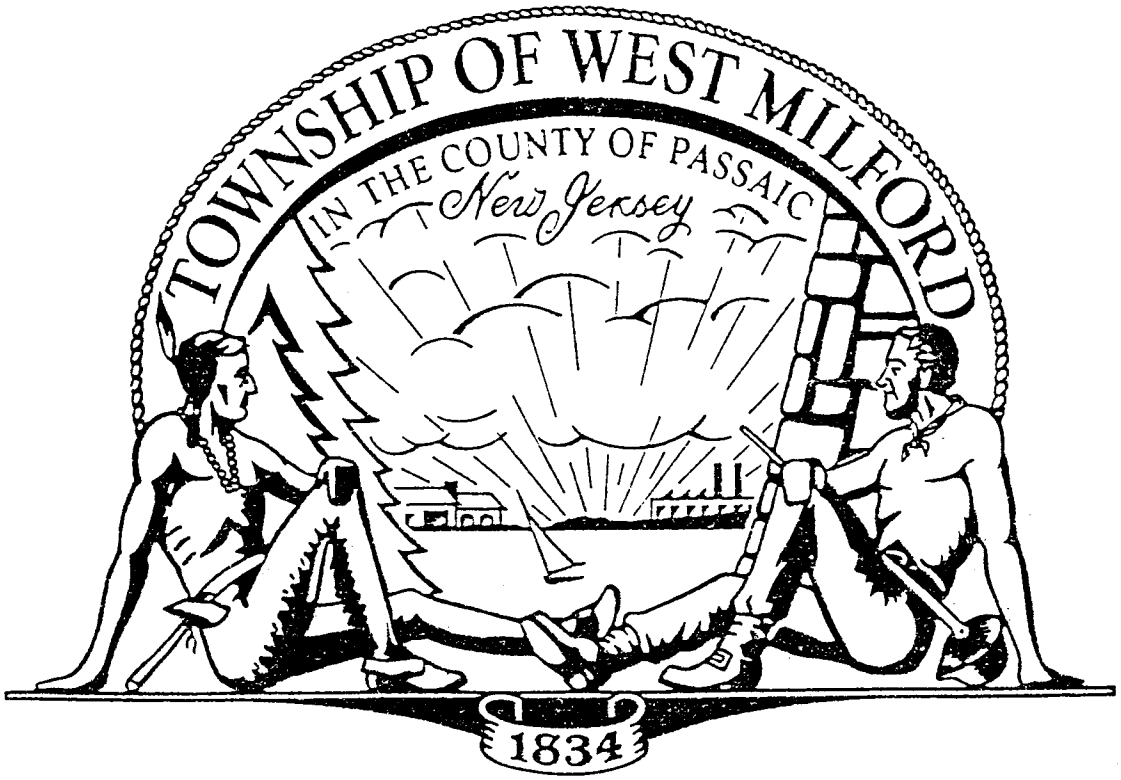
West Milford Township



Master Plan

RE-EXAMINATION REPORT

MASTER PLAN

TOWNSHIP OF WEST MILFORD

MAY 28, 2003

West Milford Township Planning Board

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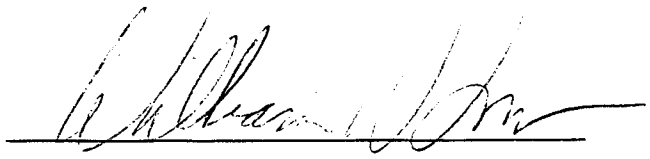
Prepared by:

Township of West Milford Planning Department

William H. Drew, P.P., Township Planner

Linda M. Lutz, P.P., Principal Planner

(The original document on file in the Planning Department has been appropriately signed and sealed in accordance with N.J.S.A. 45:14A-12)



William H. Drew, P.P. 03971

INTRODUCTION

PURPOSE OF RE-EXAMINATION

Numerous issues have recently arisen within the Township and State planning process that directly relate to the Township Master Plan. The Planning Board has been conducting re-examination studies for two years for the purpose of preparing a new Master Plan. This report will serve to re-examine the Master Plan in accordance with the Municipal Land Use Law as outlined in C.40:55D-89, and also serve as a progress report concerning preparation of the new Master Plan.

The Municipal Land Use Law requires that every Municipality conduct a periodic examination of its Master Plan at least every six years, but the statute does not preclude a more frequent examination. The Township Planning Board last re-examined its Master Plan and adopted a Re-Examination Report on October 27, 1999.

It should be stated initially that the Planning Board recommended, at the conclusion of its 1999 re-examination, that a new Master Plan be prepared. In 2000, the Township Planning Department secured a $125,000 Smart Growth Grant from the Office of State Planning (now known as the Office of Smart Growth) to assist the Board in conducting extensive public meetings and visioning sessions to elicit a broad spectrum of input on the public's future vision for the Township. The process was initiated and designed by the Planning Board, which fully intended to see the project to fruition. However, the Township Council intervened, hired its own consultant and established a separate committee (the Smart Growth Committee) to undertake the process. That committee excluded the Planning Board from its process. The grant deadline expired December 31, 2001, but has been extended by the State for 18 additional months. The results of the Smart Growth process and report have not as yet been forwarded to the Planning Board. In fact, there have been no communications from the Smart Growth Committee to the Planning Board throughout the Committee's process.

Accordingly, because of the delay in the delivery of those findings that were to come from the Council's Smart Growth Committee, the Board determined that a re-examination at this time would facilitate its own Master Plan process.

The Planning Board has undertaken its own studies in anticipation of adopting a new Master Plan. This report identifies the progress made to date and provides a timetable for addressing pending issues, which are partially a result of the Master Plan studies. It should be understood that the Planning Board has every intention of reviewing and incorporating the relevant findings of the Smart Growth study into its Master Plan, should they be forthcoming. The delay in that study, however, may extend

the completion of the Board's Master Plan, which further necessitates this re-examination report.

The Board's Master Plan process has involved many volunteer hours by Planning Board members, along with members of the Environmental Commission and the general public to complete the analysis necessary to prepare a new Master Plan. This re-examination will highlight the results of their efforts to date and outline an anticipated schedule for completion of the new Master Plan.

RE-EXAMINATION PROCESS

The Municipal Land Use Law requires a Master Plan be examined against five criteria.

I. The major problems and objectives relating to land development in the municipality at the time of the adoption of the last re-examination report.

II. The extent to which such problems and objectives have been reduced or have increased subsequently.

III. The extent to which there have been significant changes in the assumptions, policies and objectives forming the basis for the Master Plan or development regulations as last revised.

IV. The specific changes recommended for the Master Plan, if any, including underlying objectives, policies and standards, or whether a new plan or regulations should be prepared.

V. The recommendations of the Planning Board concerning the incorporation of redevelopment plans adopted pursuant to the "Local Redevelopment and Housing Law," P.L. 1992, c. 79 (C.40A:12A-1 et al.) into the land use plan element of the municipal Master Plan, and recommended changes, if any, in the local development regulations necessary to effectuate the redevelopment plans of the municipality.

The following is an analysis of the current Master Plan and its re-examination in accordance with the above criteria.

I. The major problems and objectives relating to land development in the municipality at the time of the adoption of the last re-examination report.

A. Problems

1.) The problems identified in the 1987 Master Plan were:

- Septic capabilities.
- Potable water supply.
- Development increases.
- Watershed responsibilities.
- Other environmental constraints.

2.) The problems identified in the 1993 Re-Examination Report were:

- Slow real estate market.
- Lack of clarity concerning permitted recreation uses and standards in the Township Development Ordinances.

3.) The problems identified in the 1999 Re-Examination Report were:

- Increased development pressure from revitalized real estate market.
- Loss of tax revenue through State purchase of land.

B. **Objectives**

1.) The objectives identified in the 1987 Master Plan were:

- To preserve the semi-rural character of the Township.
- Preserve the pristine nature of the forest, waterways and sensitive areas.
- Encourage growth that will minimize impacts on air and water quality.
- Encourage a pattern of land use that will provide reasonable residential, commercial and industrial land use consistent with the character of the Township.
- Promote active recreational opportunities on both public and private lands and in the area of public lake areas.
- Encourage energy conservation of scarce fossil fuels.

- Improve circulation patterns throughout the Township for through-traffic and local traffic demands to residential and commercial land uses.

- Provide municipal and social services to meet the demands of the existing and future population and to achieve efficiency in the administration of these services.

2.) The objectives identified in the 1993 Re-Examination Report were:

- Identify centers and infrastructure needs.

- Prepare a comprehensive recreation Master Plan addressing public and private recreation needs.

3.) The objectives identified in the 1999 Re-Examination Report were:

- Prepare a new Master Plan using as its basis the Center Designation Report.

- Amend the development regulations within the Redevelopment District to incorporate the regulation of Ordinance 1997 – 21 providing for recreation uses.

II. The extent to which such problems and objectives have been reduced or have increased.

The Problems and Objectives will be separated for purposes of clarity.

A. **Problem**	**Extent to which problems have been reduced or increased.**
1.) 1987 Master Plan problems:	
Septic capabilities	have gotten worse because there has been more development.
	have gotten worse because as septic systems age and are not maintained, potential for failure or pollution increases.
Potable water supply	recent trends indicate drier years.
	more people are tapping groundwater.

Increase in Development	Since 1987, a total of 437 lots have been created through subdivision approval. A review of subdivision activity relative to the Master Plan Re-Examination reports reveals that:	
	between 1987 and 1992	66 lots by virtue of Minor Subdivision
		110 lots by virtue of Final Major Subdivision
	between 1993 and 1999	37 lots by virtue of Minor Subdivision
		165 lots by virtue of Final Major Subdivision
	between 2000 and January 1, 2003	19 lots by virtue of Minor Subdivision
		40 lots by virtue of Final Major Subdivision
	In addition, 507 adult residential condominiums have been approved for development and 39 fee simple townhomes.	
	Since September 1992 (when building permit records are first available) 817 Certificates of Occupancy have been issued through January 1, 2003 for new residential units. (see Appendix 4)	
Watershed Responsibilities	State has been acquiring land/easements.	
	State is developing a water quality approach to land use	
Other envir. constraints	private developable land is becoming more scarce with the more difficult land remaining.	

2.) 1993 Re-Examination Report:

Slow real estate market	fluctuates – This is a cyclical market condition. A review of the number of new house building permits issued identifies trends over the past 16 years.

3.) 1999 Re-Examination Report:

Loss of tax rev. through purchase of land by State	problem is increasing each time land comes off tax roll.

B. Objective **Extent to which objectives have been reduced or increased.**

1.) 1987 Master Plan Objectives:

Preserve semi-rural character	remains at forefront of Township's thinking.
Preserve pristine nature	remains at forefront of Township's thinking.
Encourage growth that will decrease impacts on air and water quality	remains at forefront of Township's thinking.
Encourage a pattern of land use that will provide reasonable R, C, & I land consistent with character of Township	the Planning Department is compiling commercial square footage constructed since 1987 and the Planning Board is currently analyzing the land use patterns under its new Master Plan. there have been 86 use variances decided since 1993. Economic Develop. Committee disbanded by Council. 50 unit Lincoln Hill Center senior housing is under construction.
Promote active recreation opportunities on both public and private lands and in area of public lake areas	ordinance is in place – objective is satisfied. Township acquired West Brook Park, but no active recreation occurs there. PAL building was built/established, which created a recreation facility. Resource Development Committee was established to promote recreation as part of Gateway region
Encourage energy conservation of fossil fuels	commuter increases reduces conservation of fuel; population increase without comparable local employment opportunities.

	park-n-rides improvements in Newfoundland and Hewitt – buses enable some reduction in fuel consumption; sidewalks are provided in some sections in center of Town.
	Cahill Cross Road has been constructed to reduce trip lengths.
	New Jersey Transit opened the expanded park-n-ride facility along Greenwood Lake Turnpike. This provided additional parking spaces.
Improve circulation patterns for through traffic and local traffic demand to R&C land uses	Problems have been reduced by completion of the following projects identified in the 1987 Master Plan – Warwick Turnpike third lane; Marshall Hill Road, Union Valley and Ridge Road intersection improvements; Morsetown Road Cahill Cross Road intersection Cahill Cross Road has been extended from its intersection with Ridge Road to Morsetown Road.
	All other road improvement projects listed in 1987 Master Plan are still pending completion
Provide municipal and social services to meet the existing and future population and to achieve efficiency in the administration of these services	Emergency services: problems have increased due to events of 9-11-01, however: wireless telecommunications ordinance in place; Security at Town Hall is improved; better communications; established Communication Coordinator position; Library: Townspeople voted no on a new library in 1997. Discussions continue and a new location is chosen. There is a conceptual architectural design. Social Services: Senior housing – underway.

III. **The extent to which there have been significant changes in the assumptions, policies and objectives forming the basis for the Master Plan or development regulations as last revised.**

The adoption of the State Development and Redevelopment Plan (the State Plan) in 1992 supported the Master Plan goal to develop in centers. The State Plan provided the policies to define and refine the local Master Plan, which the Planning Board embraced. The Board's 1993 Re-Examination Report set forth the goal to prepare a

center designation report, to submit to the State, in conformance with the State Plan policies and objectives.

This request for center designation was filed with the State Planning Commission in August 1998, and hearings began with the State Plan Implementation Subcommittee in January 1999. The then Office of State Planning made recommendation in May 1999 that the Plan Implementation Subcommittee grant center designation to West Milford Township. However, that subcommittee tabled the recommendation, and the plan is still pending.

In the 1999 Re-Examination Report, the Planning Board recommended the Center Designation Report become the adopted Master Plan. However, some environmental groups and a segment of the Township residents were concerned about the proposed Wastewater Management Plan, which was being considered by the Township Municipal Utilities Authority. They perceived that the associated potential increase in density that would result within the center boundary would have an adverse impact.

Therefore, to further identify the residents' concerns and to establish a clear vision for West Milford and its land use policies, the Planning Board prepared a Smart Growth grant request, which the Township Council endorsed, and submitted to the then Office of State Planning. The Township was awarded a $125,000 grant. The Planning Board received seven proposals from qualified firms that addressed the outlined scope of services and requested deliverables. An interview process was conducted by a joint committee of Planning Board and Council members. The Township Council rejected the recommendation to retain a certain consulting firm from the seven proposals and conducted their own search, resulting in one proposal. The Council retained that firm and established a Smart Growth Committee of resident volunteers. The committee at the outset determined it was to operate independent of the Planning Board, and excluded the Board from actively participating in their process.

The Council's intervention of the Smart Growth process has presented a significant delay in the progress of the Planning Board. The Board has been unable to determine if its established policies and objectives that form the basis of the Master Plan should be reconsidered. This cannot be determined because the Planning Board has not received any information concerning any aspect of the Smart Growth process. Therefore, the Planning Board has undertaken its own initiatives to prepare a new Master Plan which will entail a full public process. The Board also intends to fully review and consider relevant findings and recommendations that may result from the Smart Growth process, when that report is finally submitted to the Board.

A potential change that could significantly affect the Board's assumptions, policies and objectives is "the BIG Map" prepared by the New Jersey Department of Environmental Protection. This map depicts the DEP's suggested growth and non-growth areas of the State. West Milford Township is within the non-growth area. It is not clear what the State's ultimate intent is with regard to its own State Plan and this

new map being displayed by the Department of Environmental Protection. If this represents a new planning direction by the State, it could impact the policies, assumptions and objectives of the Township Planning Board.

The New Jersey Department of Environmental Protection has issued pending regulations in the New Jersey Register regarding stormwater management and stream classifications designed to address water quality throughout the State. These regulations have the potential to significantly change the assumptions, policies and objectives of the Master Plan as well as the Township Land Development Regulations. The Planning Department is currently assessing what the potential impact of the stream classifications and resulting required buffers will have upon the Township.

There are also pending land use issues outlined in Table I involving zone map ordinance amendments and other considerations being discussed by the Planning Board that could impact upon the Master Plan and any amendments that may be warranted.

