland County, Bridgeton, Fairfield Township, Hopewell Township, business interests and environmental interests.

Fairfield Township

On Fairfield Township's Future Land Use Map, 1978, the tidal wetlands along the Cohansey River across from Greenwich Township are designated floodplain backed by state-owned open space. A small areas of uplands with river frontage at Lanings Wharf is designated for industry. This is identical to Fairfield Township's Zoning Map, 1978. From Greenwich Township's perspective industrial development on this land would not be appropriate.

Hopewell Township

The Hopewell Township land adjacent to Greenwich Township is important because it contains the headwaters of Mounce Creek and Sheppards Mill Pond. The Hopewell Township Master Plan, 1977 - 1978, shows the stream corridors as flood plain and conservation areas, and the upland portions as agriculture. A small historic area is also noted. The Hopewell Township Zoning Map, 1977, zones that area as agriculture.

Stow Creek

The adjacent land in Stow Creek Township is zoned floodplain and agriculture with a nearby historic area designated in Roadstown. No change in land use is anticipated.

Lower Alloways Township, Salem County

The land across the Stow Creek in Alloways Township is mostly floodplain and tidal marsh within the state's Mad Horse Creek Wildlife Management Area.