Another cause for the Planning Board to reassess its assumptions, policies and objectives were the events of September 11, 2001 regarding the Township emergency services. The Planning Board will need to address its wireless telecommunications ordinance and the emergency services and routes. The road improvements recommended in the 1987 Master Plan should be re-assessed and prioritized, in consultation with the Township Engineer.

IV. **The specific changes recommended for the Master Plan, if any, including underlying objectives, policies, and standards, or whether a new plan or regulations should be prepared.**

The Planning Board is currently preparing a new plan. The Board should determine, in the meantime, whether it wishes to make interim amendment(s) after reviewing Table I.

New Master Plan goals and objectives have been outlined and preliminarily have been accepted by the Board (see appendix 1). Subcommittees have been established comprised of Planning Board and Environmental Commission members with the involvement of the High School Science Department. This has resulted in three subcommittees that reviewed Demographics, Natural Features, and Water Quality. Their final reports are attached as appendices 2, 3 and 4. A fourth subcommittee that has not yet convened concerns the lake communities. Also, the Master Plan subcommittee of the Board has begun meetings this spring with the business communities within West Milford regarding Master Plan objectives relating to business needs. The status of the Master Plan progress is attached as Appendix 5.

V. **The recommendations of the Planning Board concerning the incorporation of redevelopment plans adopted pursuant to the "Local Redevelopment and Housing Law," P.L. 1992, c.79 (C.40A:12A-1 et al.) into the land use plan element of the municipal Master Plan, and recommended**

changes, if any, in the local development regulations necessary to effectuate the redevelopment plans of the municipality.

The Planning Board should determine whether to address the redevelopment district within the Board's new Master Plan, or whether an interim change to the current plan is warranted.

Table 1

Pending Issues	**Is it a change in Master Plan policy, assumption or objective? Yes/No**	**If yes, which one and where in the Master Plan**	**If no, is it a Planning Board or Council issue**	**Does Planning Board desire to amend Master Plan**	**Planning Board time line for impleme nting**	**Foot-note for explanati on**
Zone changes Union Valley Rd. R-1 to R-4	Yes	Change in policy, assumption and objectives to Land Use Map #12		Yes	Spring/ Summer 2003	
Union Valley Rd. and Pinecrest Lake R-1/PN to R-4, SHD/R-2 to R-4	Yes	To Land Use Map #12				
Redevelopment District Amendments	Yes			No		
Creating new Business Zone	Yes	Change to policy and objective Goal IV - Objective 1 Land Use Element- Commercial Areas p. 73		Yes	May 2003	
LR Zone minimum lot area reduction	Yes	Change to policy and objective Land Use Element p. 70 Goal III Objective IV		Yes	Summer/ Fall 2003	

Pending Issues	Is it a change in Master Plan policy, assumption or objective? Yes/No	If yes, which one and where in the Master Plan	If no, is it a Planning Board or Council issue	Does Planning Board desire to amend Master Plan	Planning Board time line for implementing	Foot-note for explanation
Lake Commercial Permitted Uses	No		Planning Board discussion on appropriate land use and lake environment			
Cluster Zone criteria and lot averaging concept	No		Planning Board discussion to refine Land Development Ordinance provisions			
Telecommunication facilities	No		Planning Board effort to refine Land Development Ordinance and further Master Plan Goal 8, Objective II			

Pending Issues	Is it a change in Master Plan policy, assumption or objective? Yes/No	If yes, which one and where in the Master Plan	If no, is it a Planning Board or Council issue	Does Planning Board desire to amend Master Plan	Planning Board time line for impleme nting	Foot-note for explanati on
Wastewater Management Plan	Yes	Change in policy, assumption and objective pp. 120-133		Not now		
Certified Housing Element changes	Yes	Change in policy, assumption and objective Housing Element pp. 87, 92 to include community residences as a viable method to address affordable housing need/obligation		Yes	May 2003	

APPENDICES

Goals and Objectives of the Master Plan

Goal I

Preserve and protect the semi-rural and environmentally sensitive character of the Township

Objectives

1. Preserve scenic, cultural, historic, and environmentally sensitive land.
2. Encourage aesthetic, energy efficient and environmentally sensitive site design.
3. Promote farmland preservation through appropriate zoning.
4. Prevent sprawl type development.

Goal II

Preserve contiguous open space

Objectives

1. Limit growth in and protect lands with major physical constraints and critical habitats.
2. Provide suitable land uses on sensitive lands through zoning.
3. Protect existing lakes and waterways from deterioration.
4. Encourage open space by the use of appropriate land use techniques.
5. Identify and implement a greenway network linking privately and publicly preserved lands.

Goal III

Protect water resources

Objectives

1. Consider alternative and technological advancements in wastewater treatment.
2. Provide for methods of reducing storm water runoff and its impact through best storm water management practices.
3. Appropriately zone vacant land adjacent to open bodies of water for minimal development impact.
4. Protect areas of high groundwater recharge value.
5. Protect stream corridors.

Goal IV

Land/Use and Growth Management

Objectives

1. Focus growth around existing business districts, encouraging infill and mixed land use.
2. Provide a range of housing opportunities that will encourage "least cost" housing and housing geared toward municipal needs.
3. Encourage commercial and industrial growth on suitable land in appropriate areas recognizing the existing roadway system
4. Promote recreational opportunities.
5. Provide for zoning standards that are consistent with existing neighborhoods.

Goal V

Regulate circulation patterns throughout the Township for through traffic and local traffic demand to residential and commercial land uses.

Objectives

1. Improve roadways in response to traffic needs.
2. Encourage the continuation of the private road improvement program so that these residential communities can be serviced properly.
3. Encourage and plan for the use of mass transportation uses through additional park and ride facilities and bus services.
4. Encourage the development of multi-modal pathways.

Goal VI

Preserve character of existing lake communities

Objectives

1. Permit limited "infill" growth in existing lake communities consistent with the character of those communities.
2. Establish septic maintenance program.
3. Protect lake vistas.
4. Establish fertilizer, pesticide, and herbicide standards.
5. Minimize shoreline deforestation.

Goal VII

Encourage economic vitality of community business districts

Objectives

1. Promote a functional physical environment consisting of streetscapes, pedestrian improvements, shared parking and building design criteria.

Master Plan - Water Quality Sub Committee Report to the Planning Board, January, 2003

The following is the output from the Water Quality Sub Committee related to recommendations/actions to aid in the development of the Master Plan. The committee members are J.Chapman , Head of the West Milford High School Science Department., D. Kochakji and B. Stapleton , members of the Environmental Commission ,R. Sparkes , GIS Specialist ,W. Drew , Planning Director., J.O ' Bryant and L. Tallaksen, Planning Board members, M. Tfank, Planning Board Chairman , and D. Bell, Water Quality Consultant.

The Goal and Objectives as outlined by the Planning board are the basis of the recommendations/actions and are outlined below:

Goal: Protect Water Resources:

1. Consider alternative and technological advancements in wastewater treatment
2. Provide for methods of reducing storm water runoff and its impact through best storm water management practices.
3. Appropriately zone vacant land adjacent to open bodies of water for minimal development impact.
4. Protect areas of high ground water recharge value.
5. Protect Stream corridors

Added by the Committee:

6. Sensible lawn maintenance

The committee also discussed the need for an additional goal and formation of a sub committee for the Master plan related to **Water Quantity**.

The following are the sub committee's recommendations by objectives:

1. Consider alternative and technological advancements in wastewater treatment.

   - Draft an ordinance for the implementation of a mandatory program for the maintenance of septic systems (pump every three years).
   - Use Greenwood Lake Water Quality Grant to:
     1.Identify failing septic systems within 300 ft. of the lake.
     2.Map drainage inlets and discharge points
     3. Water testing at the outflow of Greenwood Lake

2. Provide for methods of reducing storm water run off and its impact through best storm water management practices. (non point source)

   D. Bell submitted this information.

   Owners of developed properties and the developers of undeveloped properties should incorporate Best Management practices (BMP's) into the design and operation of their facilities. These BMP's are available on the New Jersey Department of Environmental Protection (NJDEP) and at the U.S Environmental Protection Agency websites. The following points should be considered:

   - Nature of development (residential , commercial, industrial);

- Non- Point source contaminants of principle concern (petroleum hydrocarbons, solvents, metals ,suspended solids , etc.) ;

- Feasibility of using multiple BMP's , generally in a series (a treatment train) to increase efficiency of removals of non –point source contaminants;

- Feasibility of treating storm water runoff as close to the source as possible using multiple BMP's (e.g. porous catch basins, French drains for roof leaders, vegetated swales at storm sewer inlets or discharges,

- Feasibility of restricting fertilizer use on lawn and landscape areas. Where residential developments have a HomeOwners Association or equivalent, the feasibility of providing low -or - zero phosphate fertilizers through such an umbrella organization should be explored.

The goal of the storm water quality management plan for property or facility should be to reduce the practicable minimum or the net loading of storm water contaminants to the ground water resources of the Township. A common measure of such practicable reduction is the removal of 80% of the Total Suspended Solids (TSS) attributable to storm water runoff from the developed property.

A quantitative demonstration of the effectiveness of the storm water quality management system for a property or facility should be prepared using conventional modeling and/or loading techniques.

3. **Appropriately zone vacant land adjacent to open bodies of water for minimal development impact.**

- Establish buffers for stream corridors and lakes with building set back criteria.
- Recommend a zoning change. Appropriate lot sizes should be considered for properties abutting streams and lakes.

4. **Protect Areas of high ground water recharge value.**

- Groundwater Recharge Maps of West Milford should be made available to all developers and applicants to be used as a point of reference for investigating the development potential of land. This should be included as an item on the application review checklist, to insure that applicants reference this material.

5. Protect Stream Corridors

- Maintain and/or establish buffers along streams to promote vegetation to shade water and stabilize the banks.
- As a requirement for development add new buffers if needed. Buffers could be determined by the water quality:

    - Trout Production / Maintenance - 100 –125 ft either side of the bank depending on the grade.

    - Non Trout Producing - 80 ft buffer

    - Or in accordance with State regulations

- Create a GIS data layer identifying all catch basins and points of stream discharge for the entire town. This should also be on the applicants checklist.

6. Sensible Lawn Maintenance

- BMP's to keep water as clean as possible by educating the residents of West Milford on the negative effects of fertilizers, pesticides and herbicides on water quality.

There was a general feeling from all the members of this sub committee that the available GIS data bases currently available in the Planning Department are a valuable tool .It should be utilized by all to aid in drafting a West Milford Master Plan which can help guide the future development of West Milford Township.

It is recommended that the Planning Department GIS data be the first point of reference for potential applicants before any site investigations are initiated.

PB\Sub\MPWaterQuality\DraftReport-12-02

Gis@WestMilford.org

Appendix 3

From: PlanningDirector@WestMilford.org
Sent: Thursday, June 27, 2002 2:38 PM
To: Gis@WestMilford.org
Subject: FW: Natural Resource Sub Committee Report

-----Original Message-----
From: Steve Sangle [mailto:ssangle@optonline.net]
Sent: Monday, June 24, 2002 8:48 PM
To: Marty Tappan; Bernie Stapleton; Les Lynn; Richard Meany; Doug Ott; Bill Drew; Ron Farr
Subject: Natural Resource Sub Committee Report

Facts, Findings and Conclusions of the Sub Committee of the Planning Board on West Milford's Natural Resource Ordinance and it's application with the Master Plan.

me of our Natural Resources are unique and varied. However some are commonly shared with all others in New Jersey. We see the preservation and protection of these natural features as just the beginning towards the continuation of Open Space and Greenways within our Township.

Water and Air are our two most important Natural Resources. In this report, as West Milford is fortunate not to be faced with Air resource problems currently, Water will be our main concern. Water has two distinct problematic concerns. The first being Quantity and the second Quality. Let us first discuss Water Quantity. As we obtain our Water from wells which are drilled into the aquifer the amount of Development must be predicated upon the amount of this Natural Resource available. Monitoring of well data is the prime method of determining the amount of water available. Information obtained from Local and State Permits would help us obtain pertinent information. Along with this, information could be obtained by Township sponsored programs designed in cooperation with Resident Volunteers who would allow their wells to be monitored yearly which would serve as a baseline and be a guide to the condition of the aquifer.

ormation such as static water levels, recharge time, yields and depth of wells would enable us to gauge levels and changes in the aquifer. They would be effected by yearly rainfall amounts as well as droughts, Development usage, Geologic makeup of the aquifer and many other important factors. This data should be obtained by the controlling Township Department and that data entered by that Department into the Township Computer database for all

Township Departments to utilize in formulating future planning and policy. Discussions have already been started as to the necessary data needed to be as accurate as possible in determining the correct procedures to follow. We believe that regular monitoring schedules can and will produce invaluable data in ensure our future water supply. We advise that before a building permit for a single family dwelling is granted the well and septic both be installed to the Township's requirements. For multiple dwelling developments pump testing to show adequate availability may be necessary and warranted.

Water Quality would be the next subject to discuss. With the help of Professionals such as Dr. David Bell, who will be working with the Environmental Commission on Water Quality research, the sub Committee believes that stream testing, analysis and monitoring at specific sites and at specific intervals will establish a baseline to compare the effects of Development both before and after. With the assistance of Mr. John Chapman of the Science Department of West Milford High School we hope to gain the help of Students to assist with water sampling while allowing them to gain experience and knowledge in the field. Another area of Water Quality to discuss is the mandatory use of Sedimentation Catch Basins in all Township and Private drainage systems. With this a scheduled maintenance schedule for cleaning which would complement their installation and ensure minimal discharge of silt and grits into our lakes and waterways.

Still another measure is the use holding ponds for Zero increase runoff in Developments which should include the use of open top concrete tanks which would allow only the detained runoff which would rise to the top elevation of this tank to empty into them and then discharge into drainage areas. This would allow needed time for suspended solids to settle out before being discharged and also detain pollutants in theses ponds to be removed on a scheduled basis.

Our Wetlands and Flood plains are a very important resource and are as diverse as the Solar System. They are both sensitive and hearty but need our caring to ensure their continued existence. They serve as habitat for wildlife and filters our ecosystems. We must protect and preserve them at all costs. Though the State of New Jersey protects their existence whenever possible we should overlap that protection through Local Ordinances and guidelines for all Development within their proximity. Once lost they are a very difficult resource to replace. We believe extensive focus on Ordinances in this area would duplicate many existing State Ordinances and at this time we would better serve their safety by focusing on implementation of existing laws and enforcement policies of these laws. At any given point if we see any loopholes in State Law add Local provisions for their protection.

Slopes are an issue which there is no black or white answer. We have concluded that slopes 15% and over are not to be disturbed whatsoever. When it comes to Building Construction slopes 10% to 15% could be considered under certain conditions to be discussed latter in this topic. Access to these Building sites could possibly fall under another category of say 10% to 20% only if adequate Construction and Engineering precautions are used to prevent adverse effects such as erosion. We have discussed the possibility of allowing Building on these slopes when and only if it can be proven that a Natural Resource area designated by the Township will be saved. The total amount of homes allowed by zoning would not increase by a single home but certain Variances could be granted such as setbacks and frontages to achieve this goal. We have to place our Natural Resources such as wetlands, recharge areas, scenic vistas, wildlife habitat, mature tree stands and others ahead of certain Zoning requirements when it is certain to help save the Environment and our Natural Resources. They must take priority.

Our Soils are another Natural Resource to consider. Topsoil should not be allowed to be removed from the Township. Areas of soil that are prime for recharge of our water supply should be protected and this is one of the reasons for allowing limited slope development in lieu of turning these areas into impervious areas through building construction and roads.

As discussed earlier mature tree stands and certain endangered species of trees should be protected. All trees are important and therefore when complying with the Building Permit process of Well and Septic the only trees to be cut should be solely for access to accomplish these tasks. This should be strictly enforced as clear cutting and clearing for a dwelling prior to complying with the necessary requirements for a Building Permit is premature and if the Permit is not granted a valuable Resource has been lost.

As you can see each of these Resources has it's own list of negative impacts to protect for but many work together. Individual studies are helpful but we need all of them as a whole to accurately depict the true impact they will have on our Environment. This will ensure the continued existence of Open Space and Greenways which are all so necessary for our Natural Resources to survive for the future.

I would like to thank everyone on this Sub Committee and the Township Planning Department for their valued time, work and input to make this report possible.

Thank you

Steve Sangle

BUILDING PERMITS AND CERTIFICATES OF OCCUPANCY ISSUED 1987 - 2002

YEAR	NO. OF LOTS	NO. OF BUILDING PERMITS	NO. OF CERTIFICATES OF OCCUPANCY	BALD EAGLE COMMONS CONDOMINIUM UNITS-NO. OF CERTIFICATES OF OCCUPANCY
1987	63			
1988	47			
1989	33			
1990	15			
1991	10			
1992	8	**As of 9/14/92** 6	6	
1993	20	19	19	
1994	29	53	53	
1995	75	38	37	31
1996	24	42	41	26
1997	16	57	56	22
1998	10	91	90	32
1999	28	88	87	34
2000	21	55	51	48
2001	13	45	36	43
2002	24	60	29	76
TOTAL	**436**	**554**	**505**	**312**

MasterPlan\YrLotsCO-5-23-03

MASTER PLAN STATUS

MASTER PLAN TASK	SUBCOMITTEE	STATUS	TO BE STARTED	TARGETED DATE OF COMPLETION	WORK ITEM	STATUS
GOALS/OBJECTIVES	Master Plan	COMPLETED				
	Demographics	COMPLETED				
	Natural Features	COMPLETED				
	Water Resources	COMPLETED				
	Lake Communities		May 2003	August 2003		
	Business Community		May 2003	September 2003		
	Open Space			December 2003		
	Historic Preservation			December 2003		
	Senior Citizens			December 2003		
	Existing Zoning	IN PROGRESS				
EXISTING CONDITIONS	No	IN PROGRESS			MAPPING	IN PROGRESS
					CONSTRAINTS ANALYSIS/MAPPING	IN PROGRESS
EXISTING LAND USE	No	IN PROGRESS			DATA GATHERING Bd. Approval Review	IN PROGRESS
					EXISTING LAND USE MAP	NOT STARTED
					LAND DEVOTED BY USE	NOT STARTED
FUTURE LAND USE		NOT STARTED			AFFORDABE HOUSING	NOT STARTED
					FUTURE LAND USE MAPPING	NOT STARTED
CONSISTENCY/ RELATIONSHIP TO OTHER PLANS					CIRCULATION	IN PROGRESS
					NEIGHBORING PLANS	NOT STARTED
					STATE PLAN	CONTINUOUS
					COUNTY PLAN	NOT STARTED
PUBLIC COMMENT PROCESS		NOT STARTED				

RESOLUTION NO. 2003 - 12

PLANNING BOARD OF THE TOWNSHIP OF WEST MILFORD

COUNTY OF PASSAIC, STATE OF NEW JERSEY

WHEREAS, the Municipal Land Use Law at NJSA 40:55D-89 requires the periodic re-examination of the Master Plan at least every six years; and

WHEREAS, the last re-examination of the West Milford Township Master Plan was the re-examination report that was adopted October 27, 1999; and

WHEREAS, the Planning Board has reviewed the 1987 Master Plan, the 1993 and 1999 re-examination reports against the five criteria set forth in Municipal Land Use Law; and the Staff has made certain recommendations for revisions to said Master Plan.

WHEREAS, the Planning Board of the Township of West Milford hereby determines that said report fulfills the requirements as set forth in NJSA 40:55D-89.

NOW, THEREFORE BE IT RESOLVED, on this 28th day of May 2003, that the Planning Board does hereby adopt the re-examination report and that copies of same be forwarded to the Passaic County Planning Board and the Municipal Clerk of each adjoining municipality.

Board Members Eligible to Vote:

Paul Donoghue
Ada Erik
Robert Moshman
James O'Bryant
~~Edward Orthouse~~
Robert Szuszkowski
~~Andrew Tynan~~
~~Kurt Wagner~~
Leslie Tallaksen
~~Kathleen Caren~~
Michael Tfank

For 7
Against 0
Abstain 0

Michael Tfank, Chairman
Planning Board

Grace R. Davis, Secretary
Planning Board

PB\resolutns\Re-exam-MP-03

RE-EXAMINATION REPORT

MASTER PLAN

TOWNSHIP OF WEST MILFORD

OCTOBER 27, 1999

West Milford Township Planning Board

Michael Tfank, Chairman
James O'Bryant, Vice Chairman
Maria Harkey, Mayor
Robert Moshman, Council Representative
Paul Donoghue
Thomas Gensheimer
Edward Orthouse
George Spence
Susan Ugrovics
Andrew Tynan, Alternate 1
Richard Stecher, Alternate 2

Glenn C. Kienz, Planning Board Attorney

Grace R. Davis, Planning Board Secretary

Prepared by:

Township of West Milford Planning Department

William H. Drew, P.P., Township Planner

Linda M. Lutz, P.P., Principal Planner

(The original document on file in the Planning Department has been appropriately signed and sealed in accordance with N.J.S.A. 45:14A-12)

William H. Drew, P.P. 03971

MASTER PLAN RE-EXAMINATION REPORT

TOWNSHIP OF WEST MILFORD

The Municipal Land Use Law requires that every municipality conduct a periodic examination of its Master Plan at least every six years. The law stipulates that the re-examination report is to state:

I. The major problems and objectives relating to land development in the municipality at the time of the adoption of the last re-examination report.

II. The extent to which such problems and objectives have been reduced or have increased subsequently.

III. The extent to which there have been significant changes in the assumptions, policies and objectives forming the basis for the Master Plan or development regulations as last revised.

IV. The specific changes recommended for the Master Plan, if any, including underlying objectives, policies and standards, or whether a new plan or regulations should be prepared.

V. The recommendations of the Planning Board concerning the incorporation of redevelopment plans adopted pursuant to the "Local Redevelopment and Housing Law," P.L.1992, c. 79 (C.40A:12A-1 et al.) into the land use plan element of the municipal Master Plan, and recommended changes, if any, in the local development regulations necessary to effectuate the redevelopment plans of the municipality.

The following is an analysis of the current Master Plan and its re-examination in accordance with the above criteria.

I. A. **The problems identified were**:

1. Septic capabilities.
2. Potable water supply.
3. Development increases.
4. Watershed responsibilities.
5. Other environmental constraints.
6. Slow real estate market.

B. The following goals or objectives were identified:

1. To preserve the semi-rural character of the Township.
2. Preserve the pristine nature of the forest, waterways and sensitive areas.
3. Encourage growth that will minimize impacts on air and water quality.
4. Encourage a pattern of land use that will provide reasonable residential, commercial and industrial land use consistent with the character of the Township.
5. Promote active recreational opportunities on both public and private lands and in the area of public lake areas.
6. Encourage energy conservation of scarce fossil fuels.
7. Improve circulation patterns throughout the Township for through-traffic and local traffic demands to residential and commercial land uses.
8. Provide municipal and social services to meet the demands of the existing and future population and to achieve efficiency in the administration of these services.
9. Identify centers and infrastructure needs.
10. Prepare a comprehensive recreation Master Plan addressing public and private recreation needs.

II. The extent to which problems and objectives have been reduced or have increased.

Septic capabilities, potable water supply, watershed responsibilities and other environmental constraints are still considered to be valid concerns on the part of the Township with regard to accommodating existing as well as new populations. In the last six years the real estate market has rebounded. This has placed increased development pressures upon the Township from both previously approved projects protected by the Permit Extension Act, and new applications. Most are subdivision applications for residential development.

Local and State initiatives to manage growth have also occurred within the past six years. The Planning Board has prepared the Center Designation Report and petitioned for designation with the State Planning Commission. The Board's plan has been found by the Office of State Planning to be in conformance with the goals and objectives of the State Development and Redevelopment Plan and recommended by that agency for adoption by the State Planning Commission. The Township Council has provided funds for the preparation of a new Wastewater Management

Plan, which provides for the reduction of the sewer capacity potential from 5.2 MGD to 3.16 MGD. This plan identifies sanitary sewer infrastructure needs and is in conformance with the Center Designation Report.

The State has purchased land at an accelerated pace, acquiring 3,749 acres in fee simple ownership and recently acquired the Greenwood Lake Airport. In addition, open space easements have been purchased on 7,358 acres of Newark Watershed Conservation and Development Corporation land. The Township has acquired and land-banked almost 300 acres on which a development of 400 townhouses and golf course was proposed in the late 1980s.

The State has implemented a program to pay watershed municipalities so as to compensate for the loss in tax revenues. This program is in effect for as long as the watershed moratorium remains in effect. This enables the Township to further address preserving the environment and semi-rural character of the Township.

The Township has demonstrated its sensitivity regarding watersheds and water quality. Recently watershed planning has evolved as a planning approach to assess land use and development impacts. With the Township's state-of-the-art GIS technology, the Planning Board is well positioned to implement watershed planning techniques to continue the monitoring of this sensitive issue.

NJDEP has recently presented mapping of threatened and endangered species and their habitats throughout the State. Through utilization of GIS, the Board will be able to utilize this information to its fullest in its continued stewardship.

The Recreation Committee assisted a recreation consultant in the preparation of a recreation Master Plan, which was adopted by the Township Council.

The Planning Board held a public meeting regarding Hewitt Village to elicit input from the neighborhood on how it could develop with respect to character and land uses. The use of public access to Greenwood Lake was discussed.

With regard to circulation, problems have been reduced through the private road program. Several roads, especially in the Upper Greenwood Lake section of the Township, that were private have been improved to Township standards and subsequently taken over by the Township. Cahill

Cross Road has been constructed between Ridge Road and Morsetown Road. Also, a transportation circulation plan has been developed in conjunction with the Town Center Plan, to calm traffic and provide safe, alternative transportation means.

III. **Examine the extent to which there have been significant changes in the assumptions, policies and objectives forming the basis for the Master Plan or development regulations.**

The Township Master Plan goals and objectives established in 1987 remain valid. In conformance with the State Development and Redevelopment Plan, the 1987 Master Plan goals and objectives have been refined in the Town Center Designation Report to address the findings and recommendations of those studies. The Township has adopted this plan and submitted the same to the State Planning Commission for designation. The Planning Board will formulate a zone plan that references and reflects nitrate dilution modeling.

IV. **The specific changes recommended for the Master Plan or development regulations, including underlying objectives, policies and standards, or whether a new plan or regulations should be prepared.**

The Planning Board after review of the Land Disturbance Criteria and nitrate dilution modeling will pursue ordinance revisions as may be deemed necessary and appropriate by the Board.

It is recommended that the Center Designation Report be modified to conform with the Master Plan requirements outlined in the State Municipal Land Use Law, and the Planning Board adopt this as the Township's Master Plan. The goals and objectives outlined therein should then be pursued.

V. **The recommendations of the Planning Board concerning the incorporation of redevelopment plans.**

In 1995, the Planning Board adopted Resolution 1995-12, recommending to the Council the designation of an area for redevelopment, which was subsequently done by the Council. The area is generally bounded by Macopin, Maple, Schofield, Otterhole and Weaver Roads and has been identified in the Center Designation Report. It is recommended that an amendment to the development regulations be made, which would bring the entire area into conformance with the

requirements of the Recreation Ordinance that was adopted by the Township in 1998.

PB\Bdrpts\Re-exam-MasterPlan-099

RESOLUTION NO. 1999 - 34

PLANNING BOARD OF THE TOWNSHIP OF WEST MILFORD

COUNTY OF PASSAIC, STATE OF NEW JERSEY

WHEREAS, the Municipal Land Use Law at NJSA 40:55D-89 requires the periodic re-examination of the Master Plan at least every six years; and

WHEREAS, the last re-examination of the West Milford Township Master Plan was the re-examination report that was adopted November 4, 1993; and

WHEREAS, the Planning Board has reviewed the 1987 Master Plan and the 1993 re-examination report against the five criteria set forth in Municipal Land Use Law; and the Staff has made certain recommendations for revisions to said Master Plan.

WHEREAS, the Planning Board of the Township of West Milford hereby determines that said report fulfills the requirements as set forth in NJSA 40:55D-89.

NOW, THEREFORE BE IT RESOLVED, on this 10th day of November 1999, that the Planning Board does hereby adopt the re-examination report and that copies of same be forwarded to the Passaic county Planning Board and the Municipal Clerk of each adjoining municipality.

Board Members Eligible to Vote:

Paul Donoghue	Edward Orthouse	For 7
~~Thomas Gensheimer~~	George Spence	Against 0
~~Maria Harkey~~	~~Susan Ugrovics~~	Absent ~~1~~
~~Robert Moshman~~	Andrew Tynan	Abstain 0
James O'Bryant	Rich Stecher	
Michael Tfank		

Michael Tfank, Chairman
Planning Board

Grace R. Davis, Secretary
Planning Board

RE-EXAMINATION REPORT
MASTER PLAN
WEST MILFORD TOWNSHIP

November 4, 1993

West Milford Township Planning Board

A. C. Boschen, Chairman
Ralph Villecca, Vice Chairman
Carl Richko, Mayor
Glenn Wenzel, Council Representative
Frederick Ernst
David Kotek
Cornelius Prol
James Robinson
George Spence
Maria Harkey, Alternate 1
James O'Bryant, Alternate 2

GLENN C. KIENZ, PLANNING BOARD ATTORNEY

MARGARET J. ZESTER, PLANNING BOARD SECRETARY

Prepared by:

WEST MILFORD TOWNSHIP PLANNING DEPARTMENT

WILLIAM H. DREW, P.P., TOWNSHIP PLANNER

LINDA L. LUTZ, P.P., SENIOR PLANNER

(The original document on file in the Planning Department has been appropriately signed and sealed in accordance with N.J.S.A. 45:14A-12)

William H. Drew, P.P. 03971

**MASTER PLAN RE-EXAMINATION REPORT
TOWNSHIP OF WEST MILFORD**

The Municipal Land Use Law requires that every municipality conduct a periodic examination of its Master Plan at least every six years. The law stipulates that the re-examination report is to state:

- I The major problems and objectives relating to land development in the municipality at the time of the adoption of the last re- examination report.
- II The extent to which such problems and objectives have been reduced or have increased subsequently.
- III The extent to which there have been significant changes in the assumptions, policies and objectives forming the basis for the Master Plan or development regulations as last revised.
- IV The specific changes recommended for the Master Plan, if any, including underlying objectives, policies and standards, or whether a new plan or regulations should be prepared.

The following is an analysis of the current Master Plan in accordance with these four criteria.

I. A. The problems that were identified in the 1987 Master Plan are:

1. Septic capabilities.
2. Potable water supply.
3. Development increases.
4. Watershed responsibilities.
5. Other environmental constraints.

B. The 1987 Master Plan identified eight goals or objectives and they are:

1. To preserve the semi-rural character of the Township.
2. Preserve the pristine nature of the forest, waterways and sensitive areas.
3. Encourage growth that will minimize impacts on air and water quality.
4. Encourage a pattern of land use that will provide reasonable residential, commercial and industrial land use consistent with the character of the Township.

5. Promote active recreational opportunities on both public and private lands and in the area of public lake areas.
6. Encourage energy conservation of scarce fossil fuels.
7. Improve circulation patterns throughout the Township for through traffic and local traffic demands to residential and commercial land uses.
8. Provide municipal and social services to meet the demands of the existing and future population and to achieve efficiency in the administration of these services.

II. The extent to which problems and objectives have been reduced or have increased.

Septic capabilities, potable water supply, watershed responsibilities and other environmental constraints are still considered to be valid concerns on the part of the Township with regard to accommodating existing as well as new populations. In the last six years, however, development pressures have decreased. In the late 1980's, the Planning Board saw many applications for large scale developments and most of these received approvals. In the early 1990's, however, the number of applications decreased and the majority of those that were approved were not built due to the economic and real estate climate.

This does not mean, however, that the concern on the part of the Township Officials has waned. The Township has used this time of reduced development activity to improve its ordinances. A case in point is the Natural Features Ordinance in conjunction with new land disturbance criteria. Together, these ordinances provide for no disturbance of slopes in excess of 35% and for a limit on the amount of a single family lot, created as part of a subdivision, that can be disturbed when it is developed. These new criteria help to address the preservation of the pristine nature of the forest, waterways and sensitive areas.

Regional studies recently completed have an impact upon the Township Master Plan that should be addressed. The *New York-New Jersey Highlands Study*, prepared by the USDA Forest Service, identified 5 goals relating to land use - 1.) manage future growth, 2.) maintain an adequate water supply, 3.) conserve contiguous forests, 4.) provide recreational activities and promote economic prosperity that is compatible with goals 1-4. More specifically, goal 5 summarizes by proposing to...

> "Foster integrated regional land use planning that focuses development (and redevelopment) in infrastructure rich areas, and minimizes the pressure on local tax bases by incorporating the incremental increase of municipal services into the developmental costs."

The State identified eight goals effecting land use in its *State Development and Redevelopment Plan* as follows: 1.) revitalize urban centers and areas, 2) conserve natural resources, 3.) promote economic growth, development and renewal, 4.) protect the environment, 5.) provide public services at a reasonable cost, 6.) provide adequate housing at a reasonable cost, 7.) preserve and enhance historic, cultural, open space and recreational lands and structures and 8.) ensure sound and integrated planning statewide. These two studies' sets of goals, relating to the development of existing centers and the development of new centers serves to further address the objectives set forth in the master plan and identified as numbers 1, 2, 3, 4, 6, and 7 in this report. The semi-rural character of the Township would be preserved, as would the pristine nature of the forest, waterways and sensitive areas. Growth that would minimize impacts on air and water quality would be encouraged, as would patterns of land use that would provide reasonable residential, commercial and industrial land use consistent with the character of the Township. Energy conservation of scarce fossil fuels would be encouraged as a result of the center designation process. Circulation patterns would be improved as well.

With regard to circulation, problems have been reduced through the private road program. Several roads, especially in the Upper Greenwood Lake section of the Township, that were private have been improved to Township standards and subsequently taken over by the Township.

One other Master Plan objective which needs to be addressed is #5, promote active recreational opportunities on both public and private lands and in the area of public lake areas. The zoning ordinance does not provide a clear permitted use list or standards for recreation oriented activities. Therefore, the Planning Board should establish standards that are consistent with the goals and objectives of the Master Plan.

III. Examine the extent to which there have been significant changes in the assumptions, policies and objectives forming the basis for the Master Plan or development regulations.

The Township Master Plan goals and objectives established in 1987 remain valid. However, regional studies, ie., *The State Development and Redevelopment Plan* and *The New York-New Jersey Highlands Regional Study*, both of which were completed subsequent to 1987, cause the 1987 Master Plan goals and objectives to be refined and fine tuned to address the findings and recommendations of those studies.

IV. The specific changes recommended for the Master Plan or development regulations, including underlying objectives, policies and standards, or whether a new plan or regulations should be prepared.

Based on the above, it is recommended that changes be made to the West Milford Township Master Plan. A whole new plan is not necessarily required because the general assumptions of the 1987 plan are still valid. The major change, however, relates to the State Plan and the Centers Designation process. In concurrence with the State Plan, centers need to be identified and infrastructure needs of all levels will be addressed. The objectives noted above will be furthered by the studies and reports produced to accomplish the Centers Designation process. In addition, a comprehensive recreation plan element is necessary addressing public and private recreation needs and the manner in which these can best be addressed.

RESOLUTION NO. 1993-25

PLANNING BOARD OF THE TOWNSHIP OF WEST MILFORD

COUNTY OF PASSAIC, STATE OF NEW JERSEY

WHEREAS, the Municipal Land Use Law at NJSA 40:55D-89 requires the periodic re-examination of the Master Plan at least every six years; and

WHEREAS, the last revision to the West Milford Township Master Plan was the plan that was adopted May of 1987; and

WHEREAS, the staff, the Master Plan subcommittee, and the Planning Board have reviewed the 1987 Master Plan against the four criteria set forth in Municipal Land Use Law; and the Staff and the Master Plan subcommittee have made certain recommendations for revisions to said Master Plan.

WHEREAS, the Planning Board of the Township of West Milford hereby determines that said report fulfills the requirements as set forth in NJSA 40:55D-89;

NOW THEREFORE BE IT RESOLVED, on this 4th day of November 1993, the Planning Board does hereby adopt the re-examination report and that copies of same be forwarded to the Passaic County Planning Board and the Municipal Clerk of each adjoining municipality.

Board Members Eligible to Vote:

~~Neil Prol~~	~~Fred Ernst~~
Glenn Wenzel	James Robinson
Maria Harkey	~~Carl Richko~~
Dave Kotek	George Spence
James O'Bryant	Ralph Villecca
Al Boschen	

For 8
Against 0
Absent 0
Abstain 3

A. C. Boschen, Chairman
Planning Board

Margaret J. Zester, Secretary
Planning Board

F:\WORD\PB\RESOLUTN\MSTRPLN.020

MASTER PLAN

TOWNSHIP OF WEST MILFORD

PASSAIC COUNTY, NEW JERSEY

MAY, 1987

PLANNING BOARD:

Mary Haase, Chairman
Judy Keenan, Vice Chairman
Stewart Perry, Mayor
Edwin Aldrich, Councilman
Eugene Richards, Construction Official
Robert Gunderman
Edward Mahon
John Vasilenko
Cynthia Walsh
Leo Morris, Alternate
Doris Osterhoudt, Alternate
William Wobbekind, Board Attorney

COUNCIL

Stewart Perry, Mayor
Edwin Aldrich, Deputy Mayor
Peter Gillen, Councilman
Arthur Mildner, Councilman
Charles Slawinski, Councilman

TOWNSHIP MANAGER - Carroll Pickens

TOWNSHIP ATTORNEY - Martin Murphy

TOWNSHIP ENGINEER - Andrew Lycosky

PLANNING DEPARTMENT STAFF:

Kenneth Ochab, Planning Director
Eileen Banyra, Senior Planner
Steven Lydon, Senior Planner
Debbie McCloskey, Assistant Planner
Gladys DeCesare, Planning Board Secretary
Carolyn Bartkowicz, Board of Adjustment Secretary

FORMER PLANNING BOARD MEMBERS

Arthur Mildner, Councilmen
Charles Slawinski, Councilman
Victor Marchifava
Robert Jones, Board Attorney

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GOALS AND OBJECTIVES OF THE MASTER PLAN

GOAL I: To preserve the semi-rural character of the Township

Objectives:

1.) Acquisition of lands of scenic, cultural or historic value
2.) Encourage development to be aesthetically pleasing and energy efficient
3.) Preserve and encourage open space retention of sensitive lands
4.) Promote farmland preservation through appropriate zoning
5.) Promote recreational opportunities in existing open space
6.) Prevent sprawl type development throughout the Township and encourage development in specific growth districts

GOAL II: Preserve the pristine nature of the forests, waterways, and sensitive areas

Objectives

1.) Discourage growth and protect lands with major physical constraints
2.) Provide suitable land uses on sensitive lands through zoning
3.) Protect existing lakes from continued deterioration

GOAL III: Encourage growth that will minimize impacts on air and water quality

Objectives

1.) Consider alternate wastewater treatment and technological advancement in wastewater design
2.) Encourage residential growth within reasonable proximity to existing commercial areas and develop new commercial areas where necessary
3.) Provide for methods of reducing the impact of urban runoff through adequate stormwater management practices
4.) Permit limited "infill" growth in existing lake communities consistent with the character of those communities

GOAL IV: Encourage a pattern of land use that will provide reasonable residential, commercial, and industrial land use consistent with the character of the Township.

Objectives:

1.) Promote and focus growth in town center, encouraging mixed land uses
2.) Provide a range of housing opportunities that will encourage "least cost" housing and housing geared toward specific municipal demands
3.) Encourage commercial and industrial growth on suitable land in appropriate areas recognizing the existing and proposed highway system

GOAL V: Promote active recreational opportunities on both public and private lands and in the area of public lake areas.

Objectives:

1.) Promote further development of our state and county parks for active recreation
2.) Develop a trail system linking recreational as well as historical and cultural sites

GOAL VI: Encourage energy conservation of scarce fossil fuels

Objectives:

1.) Promote energy conservation techniques in building design and construction
2.) Encourage transportation systems that are energy efficient such as car pooling, park and ride facilities, ride sharing and bike paths
3.) Provide bikeways and pedestrian paths to discourage individual car trips
4.) Provide new roads that would ease traffic congestion and reduce fuel consumption
5.) Improve the transportation services to increase the availability of town services to residents

GOAL VII: Improve circulation patterns throughout the Township for through traffic and local traffic demand to residential and commercial land uses

Objectives

1.) Plan for the improvement of major intersections and for the improvement of major roadways to accommodate future growth

2.) Design and construct new roadways to meet the demand for safe and efficient movement of traffic
3.) Encourage the continuation of the private road improvement program so that these residential communities can be serviced properly
4.) Encourage and plan for the use of mass transportation uses through additional park and ride facilities and bus services.

GOAL VIII: Provide municipal and social services to meet the demands of the existing and future population and to achieve efficiency in the administration of these services

Objectives

1.) To provide for the wide ranging needs of recreational programs both active and passive throughout the Township
2.) Assess the emergency service needs in terms of police, fire and first aid services and to recommend future actions
3.) Promote additional library facilities to maintain the level of services currently provided within the large expanse of the Township

MUNICIPAL LAND USE LAW

The Municipal Land Use Law as amended contains a section dealing specifically with Master Plans. Section 19 of the Law provides that the Planning Board may prepare a Master Plan of the Township to guide the use of lands and protect public health and safety and promote the general welfare. The Master Plan is not required by law. However, the zoning ordinance must conform to the land use element of the Master Plan. This strongly suggests, therefore, that in order to have a valid zoning ordinance, a municipality is required to develop a land use element of the Master Plan.

The Law states that "the master plan shall generally comprise a report or statement and land use and development proposals, with maps, diagrams, and text, presenting where appropriate the following elements:

1.) A statement of objectives, principles. assumptions, policies, and standards upon which the constituent proposals for the physical, economic, and social development of the municipality are based;

2.) A land use plan element (a) taking into account the other master plan elements and natural conditions, including, but not necessarily limited to topography, soil conditions, water supply, drainage, flood plain areas, marshes and woodlands. (b) showing the existing and proposed location, extent and intensity of development of land to be used in the future for varying types of residential, commercial, industrial, agricultural, recreational, educational, and other public and private purposes or combination of purposes, and (c) including a statement of the standards of population density and development intensity recommended for the municipality.

3.) A housing plan element including, but not limited to, residential standards and proposals for the construction and improvement of housing;

4.) A circulation plan element showing the location and types of facilities for all modes of transportation required for the efficient movement of people and goods into, about, and through the municipality.

5.) A utility service plan element analyzing the need for and showing the future general location of water supply and distribution facilities, drainage and flood control facilities, sewerage and waste treatment, solid waste disposal, and provision for other related utilities;

6.) A community facilities plan element showing the location and type of educational or cultural facilities. historic sites, libraries, hospitals, fire houses, police stations, and other related facilities including the relation to the surrounding areas;

7.) A recreation plan element showing a comprehensive system of areas and public sites for recreation; and

8.) A conservation plan element providing for the preservation, conservation, and utilization of natural resources including, to the extent appropriate, open space, water, forests, soil, marshes, wetlands, harbors, rivers and other waters, fisheries, wildlife, and other natural resources;

9.) An energy conservation plan element which systematically analyzes the impact of each other component and element of the master plan on the present and future use of energy in the municipality, details specific measures contained in the other plan elements designed to reduce energy consumption and proposes other measures that the municipality may take to reduce energy consumption and to provide for the maximum utilization of renewable energy sources; and

10.) Appendices or separate reports containing the technical foundation.

The Master Plan can be subdivided into subplans and projected into periods of time or staging sequences.

Finally, the Plan must include a policy statement indicating the relationship of the proposed development of the Township in the Master Plan to; the Master Plan of contiguous municipalities, the Master Plan of the County, and any comprehensive guide plan.

In 1981, a revision to the law required that a Storm Water Management Plan be prepared in conjunction with the Master Plan process. This provision, however, was contingent upon a grant to municipalities to fund the preparation of the Plan. Grants have not been available from DEP, therefore, making the preparation of the Storm Water Management Plan voluntary. If, at some point, funds do become available, we would be required to prepare such a plan.

Obviously, the most important aspect of the Master Plan is the land use element since it must take into account the other Plan elements and is the basis for the formulation and adoption of the zoning ordinance.

Land use, housing, circulation, and community facilities are included in the 1976 Master Plan. The Utility Service Plan should be examined since the Board has the report of Malcolm Pirnie concerning future prospects for water and sewer facilities; both community wide and individual systems. Drainage and flood control can be reviewed with this element, however, it might be more effective to include it in any storm water management plan developed by the Board.

The recreation and conservation plan element can be extracted from the Open Space Plan and the 1983 Recreation Plan. Modifications or expansions can be made by the Board when these elements are reviewed.

The Energy Conservation Plan is a new section added by a 1980 revision to the Law. The intent of this plan is to examine the effect of land use, transportation, and other Master Plan elements upon energy consumption. It seeks to include energy considerations into the planning process. The Plan may also include recommendations for development ordinance revisions such as solar access and design requirements.

The Storm Water Management Plan section is the most recent addition, being included in 1981. Although this plan is required contingent upon state funding being available, the Planning Board has been strong in its efforts in working towards development of the Plan.

HISTORY

Through the years West Milford has been formed by the molding and remolding of its river valleys, mountain rises, streambeds, lakes and moraines due to various geological forces. The final shaping of the area came about after the receding of the Wisconsin glacier some 14,000 years ago.

West Milford is the second largest municipality in northern New Jersey. It lies on top of the Northern Highlands, a continuous series of ridges and plateaus that extends northeasterly to the Hudson Highlands and New England's Green Mountains, and to the southwest near Reading, Pennsylvania.

West Milford is comprised of 80 square miles that is bordered on the west and south by Bearfort Mountain and the Pequannock River and Bloomingdale. To the north lie Greenwood Lake and the New York state border; to the east, Ringwood and the Wanaque Reservoir.

In 1775, West Milford was divided in half with the northern part in Franklin and the south in the Saddle River area. Later, the area became part of Pompton Township and became the Township of West Milford in 1834.

In 1837, with the formation of Passaic County out of Bergen and Essex, West Milford left Bergen County after being affiliated with it for 127 years. A township committee of three led the town through periods of growth, decline and change for 155 years. In 1969, the present town council-town manager plan was adopted and the number of members rose from three to five.

In the 18th Century, industry was drawn to the area for the iron ore in the mountains, the acres of hardwood trees and the fast moving streams. In 1764 a German by the name of Peter Hasenclever started the Long Pond Furnace. By 1768 the furnace was producing 20-25 tons of pig iron per week. The furnace eventually closed in 1880 due to an unsuccessful changeover using water power.

The 1800's saw the construction of three other furnaces, the most successful being the one near Clinton Falls, which ran for nearly 17 years. The other two were the Wawayanda Furnace (10 years) and the Noble Furnace (unsuccessful).

In the 19th Century there were two mines in operation. Both are located in the Norvin Green State Park and are known as the Roomy Mine and Blue (or Iron Hill and London) Mine. The ore found here was used at the local furnaces.

With the growth of the iron industry came the necessity of having an abundance of charcoal to feed the furnaces. The preferred wood was chestnut, but other woods had been used.

Another necessity in the production of molten iron was lime and lime kilns began to spring up near areas where limestone could be found, particularly around the mines and furnaces. The remains of ore may be found at the old Long Pond Furnace.

After the first permanent homes were constructed, saw and grist mills began to dot the landscape. The first saw and grist mill was built around the 1700's. The grist mill was built along the Pequannock River bank by La Roe, while a saw mill was also constructed at the bottom of Warwick Turnpike.

Other businesses that eventually sprang up were in the cutting of cedar shingles, the making of barrel hoops, and the tanning of hides. There was even a knife factory in Newfoundland on the Pequannock River.

The historical development of West Milford in the 1800's was highly dependent upon the emerging transportation systems. The main form of transportation in the 1850's was the Peterson and Deckertown Stage Line. In the 1920's there was a need for a railroad service across New Jersey. In 1832, a charter was granted to the New Jersey Hudson and Delaware Railroad to start at a point on the Delaware River between the New York state line and the area where Paulings Kill empties into the Delaware. They were to build a bridge across the Delaware and run tracks to Stockholm and on to the Hudson opposite New York City. In 1869, there was a meeting to discuss extending the line to Newfoundland. One year later, the New Jersey Hudson and Delaware merged with

the New Jersey and Western to form the New Jersey Midlands Railroad. It is not clear as to when the line was finished, but a small track called the Macopin Line was completed in 1887. The line, which was one and a half miles long, serviced the ice industry that existed in Echo Lake as well as bringing tourists to the area.

The railroads created the development of hotels and boarding houses along the railroad route and around Greenwood Lake. Wickham's Boarding House became a popular spot on the lake.

In the 1890's there were two boarding houses located on Route 23 - Bon Aire and Red Rock. Red Rock advertised that they were the "same as North Adirondacks, with good food, all for $2.50 per day". In the 1900's Newfoundland had twenty hotels and boarding houses which could hold six to seventy-five guests. There was the Green Pond Hotel, Glen Cottage, Fairview Villa, Van Dien House, and Idylease Inn.

The Idylease Inn, located on Union Valley Road, open year round, was advertised as a health resort. The Inn was founded in 1903 by Dr. Edgar A. Day. Even after his death in 1906 and Idylease continued to offer rest and relaxation to their guests after the end of the railroad service.

In 1892, the City of Newark contracted with the East Jersey Water Company for a six million dollar project that would bring by 1892, up to fifty million gallons of water a day to Newark.

From 1885 to 1889, the Montclair and West Milford Water Companies had secured land and rights-of-way for Lake Macopin, Oak Ridge and Clintom Reservoirs as well as acquiring other Northern New Jersey water areas. Eventually, the East Jersey Water Company took over the other water companies.

The East Jersey Water Company then built the necessary reservoirs and in 1900 transferred 35,000 acres, divided among six municipalities (West Milford, Hardyston, Jefferson, Kinnelon, Rockaway, and Vernon), including the 17,000 acres in West Milford and five reservoirs to the City of Newark.

The land was flooded in 1892. The Oak Ridge and Clinton Reservoirs would hold more than six billion gallons of water. In 1896, Canistear was completed and in 1961, the Charlottesburg area was flooded. By the early 1900s, the City of Newark had purchased Echo Lake and much of the surrounding area for watershed purposes. Consequently, the hotels and boarding houses were eventually razed.

Today, the Newark Watershed Conservation and Development Corporation manages the 35,000 acres of land. On this land, there is situated five reservoirs with a total storage capacity of 14.4 billion gallons of water.

The beginning of Greenwood Lake, first known as Long Pond, started in 1768 by Peter Hasenclever. When Hasenclever first saw the lake, he saw it as a reservoir for water storage and as a power source for his iron works. He constructed the first dam, 200 feet long and five feet high in the eastern shore glen.

In 1836, Jacob M. Ryerson, owner of the Ringwood Company, allowed the Morris Canal Company to build a dam across the southern tip of the now called Greenwood Lake. This raised the pond by twelve feet, covering the south end, the east, west, and north arms. The area of the lake was doubled.

With the mountains rising 700 feet above the lake, (it being 621 feet above sea level), the area soon became a haven for sportsmen, fishermen, and vacationers. It was called the "Switzerland of the East".

In 1867, the Montclair Railroad Company was formed and planned to construct a railroad from Montclair to Greenwood Lake. It wasn't until 1874 that the 40.9 mile line was finished. In 1876 the railroad line was extended along the east shore of the lake. Soon steamboats, boarding houses and hotels began to spring up around the shore line.

By the turn of the century, there were twenty-five hotels and four steamboats. The resorts included Woodlands Hotel, Fenton's Casino and Brown's Hotel. Old photos show vacationers playing lawn tennis and croquet. Brown's Hotel attracted fighters like Joe Louis and "Gorgeous George" at the outdoor ring.

The steamboats travelled to and from the East and West shore. The Montclair had a capacity of 400 passengers while the Milford, Arlington, and Anita each held 100.

In the 1900's West Milford began settling down to a slow pace. The grand hotels shut their doors, many burning to the ground. The forges and mills, which had served the community, closed.

The 1920's and 1930's introduced cars, paved roads, electricity, and telephones into the area. Summer communities began developing. Lindy's Lake, Gordon Lakes, and Lake Lookover came into existence. In 1927, Pinecliff Lake was formed. Wonder Lake soon followed.

In 1932 came West Milford Lakes and Upper Greenwood Lake. Developed as summer communities, these areas increased in population from 2,000 in the winter to 25,000 in the summer. This brought in much needed income, yet required a minimum of municipal services.

At the end of World War I, the characteristics of the communities changed. Non-lake communities with year round homes became extant. The year 1925 saw Wallisch Estates with Greenbrook coming in 1945, Gwinear in 1952, Sundown Farms in 1951, and Farm Crest in 1956. The 60's saw Olde Milford Estates, Camelot, High View and Crescent Park.

The history of West Milford has shown the town evolving from an area where the iron industry was dominant, to a summer resort, to a year-round community. Through the years, West Milford has been able to maintain the beauty and peacefulness that first inspired the Dutch, English, and French to settle in the area.

background

1976 MASTER PLAN SUMMARY

The 1976 Master Plan by necessity made a number of assumptions and recommendations based on current information. It is prudent to review the 1976 Plan as a starting point to developing this Master Plan document.

The 1976 Plan spent considerable time discussing the State Housing Plan and the Mount Laurel case. At that time, the state was developing a housing allocation plan that all municipalities would have to comply with. This, together with the Mount Laurel decision, created a significant amount of uncertainty with regard to the Plan.

The Plan went on to discuss the development constraints within the Township, the extent of public ownership of land, specifically excluded the Newark Development plan and recognized the Skylands recreation region. Residential growth had been slow as a result of West Milford's location outside a growth corridor (i.e. Route 80, Route 46), the natural constraints of the land and the extent of public land ownership. The exception was the conversion of summer to year-round homes which continued through the 1960-1970 decade to 1975. Industrial growth was slowed by physiographic constraints, lack of municipal services, and transportation.

The Private Land Use Plan reflected the above characteristics with R-4 being predominant with R-1, R-2, and R-3 recognizing physical constraints yet permitting increased densities with public water and sewer facilities. Community Commercial, Highway Commercial, and Office Commercial areas are designated. The CC area was provided throughout the Township in various neighborhood areas, HC was provided on private lands along Route 23 and OC uses were indicated in the Township Center area of Union Valley Road - Marshall Hill Road. Limited Manufacturing/Industrial areas were designated and industrial parks were encouraged.

The Traffic and Circulation plan sought to improve existing roadways rather than construct new roads and to utilize existing roads as a means of preserving the rural character of the Township. A number of roadway and intersection improvements were identified in the Plan. Acquisition techniques of future rights-of-way were discussed through developer dedication and reservations. Short term measures of traffic improvement such as improving sight distance, signing, removal of obstacles, etc. were recommended.

The Community Facilities plan indicated no immediate short fall in municipal services such as school, fire, first aid, library and recommended continued development of land where existing services are provided. The Wanaque Regional sewer trunk line was identified as viable and land uses along the line were designated as developing to a density appropriate to having the line constructed (i.e. cluster, reduced lot sizes and industrial development).

LAND USE SINCE 1977

The examination of the Township's existing land use and development pattern is an important element in revision and preparation of the Master Plan. Analysis of the past growth patterns is a predominant factor in formulating the land use element of the plan.

Single Family Development

Since 1976 single family development has been the dominant residential land use. It has exhibited itself in several forms:

1) new or expanded subdivisions. These would include Sections 5 & 6 of Olde Milford Estates, the expansion of lots on Oxbow Lane (Sundown Farms),and Rockburn.

2) Infill development in existing communities including Upper Greenwood Lake, Awosting, Pinecliff Lake, West Milford Lakes, East Shore, Lindy Lake, etc.

3) Small subdivision and individual lot activity along major township roadways i.e. Ridge Road, Union Valley Road, Macopin Road.

Multi Family

There has been only one successful large multi-family project since 1976; Bald Eagle Village consisting of 440 townhouse units. Construction began in 1983.

Since 1977 there have been several small multi-family projects constructed through the use variance process. These projects include LaPointe (2 d.u.) Union Valley Road, Nicholas Carrier (4 d.u.) Oak Ridge Road, Strus (9 d.u.) Oak Ridge and Simon (8 d.u.) in Oak Ridge.

No mobile home parks were developed although one application was made for approval (Dockerty Hollow Rd.). It was subsequently withdrawn.

Commercial Recreation

This land use has possibly had the greatest amount of activity since the adoption of the Master Plan in terms of intensity of the projects and the effect they would have had upon the Township. The projects included Eagles Nest, Arrowhead and Lake Isle totaling 5300 campsites with Eagles Nest alone at 5,000. None of these has been constructed to date with Arrowhead never receiving Planning Board approvals.

However the existing KOA on Westbrook Road was granted permission to expand to 200 total sites and a number of horse farms and related commercial recreation activities (camps, City of Newark recreation facility) were established during the period since the Master Plan adoption. Major projects include N.J. Association of Retarded Children Camp expansion, Project Use expansion and Camp Watershed.

Commercial

A number of commercial establishments were developed since 1977 in various locations throughout the Township. Areas of concentrated commercial activity include the Town Center, Oak Ridge-Rte. 23. The total commercial land area has increased by almost 200 acres.

Several commercial buildings were constructed in the Town Center area since 1977. They include Highland Sport Shop, McDonald's, West Milford Stone & Garden, Greenwood Adjustments, Carl's Diner, Place's Deli, LIHP's, Casey mini warehouses and West Milford Garden Center.

In the Oak Ridge-Rte. 23 area, major projects that have been constructed include, Lakeland Plaza, Alexander Hamilton S & L, George Strus property (restaurant-stores) a number of commercial uses and renovations on Rte. 23 north of Clinton Road and Service Concrete offices.

There were scattered commercial buildings in other areas of the Township as well as numerous additions to existing facilities.

Industrial

The degree of industrial development was significant relative to the amount of land zoned LMI within the Township (690 ac.). Major projects included; Braun and Settineri Industrial Buildings - Union Valley Road, Jean Carol - Union Valley Road, Baley Cable (Newfoundland), Stamato, Ryam Machine Co. (Macopin Road) and Concours Auto (Rte. 23). Additions were granted for various other industrial buildings within the 7 year period.

Public and Quasi Public

This area of land use has had a significant degree of activity because of our existing status as a recreational community and because of the dramatic increase in population experienced since 1960. This is reflected by the increase in several churches. Major projects since 1977 include; Gilgal Bible Church expansion, United Methodist, Assembly of God Church,

State Land Acquisition

Public acquisition of lands in west Milford has continued. State acquisition since 1977 includes land for the Monksville Reservoir (Beech Road), the Ferber tract (Clinton Road-Cherry Ridge Road), expansion to Norvin Green (Otterhole Road) and Riggio property (Long House Road) for protection of Appalachian Trail.

The City of Newark Watershed acquired several small parcels by purchase or trading. These parcels were located along Cannistear and Gould Roads.

The Township has also acquired land through tax forclosure or gift. Significant parcels include the Fette and Gordon properties along Lakeside Road and the Sunset Lake properties near Macopin and Echo Lake Roads.

Summarization

The Planning Board would characterize the period of West Milford's history between 1976 and 1983 as emerging years. This period of growth principally saw the single family development approach to the Township's growth. Existing commercial facilities were capable of accommodating this growth with some minor additions i.e. banking facilities. Offices consisted of local service type facilities with no speculative office buildings constructed. Industrial uses were comprised of local resource related activities i.e. sand and gravel, and industrial locations that were influenced by service areas of the companies and/or residential choices of the principal owners

The CR activity showed a considerable degree of speculation that could have altered the face of the Township had they been constructed. By and large it was economic factors which prevented these from being effectuated.

Review of the development applications since 1977 show considerable interest to develop property in several classifications of land uses. However, only a small percentage of the larger proposals were constructed while many of the smaller (non-speculative) projects were completed. This indicates that although the potential development existed, the proper economic and demographic environment had not yet materialized.

POPULATION

West Milford Township is one of sixteen municipalities which comprise Passaic County. West Milford, located in the northern section of the County, borders upon Sussex County to the west, Morris County to the southwest, Bergen County to the east and Orange County, New York to the north. West Milford, along with Bloomingdale, Ringwood and Wanaque is within the "rural suburbs" of the County. This area constitutes 64% of the County's land area, and only 12% of the 1980 County population.

From 1970 to 1980 New Jersey, as a whole, experienced a 2.7% percent change in its population. During this same period Passaic County had a (-2.9)% percent change. As compared with the surrounding counties, Passaic County ranked first in negative percent growth (Table I).

In the ten year span from 1970 to 1980 West Milford ranked first in percent growth of the total county population in comparison with the other "rural suburbs" municipalities. It was during this time that West Milford recorded a percent increase of 31.5%. (Table I and Figures 1 and 2).

As of 1980 there were 22,750 people residing within the 78.6 square mile boundary of West Milford Township, or approximately 144 people per square mile. Of the four "rural suburbs", West Milford exhibits the lowest persons per square mile.

The early 1980's exhibited a slower growth pattern because of a general recession and high interest rates. However, the mid 1980's begin to show the growth characteristics of earlier periods within the Township as the economy improves and the pent up demand for housing together with the lack of vacant land in the urban counties begin to increase population growth. The last provisional census taken be the N.J. Dept. of Commerce estimates West Milford's population at 23,939 as of July 1, 1984.

With 22,750 people, West Milford has the lowest population density in the County with 290/square mile. The number of families and households reflect an overall household size of 3.32, higher than the County average of 2.9, but lower than 3.7, 1970 size. Families are two or more persons related by blood, marriage, or adoption while a household is a person or persons occupying a housing unit (Table 2). The median age of 28.6 is second youngest to Paterson (27.6). Of persons 15 years and older, 67% are married, 23% single and 10% separated, widowed or divorced.

The age of the population indicates 26% between 5 and 18 years of age and 26%, 30 to 44 years old. Ten percent are considered preschool (0-5 years old) with 8% at age 60 and over. The 65 and over age group in West Milford ranks lowest in the County with 6.3% (Figure 3).

Of the total of 6795 households, 78% consist of married couple families. One person households comprise 10.7% while other family and non-family households total 8.2% and 2.6% respectively. A total of 1099 households contain persons over 65 years of age with 831 (12.2%) having a senior citizen as head of household.

Total housing units within the Township total 8190, 7056 year round and 1134 seasonal or migratory (13.8%). Over 94% of the total units are single family homes, with 12 addresses having 10 or more dwellings (includes group homes, nursing homes, convents, institutions). Approximately 12% of all occupied housing units are rented.

The census provides some insight into the age of the current housing stock. Approximately 36% and 20% of the total housing units are greater than 30 and 40 years old, respectively (1530 total units). Of this total, 264 or 17% have been occupied by only one household or family.

TABLE 1 : POPULATION CHARACTERISTICS

Municipality	1970	1980	% Change
Bloomingdale	7,797	7,867	+ 0.9
Ringwood	10,393	12,625	+21.5
Wanaque	8,636	10,025	+16.1
West Milford	17,304	22,750	+31.5
Passaic County	460,782	447,585	- 2.9
New Jersey	7,171,127	7,364,158	+ 2.7

Source: Passaic County Profile (prepared from 1980 Census)

TABLE 2 : POPULATION CHARACTERISTICS

Municipality	Area (sq.mi.)	Persons per Sq. Mi.	Median Age (years)
Bloomingdale	9.13	862	30.4
Ringwood	27.33	462	28.7
Wanaque	8.16	1,229	30.0
West Milford	78.30	144	28.6
Passaic County	193.81	2,309	31.6
New Jersey	7,787.00	946	32.2

Source: Passaic County Profile (1980 Census Data)

TABLE 3: POPULATION CHARACTERISTICS

Municipality	Households	Persons/ Hshld	Families (total)	Housing Units*
Bloomingdale	2,591	2.8	2,133	2,649
Ringwood	3,617	2.7	3,254	3,723
Wanaque	3,007	3.0	2,617	3,077
West Milford	6,795	3.2	5,894	7,056
Passaic County	153,463	2.9	116,977	158,163
New Jersey	2,548,594	2.8	1,931,578	2,687,754

* Total year round

Source: Passaic County Profile (1980 Census Data)

Figure 1

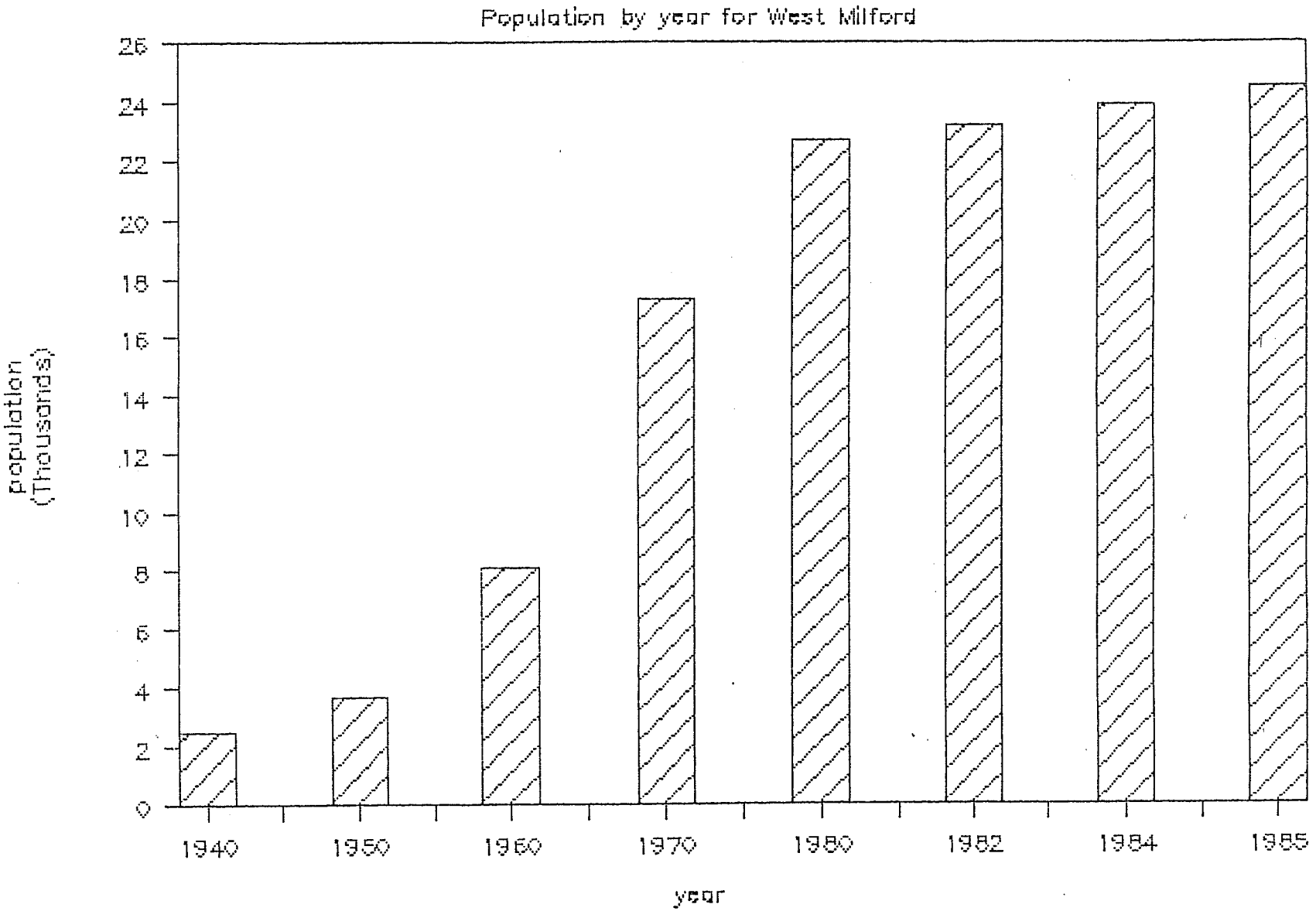

Population by year for West Milford
population (Thousands)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
1940
1950
1960
1970
1980
1982
1984
1985
year

Figure 2

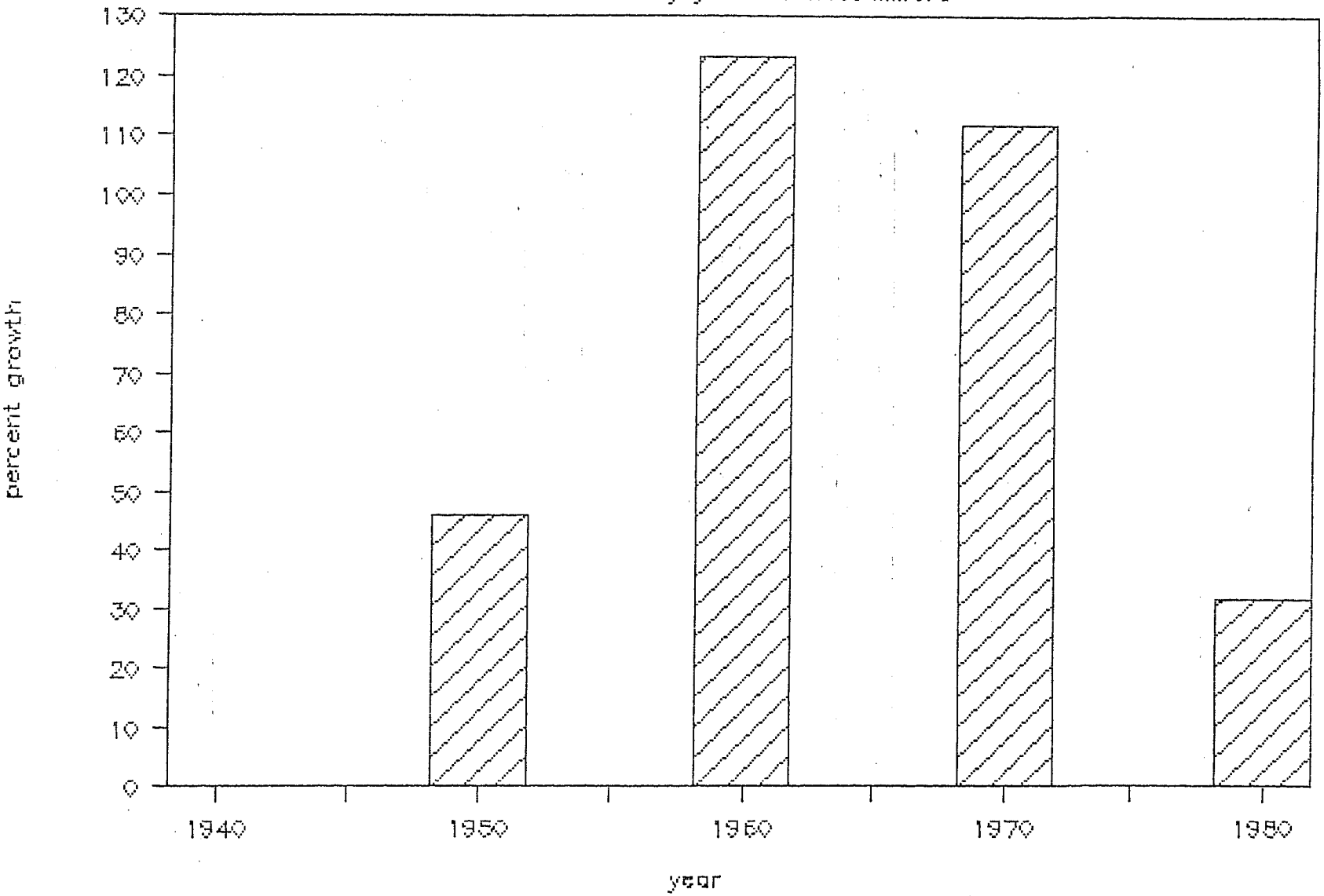
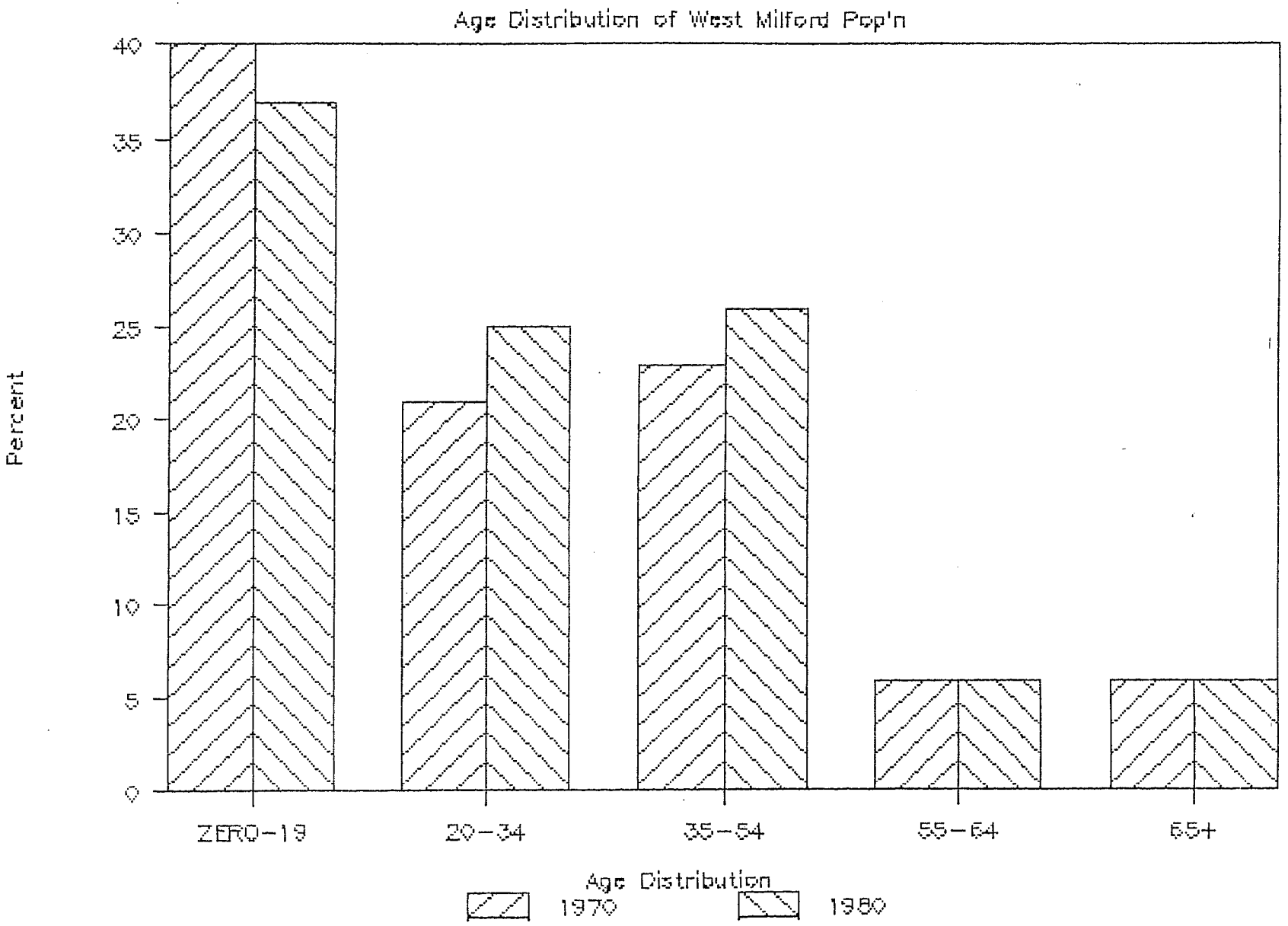

Percent Growth by year for West Milford
percent growth
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1940
1950
1960
1970
1980
year

Figure 3


Age Distribution of West Milford Pop'n
Percent
40
35
30
25
20
15
10
5
0
ZERO-19
20-34
35-54
55-64
65+
Age Distribution
1970
1980

physical character

PHYSICAL CHARACTERISTICS

New Jersey is divided into two major geographic provinces, the coastal plain and the Appalachian provinces. The Appalachian is further subdivided into the Piedmont Plateau, the Highlands and the Appalachian Valley and Ridge provinces. West Milford Township lies wholly within the glaciated Highlands province. The predominant characteristic of this region is the axial orientation of the landscape, roughly northeast to southwest, identified by the chain of Appalachian ridges such as Bearfort and Kanouse Mountains and the intervening valleys. Elevations within the Township range from approximately 650 feet in areas south and west of Greenwood Lake to approximately 1300 feet along the Bearfort Mountain. A maximum elevation of 1490 feet is reached on Bearfort Mountain, just south of Terrace Pond.

SLOPES

The effects of the geologically folded bedrock and the glacier scouring is evidenced by the rugged terrain, steep slopes, and narrow valleys. Steep slopes exacerbate the inherent shortcomings of the soils. For example, absorption or soil drainage is inversely related to the degree of slopes. Steep slopes ordinarily have poor drainage due to increased runoff. The natural evolution of soil types is also impeded on steep slopes due to the inherently limited amount of ground cover that can develop in areas of high erosion.

In areas in which the slope of the land exceeds 20 percent, development costs rise sharply along with the potential environmental problems and associated costs that could invariably result if proper attention is not paid to the treatment for hillside and mountain development.

Of the total land area of West Milford, 33 percent exceeds 15 percent slope. Significant portions of this 33 percent exceeds slopes in excess of 20 - 25 percent. These areas are ostensively located in specific areas of the Township : along Bearfort Ridge running almost the entire width of township, along the Kanouse Ridge running from Route 23 to Pinecliff Lake, and along the Wyanokie Ridge running from New York State to the area of Greenwood Lake Turnpike which is, by and large, under state ownership. An additional steep slope area is located in the lower Apshawa area, again in the area of Gordon Lake and Arcadia Lake and running along the east side of Route 23 from Butler. Map #2 indicates the topographic map of the Township. Map #3 will indicate the slopes in various areas of the Township.

GEOLOGY

West Milford has a diverse and somewhat restrictive geologic series of formations due to the glacial action on the mountain ranges and valleys. There are four general geologic formations within the Township. They include Pre-cambrian, Devonian, Silurian, and Cambrian. By far, the predominant type is the Precambrian which covers approximately two thirds of the Township running from the Kanouse ridge to the Wanaque reservoir/Norvin Green area. An additional Pre-cambrian area runs along Bearfort ridge from Clinton Reservoir to Upper Greenwood Lake to the Vernon Township line.

The second largest category is Devonian which runs primarily along the Bearfort ridge from Oak Ridge to the State of New York line and from the Clinton Reservoir-Upper Greenwood Lake area to the Union Valley Road valley. This formation covers approximately one third of the Township.

The two other categories, the Silurian and Cambrian, are very small areas within the Township. The Silurian consists of a small strip of land running from Route 23 to Greenwood Lake along the eastern edge of the Kanouse mountain range and through the town center. The Cambrian formation runs just to the east of the Silurian and consists of even a smaller band of formation running from Echo Lake to Greenwood Lake. Map #4 indicates the geologic formations within the Township. Table #4 includes a hydrologic description of each formation as described above.

The hydrologic characteristics of each of these formations will be further discussed below under both the Rutgers and Malcolm Pirnie studies.

TABLE 4 : Hydrologic Characteristics of Geology

1. Silurian - Devonian

Skunnemunk through Poxono Island - These formations have no primary porosity. Water derived from these formations must be tapped from joints, fissures and solution cavities.

High Falls - This sandstone has some, although little, porosity. The majority of the water is taken from cracks and fissures.

Green Pond - This formation has no primary porosity in most of its members. Therefore, ground water is found only in vertical cracks.

2. Cambrian - Ordovician

Leithsville - This formation is a subclass of the Kittatinny limestone. It does not have any primary porosity of its own, yet the soluble nature of the carbonate materials has afforded weak carbonic acids the opportunity to dissolve large channels and caverns. Wells drilled into the Leithsville formation stand a good chance of intersecting one of the solution channels. Water may be found under normal water table or semi-artesian conditions.

3. Pre-Cambrian - Cambrian Rocks

The Hardyston sandstone of the cambro-ordovician period is included with the pre-cambrian rocks due to its similarity with the hydrologic characteristics of the pre-cambrian crystallines. The unweathered portions of the pre-cambrian crystallines have no porosity. Almost all of the ground water found in these areas comes from joints or faults. Often, several different water tables may exist in the pre-cambrian areas, each one contained in a separate fault or fissure. Wells drilled in deeply weathered fault zones are usually a good source of domestic water.

SOILS

Soil characteristics within West Milford rely upon the underlying geologic formation and the topography of the Township. Most soils within the Township have been derived from glacial drift as well as from stream alluviam, bog materials, and bedrock. Where glacial drift is thin, soil has been developed from weathered bedrock. In high steep terrain exposures where bedrock is found, little or no soil is present.

The United State Department of Agriculture, Soil Conservation Service has provided a study in 1975 which classifies each area of the Township into its particular soils types and also lists the limitations and restrictions for various types of development associated with the soils types.

There are essentially four general groups of soils that exist within West Milford:

> "The Rockaway soil series is the most prominent within the Township. This series consists of gently sloping to very steep soils that have a fragipan in the lower part of the subsoil. These soils are dominantly moderately well drained, but in places are well drained. They are on side slopes in rough stony and rocky highland areas. Soils which are formed by glacial till are derived mainly from granitic gneiss and from lesser amounts of conglomerate sandstone and shale. Permeability is moderate above and moderately rapid below the fragipan. It is slow in the fragipan. Available water capacity is moderate. In excessively wet areas, water above the fragipan moves laterally. A seasonal perched water table is at a depth of one and a half to two and a half feet for short periods. The slowly permeable fragipan and perched water table limit the use of these soils for on-site septic filter beds. These soils are surrounded by rough and rocky areas that make accessibility for development costly and/or economically prohibitive."

Swartswood Series: The Swartswood Series is the second most prominent soil type throughout West Milford. This series consists of well drained and moderately well drained soils that have a fragipan in the lower part of the subsoil. The gently sloping to very steep soils are part of the landscape in the rough, stony and rocky highland areas. The soils are formed in glacial till derived mainly from conglomerate sandstone shale and lesser amounts of gneiss. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. As soil approaches saturation, water moves laterally above the fragipan. The slowly permeable fragipan severely limits the use of soils for septic effluent fields. Many areas of these soils are surrounded by rough and rocky land making accessibility for development costly or economically prohibitive.

Rock Outcrop: The third most prominent series within the Township is rock outcrop. This series is bedrock which that crops out on the surface. Where the outcrops are numerous, they severely limit the use of the area. Within the Rockaway soils, the outcrops make up 30 to 50 percent of each mapped area. The exposed part of the bedrock ranges from a few inches to several feet in height. The depth of the soil between the outcrops is generally less than 6 feet, but ranges to many feet. Most areas of this complex have been left in the nearly natural condition. Bedrock outcrops, shallow, stony, or bouldery soils and steep slopes are the major limitations to use.

Wurtsboro Soils: The Wurtsboro series is the fourth most prevalent series within West Milford. This series consists of moderately well drained to somewhat poorly drained soils that have a fragipan in the lower part of the subsoil and in the substratum. In this area, most Swartsboro soils are somewhat poorly drained. These gently sloping to strongly sloping soils are on toe slopes in the rough, stony, bouldery. and rocky highlands. The soils are formed in glacial till derived mainly from conglomerate sandstone shale and lesser amounts of granitic gneiss. Permeability is moderate above the fragipan and slow in the fragipan. Available water capacity is moderate. The perched water table is at a depth of one half foot to one and a half feet late in winter and early in spring. Limitations for most uses in

community development are caused by the seasonal perched high water table, the fragipan, and stones and boulders. Many areas of these soils are surrounded by rough and rocky land making accessibility for development costly.

Hibernia Series: The Hibernia series is the fifth most prevalent series within the Township. This series consists of extremely stony and somewhat poorly drained soils that have a fragipan in the lower part of the subsoil. These gently sloping to strongly sloping soils occupy areas of rough, stony, and rocky highlands. These soils are generally near drainage ways. They were formed in glacial till derived mainly from granitic gneiss and lesser amount of conglomerate sandstone and shale. Permeability is moderate to moderately rapid above the fragipan and slow in the fragipan. Water is perched over the fragipan from late in winter until early in spring. Depth to seasonal high water table is one half foot to one and a half feet. The dense, firm, slowly permeable fragipan and the seasonal perched water cause severe limitations for on-site septic filter fields. Available water capacity is moderate. Boulders and the content of stone cause severe limitations for many urban uses.

Map #5 will show the various soil types throughout the Township.

FLOODPLAINS - WETLANDS

West Milford is a headwaters community. It is at the headwaters of three major watershed basins; the Pequannock Watershed, Wanaque and Wallkill Watershed. Approximately half of the Township or 23,600 acres lies within the Wanaque drainage basin. The Pequannock watershed basin in West Milford consists of 21,550 acres and the relatively small Pochuck or Wallkill watershed consists of approximately 4,900 acres. These larger overall watersheds can be further broken down in 165 subbasins which was done in the process of the Rutgers Study which is discussed below.

The Pequannock watershed area flows generally into four reservoirs within the Pequannock basin belonging to the City of Newark. They are the Clinton Reservoir, Oak Ridge Reservoir, Charlottesburg Reservoir, and Echo Lake Reservoir. The Wanaque watershed flows into two reservoirs; the Wanaque Reservoir and upstream of the Wanaque, the newly constructed Monksville Reservoir. The Pochuck Reservoir flows into the Wallkill River valley

In addition, most of the upland streams and waterways flow into recreational impoundments, specifically, lake communities that are privately owned with the exception of Greenwood Lake which is a public waterbody. Two major rivers flowing through West Milford include the Pequannock River running along the west side of the Township and the Wanaque River running from Greenwood Lake to the Wanaque Reservoir.

Within each of these watersheds and sub watersheds are flood plain areas associated with streams. These flood plain areas were mapped out and identified in the 1981 Flood Insurance Study conducted for the Township by the Department of Environmental Protection. Within that report both 100 year and 500 year flood levels were estimated within these watershed areas. The most significant flood plain areas exist along both the Pequannock River and the Wanaque River as well as along the Belcher's Creek area which receives water from many of the most recently developed areas within the Township. The fact that a large percentage of land is publicly owned within the Township, assist in abating many of the flood problems that could exist under normal conditions. Map #6 shows the watershed and flood plain areas respectively.

Flood plain delineations are important for several reasons. First development should be avoided in areas within the designated districts because of the potential for flooding of structures and uses within those areas. The protection of life and health and welfare is a critical aspect of the control of development in those designated floodways. Further, the flood plain areas as shown, are utilized during flood events to control the level of flood waters and can act as small holding and retention areas when a flood event is realized. Filling, construction, or elimination of these areas will exacerbate downstream flooding potential within the downstream communities. Therefore, it is important to recognize these areas and to attempt to protect them from being utilized for intense development purposes. Finally, various vegetative types are associated with flood plain areas that are distinct and sometimes quite unusual. Elimination of flood plain areas would ultimately destroy vegetative species that are associated with flood plains and would change to some degree, the landscape within flood hazard areas.

Wetlands are also an important aspect to the hydrologic and hydrolic characteristics of the Township. Because of the rugged terrain and narrow valleys, a number of significant and important wetland areas exist throughout the Township. Wetlands within the Township are exclusively fresh water wetlands. These areas serve several purposes. They are extremely important for wildlife preservation of various species. They also support very distinct species of plant life as well which normally typify the typical wetland environment. Wetland areas are important from a hydrologic sense because they act as retention basins and areas that can hold a great deal of flood water in times of flooding events. Wetlands also are significant because of their ability to control various types of water pollution and it has been determined that they have the potential to act as nutrient sinks for the disposition of nitrates within stream waters. Finally, wetlands add to the diverse nature of the rural atmosphere and environment of West Milford and are an essential part of that ecosystem, not only for human habitation, but also for wildlife habitation which relies on, to some extent, wetland areas.

The US Fish and Wildlife Service has conducted a study in 1975 to map and determine all wetland areas within the entire state of New Jersey. A specific set of maps were developed which are produced as overlays to the USGS quadrangle maps. These overlays pinpoint the locations of various types of wetland areas and signify their importance in terms of classification of wetland area. This mapping system of wetlands is reproduced on Map #6.

With increasing growth pressure in West Milford, it is not inconceivable that some of these wetland areas will be threatened by development potential. Proposals to disturb wetland areas should be reviewed with the consistency of policies for preserving the natural environment. The Township has recognized this by restricting development within wetland areas through its Critical Areas Ordinance.

regional plans

STATE DEVELOPMENT GUIDE PLAN

The State Development Guide Plan was developed by the New Jersey Department of Community Affairs in May 1980. The formulation of the Plan was conducted through legislation enacted in 1961 creating the Division of Planning. A preliminary draft of the Guide Plan was presented in 1977 and modified from public comments and hearings. The Legislature has not adopted the Guide Plan which was intended to facilitate inter-agency coordination and funding decisions. However, this document received instant validity through its adoption by the New Jersey Supreme Court in its Mount Laurel decision.

The Guide Plan's emphasis was on the shifting population trends, housing and economic shifts away from the urban areas and into the suburban and rural areas of the state. The state recognized the need to preserve our agricultural and woodlands from increasing development pressure and target state funding to areas that should and could accommodate increased growth.

GOALS

There are six basic goals. They are as follows:

1.) To protect the State's air, water, wildlife, and land resources from the adverse affects of man's activities and to correct past misuses.

2.) To preserve the open space necessary for quality environment that would be adequate for the population of the State.

3.) To maintain a viable agricultural economy in New Jersey.

4.) To cluster the settlement pattern in the State in order to promote the conservation of energy, to encourage a proper jobs-housing balance, and to foster the efficient use of the State's capital facilities such as highways, rail lines, and sewer systems.

5.) To enhance the quality of life in urban, suburban, and rural areas with special priority for revitalizing older urban areas.

6.) To provide opportunities for economic expansion and new employment in New Jersey.

The growth management strategy advocates:

1.) A suitable balance between conservation and growth in New Jersey with space for both the conservation of agricultural and critical environmental areas for residential and economic growth.

2.) The conservations of areas characterized by prime agricultural soils, public open space, steep slopes, wetlands, and water supply resources.

3.) The concentration of development and supporting public investments within older urban centers and areas which are currently developed or in proximity to existing development.

4.) A policy of limited investment which neither encourages nor discourages development in the areas of the state where conservation or development priorities have not been established.

Review Factors included:

suitable for conservation	agriculturally favorable soils steep slopes public open space wetlands water supply resources
suitable for development	sewerage public water supplies highway and rail facilities intensive employment concentrations development concentrations

West Milford was identified as having extensive open space areas, steep slopes (in excess of 12%), a significant amount of watershed property, low employment concentration, and sparse existing development.

West Milford was, therefore, designated as primarily conservation. A small section of the Township in the Apshawa section was been placed into the growth area (see map #7).

Growth areas were delineated according to; location to major population and employment centers, proximity to water supply and sewer service areas, proximity to highway and rail, absence of agricultural land, public open space or environmentally sensitive land. The Plan indicates that boundaries were drawn to avoid areas of excessive environmental constraints. Therefore, there would be valid reasons to have the growth zone in West Milford reconsidered based on the above criteria.

Conservation areas were designated as areas having statewide significance. There are only two Conservation areas: The Delaware Water Gap National Recreation Area and the Skylands (West Milford, Ringwood, part of Bloomingdale, Mahwah, and Oakland).

Conservation areas are designated based on: low density development, large public holdings, major environmentally sensitive lands within or adjacent to public lands, limited accessibility. The Plan identifies our area specifically by indicating "the Skylands regions along the State's northern border - should also be considered as a significant resource to be appropriately managed and conserved by the State. Portions of this rugged area have been developed, but major tracts owned by public agencies remain for water supply and recreational uses. Due to its proximity to heavily populated areas, pressures to develop the area can be expected to intensify despite its considerable resource and recreational importance. Accordingly, it is recommended that the State, in conjunction with other levels of government, initiate and implement a management plan for the Skylands region. As with the Pinelands Plan, this would allow suitable development in appropriate locations while protecting the vital nature and recreational resources of the area."

Implementation will be accomplished through acquisition and regulatory control in addition to channeling growth inducing investment away from conservation areas. The Skylands is mentioned as an extremely critical area due to its proximity to population centers and the prospective demand for development of this land.

The Plan was scheduled for revision in 1985 by the Court. A State Planning Commission has been formulated for the express purpose of reviewing potential revisions in the Plan and for the development of a State Development and Redevelopment Plan. This event causes the above discussion of the Guide Plan to be somewhat historical. The State Planning Commission will be redefining the State Planning effort and the Township will be providing its input concerning land use designations.

REGIONAL DEVELOPMENT GUIDE 1980-2000

In 1981, the Tri State Regional Planning Commission, an autonomous planning agency under the federal government, developed its Regional Development Guide. Its intent was to provide direction to cities and towns in the region in development of land use plans. It was also to be used, like the State Development Guide Plan, to channel funds by federal and state agencies in a rational manner. The Guide was part of a comprehensive plan that included housing and transportation elements. The Commission was abolished in 1982 when Connecticut, then New Jersey, cut back on funding for the agency. It is mentioned here to provide another regional perspective on how West Milford was viewed by other agencies that conduct area wide planning services.

The Regional Development Guide goals and policies are to:

1.) conserve environmentally sensitive lands. (examples: land with severe limitations for construction; watersheds and aquifers, head-water areas, potential recreation lands, existing and proposed parks)

2.) concentrate development to revitalize older cities and to stabilize existing populations.

3.) a balance of housing choices, employment opportunities and community services.

The land characteristics indicate a large portion (over 66%) as poorly suited for construction, catchment areas for water supply and a headwater area for stream basins. The Guide designates West Milford predominantly as 0-0.5 residential units/net acre and environmentally sensitive lands in which no growth should occur. The scale of the Guide does not permit it to differentiate between sensitive and 0-0.5 unit/acre land.

Three areas within the Township are given high density ranges of 2-6.9 units/net acre. These are Upper Greenwood Lake area, Pinecliff Lake, and the Oak Ridge area.

Taken together, the Tri State Guide and the State Plan offer a regional analysis of West Milford and how it fits into the development of land within the region. Not unsurprisingly, both Plans are compatible in recommending a preservation of open space and low density development. Both Plans provide for clustering of housing in order to

preserve open space where feasible and recognize that private development is inevitable within the Township. The only major differences is Tri State's trend toward concentrating more development in the existing urban areas and calling for "infill" development densities in the three areas mentioned where the State Plan recognizes the growth of the suburbs and encourages acquisition and regulation to reduce the impact on valuable and sensitive lands.

WATER QUALITY MANAGEMENT PLAN April, 1979

Section "208" of the Federal Water Pollution Control Act amendments of 1972 and 1977 called for specified planning regions to analyze and recommend comprehensive strategies for water quality protection and improvement better known as Water Quality Management Plans.

West Milford is within the Northeast New Jersey Planning Area. A policy advisory committee, representing various factions and groups within the Planning Area had devised the following goals:

1.) protect quality and supply of surface and ground water

2.) protect quality and quantity of potable supplies

3.) guide development into sewered areas

4.) protect critical lands (flood plains, wetlands, sensitive lands adjacent to waterways, (100-500'), aquifer recharge areas, steep slopes (8%), shallow depth to bedrock soils (4'), seasonal high water table areas (0-4')

5.) encourage land use controls sensitive to water quality

With these goals in mind, the plan recommends:

1.) waste water projects which open development for large vacant land areas be discouraged

2.) establishment of a program to control changes in land areas, serving as potable water sources

3.) Green Acres funds be directed to purchase of sensitive areas

4.) DEP encroachment laws be expanded to include water quality

5.) state assume an affirmative role in natural resource management

6.) state adopt a development policy to guide investment.

The plan investigated surface water classifications in accordance with federal guidelines. Each stream was classified according to its quality and habitat potential. FW-1, 2, and 3 classifications were utilized. FW-1 streams are defined as "maintained as to quality in their natural states and shall not be subject to any man-made wastewater discharge."

FW-2 is defined as a high-quality stream capable of trout production and/or maintenance and used recreational purposes and water supply.

Within the watershed basins listed below, the following are classified as FW-1:

Wanaque -	Cooley Brook and tributaries
	Surprise Lake
	Green Brook and tributaries
	West Pond
Pequannock-	Cedar Pond
	Hanks Pond and tributaries
	Tributary to Pequannock
	3500 feet from the County line
	Lud-Day Brook downstream to
	tributary from Camp Garfield

FW-2 streams are disaggregated into trout production and trout maintenance waters. Trout production waters will support spawning and nursery propagation during the first summer. Trout maintenance will support trout life throughout the year. FW-2 streams have no heavy industrial uses within its watershed and is basically considered to be appropriate for contact recreation and for water supply purposes.

The following are FW-2 streams:

Trout Production	Clinton Brook
	Cooley Brook
	Green Brook
	Hewitt Brook
	Kanouse Brook
	Pequannock River
	West Brook

Trout Maintenance: Charlottesburg Reservoir
Clinton Reservoir
Macopin Brook
Pequannock - downstream of Jefferson
Post Brook
Oak Ridge Reservoir
Greenwood Lake
Wanaque River (Greenwood Lake to Monks Pond)

The plan further calls for protection of sensitive areas, i.e. wetlands, floodplains, recharge zones, highwater soils, erodible soils, steep slopes (12%), and wildlife habitats and the exclusion of these areas in sewerage capacity calculations. It recommends the acquisition of these areas.

WATER SUPPLY MASTER PLAN

The Water Supply Master Plan, completed in 1982, was stimulated by the 1960 drought conditions and by the findings by the State of New Jersey that the water supply issues need to be addressed. The result of those concerns resulted in the Water Supply Master Plan. This plan included an analysis of existing conditions and a plan of action.

West Milford is included in Region 1 which includes the Hackensack, Passaic, and Raritan River Basins. Currently, supply deficits exist in the Hackensack and Passaic Basins and there is a surplus in the Raritan Basin. The potential deficit under existing conditions within these basins will be 107 mgd by 1990.

The principals of the plan include:

1.) develop a comprehensive water resource management plan

2.) provide accountability and responsibility necessary for all systems

3.) effective administration of issues

4.) responsibility should be placed with the lowest level of government possible

5.) use state capital wisely

6.) state assume leadership role

7.) more state attention to areas outside Northeast

8.) utilize intra state waters for existing needs; interstate water for future needs

9.) provide system to determine supply capabilities and respond to system stress

10.) greater water conservation efforts

11.) decisions made in open public forums with public input

The outcome of the plan for surface water supply within our area included the Wanaque South Project. This project entailed an interconnection between the Wanaque Reservoir and the Hackensack system, pumping of Pompton River water into the Wanaque and the Monksville Reservoir (now being constructed). Over the longer term an additional reservoir is being considered in the area of Dunker's Pond in the Pequannock Watershed. More definitive yield studies need to be conducted to project the long term yield potential of these surface systems.

A recommendation was made for watershed protection through remedial and preventative programs, i.e. zoning controls, special watershed regulations, wetland protection, headwaters protection, development rights, and fee title acquisition.

The plan also recommends a strong water conservation program to augment capital projects, which increase overall yield. Conservation efforts fall into two classes, supply management and demand management. Supply management includes infrastructure improvements, i.e. leak detection, repair, and rehabilitation of delivery systems.

Demand management includes dealing with consumer attitudes and habits, price incentives, plumbing alterations, and water usage regulations.

Concerning the institutional setting, the plan recommends greater responsibility for small water companies (less than 1,000 customers). Similarly, it discourages private ownership of small water systems. The plan purports that those purveyors which have not planned for future needs and have maintained large deficiencies in supply should shoulder the burden of paying for capital improvement projects.

This document is designed to be dynamic in the sense that annual updates and supplementary studies will be conducted as well as a major revision every five years to continue addressing the water supply needs and issues in New Jersey.

AIRPORT HAZARD ZONE

In April 1985, a State rule was adopted in accordance with the Air Safety and Hazardous Zoning Act of 1983 to provide greater zoning protection for all existing airports. It provided that any existing airport currently considered a non-conforming use is now to be classified as a permitted use in its respective zone. In addition, the regulation restricts new construction within an "airport hazard zone", by both use and height of structures. This hazard zone was established to delineated an area around an airport with restrictive zoning in order to avoid dangerous conditions to persons or property or the obstruction to the airspace for the landing or takeoff of an airplane.

Land uses for the "hazard zone" are identified below:

Permitted	Not Permitted
Industrial	Residential
Commercial	Planned Unit Development
Open Space	Multifamily
Agriculture	Hospitals
Transportation	Schools
Airports	Major Utility Lines

A municipality may implement land uses similar to those mentioned previously as long as they are in agreement with the intent of the airport hazard zoning chapter. The municipality may not implement a land use ordinance or plan which may have the effect of allowing or promoting the creation of specifically prohibited land uses as determined by the Commissioner of Aeronautics.

The delineation of the boundaries of the "Hazard Zone" is somewhat complex and therefore only a general size of the zone is given (see map #8).

The Nairobi or Greenwood Lake airport has two runways and the limits of the "hazard zone" is quite extensive. The zone is approx. 3000' from the end of each runway and a width of 1175' from the centerline of each runway. In addition, there are height restrictions of zero development

within the first 125' either side of the runway, and then rising at a slope of 7:1 (horizontal to vertical) to a maximum elevation of 150' at the limits of the zone. These regulations are considered minimum standards for all municipalities having an airport within their jurisdiction.

This ruling requires that municipalities adopt these standards into their master plan and to develop a corresponding ordinance by November, 1986.

This will impact the Special Economic District to a lesser degree and the adjacent residential zones to a great degree. Residential development surrounds the south and southwestern borders of the airport, with a few large tracts amounting to 100 acres that are undeveloped. There has been some interest in this area which is currently zoned R-1/PN, R-3, R-4, all for residential development. Since new residential development will be prohibited within this "zone", compatible uses and a new zone must be established in accordance with the regulation. This new "zone" conflicts with the current zoning. There are a number of options in dealing with the "hazard zone":

1) The elimination of the airport would obviate the need to comply with the regulation.

2) The Township could zone the hazard area according to the permitted uses indicated above as outlined in the ruling.

3) An appeal could be made to the Commissioner for the area to be zoned for the Townships lowest residential density.

Outlined in the ruling is a procedure for an appeal process for land owners of a project that is not considered a permitted use within the hazard zone. However, there does not appear to be a procedure for municipalities.

The Planning Board's recommendation is to zone the area of Morsetown Road for the lowest possible residential density zoning since it appears to be the most reasonable use. This zoning best relates to the existing residential development, master plan, natural constraints of the land, and coincides with the intention of the ruling. The balance of the hazard zone will not effect the SED District, particularly the Jungle Habitat area since this is not slated for residential development within close proximity of the airport.

land use

LAND USE ELEMENT

Introduction

The land use element of the Master Plan is formulated from the above studies and analysis, and through the goals and policies established by the Planning Board in order to guide the future growth of West Milford.

Planning Unit

The planning unit established within this plan is the watershed subbasin developed through the Rutger's Study. Where possible, physical and social criteria were analyzed on the subbasin level or in some cases, by merging a number of subbasins. This approach incurred some minor difficulties where basin boundaries didn't conform to existing development patterns, but by and large, considers the assimilative capacity of the natural and manmade resources within each area and compares that data with the overall goals and policies of the Planning Board.

Overall Plan Philosophy

The overall direction of the Plan is to establish a Town Center with two satellite areas. This concept is developed by a combination of factors, including the existing land use patterns, the physical constraints of the land, the existing public and private open space areas, the road and transportation systems, and planning studies conducted over the past several years. The Town Center will, of course, have the majority of the community related commercial development. The higher housing densities would be within close proximity to the Center. Housing densities become lower as distance from the Center increases, in general. This is not always possible where the studies advise against the proposed pattern. Industrial development and mixed uses are also within this area or within close distance to the Center.

The two satellites would include Oak Ridge-Newfoundland Area and Upper Greenwood Lake. The Oak Ridge-Newfoundland Area is influenced by Route 23 and the existing mix of land uses along Oak Ridge Road. A limited mixed use approach is encouraged here. Upper Greenwood Lake is predominantly residential in character and it is proposed to continue that existing pattern with some adjustments.

Land Use Classifications

Nine land use classifications are proposed for the Plan. They include:

1.) Rural Residential
2.) Low Density Residential
3.) Moderate Density Residential
4.) Higher Density Residential
5.) Lake District
6.) Commercial
7.) Limited Industrial
8.) Office - Research
9.) Special Economic District
10.) Special Housing District

These designations are designed to be general in nature and to regulate and guide growth and development into the established areas. The designations attempt to be compatible with each other and to also reflect realistic land development patterns and practices.

Before land use classifications were designated, each watershed was analyzed utilizing all of the available information outlined above. An attempt was made to determine whether each subbasin exhibited attributes which constituted a more conservation or growth quality. From that basis, specific designations and densities were assigned.

Basic criteria for establishing conservation attributes can be grouped in two categories; the physical factors and the social, economic factors. Physical criteria include:

1.) steep slopes
2.) floodplains and wetlands
3.) unsuitable soils
4.) groundwater pollution
5.) FW 1 and 2 streams and lakes
6.) primary watershed lands
7.) unique vegetation and wildlife habitats

Social and Economic criteria may include:

1.) Publicly owned land
2.) absence of infrastructure
3.) lack of transportation
4.) largely unpopulated areas

Physical criteria include environmentally sensitive or fragile areas where construction would be detrimental to the land and where these environments are desirable to preserve in their present condition. The sources used to derive this

information consists of the existing Master Plan, Natural Resources Inventory, Open Space Plan, Rutgers Study and Malcolm Pirnie Study, as well as various maps completed over the years through other efforts.

Basins were identified that have the following criteria:

1.) slopes over 20% (consistent with the critical area ordinance)
2.) flood plains and wetlands
3.) from the Malcolm Pirnie Report and Passaic County Soil Survey, extremely unsuitable soils and unsuitable soils. Basins were identified as having 50% of their area consisting of extremely unsuitable soils and when extremely unsuitable and unsuitable soils constituted 75% of the land area.
4.) Basins were identified if they were characterized by Rutgers as having potential groundwater pollution problems.
5.) FW 1 watersheds were chosen as having non degradation of water quality as a primary goal of New Jersey's 208 Water Quality Studies. FW 1 streams include:

    a.) Cooley Brook. tributaries and Surprise Lake
    b.) Green Brook, tributaries and West Pond
    c.) Cedar Pond, Hank's Pond and tributaries
    d.) tributary to Pequannock River 3500 feet plus or minus from the County line
    e.) Lud-Day Brook downstream to its tributary from Camp Garfield

6.) Primary watershed lands consist of those subbasins which are of pristine nature, have little if any development and whose development could potentially have a detrimental effect upon the quality of the water supplies. This would include existing impoundments as well as proposed new reservoirs and water supplies (Monksville, Dunkers Pond, and the Pequannock aquifer). Drainage subbasins in reservoir watersheds are identified.

7. Vegetation and Wildlife support areas of the Township are a highly valued commodity. The Open Space Plan discusses the value of forested open space areas as well as wetlands. The varied plant life offers a unique habitat for an abundance of wildlife. The wide expanses of open space within West Milford

and the species it supports is atypical for a municipality within close proximity to the urban areas of the state. The forests protect and conserve valuable water and soil resources. The location of the forested areas have a direct correlation to the quality of the potable water supplies in and adjacent to West Milford. Specific areas mentioned as being significant include:

a.) Hemlock forests
b.) Evergreen plantations
c.) Uttertown Bog
d.) Cedar Pond area
e.) Buffer areas along streams, lakes and ponds
f.) Cactus Rock
g.) Sugar Maple corridor trees
h.) Reflection Lakes

The Social and Economic criteria do not relate directly to the physical attributes, but rather lie within a number of value judgments made by the Board in determining its approach to defining proper land use designations for each area. The second factor relates to the economic feasibility of encouraging or discouraging growth and is looked at within a specific time frame, perhaps a 10 year period.

1.) Publicly Owned Land is identified as having been designated fulfilling a predetermined public need by the State, County, or Local Governmental Bodies. Land could have been acquired for open space, wildlife protection, environmental sensitivity, for present or future recreational needs of the public, historic preservation, or watershed protection. these land areas should be considered for inclusion in low density areas.

2.) One basic premise of the low density land should be the absence of people within that area. The unpopulated and sparsely settled subbasins have been identified.

3. Lack of Transportation systems or roadways is another indication of potential sparse and high development areas. Where roads are non-existent or the distance to a public road system is excessive and where no new roads are contemplated, makes the subbasin eligible for a low density designation. Further, where existing roads traverse environmentally sensitive lands, the constraints of development and goals and objectives of the Board must be weighed against prospective accessibility to the road system.

4. Similarly, where public water and/or sewer facilities would not be practical or suitable for environmental purposes, land use reflective of that constraint was considered. Also, where these facilities would be scattered throughout the Township or in remote areas where maintenance or future expansion or connection to compatible systems may not be possible, consideration was given to maintaining the rural character of these areas.

When these factors are utilized, several broad based areas are identified for rural, low, moderate, and higher densities designation. The basins identified by Rutgers as exhibiting nitrate groundwater pollution potential will need special treatment by the Board which again may predominate the other factors.

In conjunction with the efforts to determine sensitive areas within the Township, the Master Plan must also define areas that are suitable for development and where development would be strongly encouraged. These areas must meet the community's needs for housing, services (both public and private),and for economic development.

Planning criteria for determining development areas include:

1) existing or expansion areas for sewer and water facilities
2) suitable soils and geology for individual systems
3) transportation systems, major road corridors and existence of mass transportation
4) existing development patterns and land uses
5) absence of public and environmentally sensitive lands

A number of developments have been constructed that incorporate both community water and sewage facilities. Malcolm Pirnie reviewed both community water systems and found only Highcrest suitable for expansion. Interconnections of the other systems are recommended but no major expansion is recommended.

Likewise, with community sewage systems, Malcolm Pirnie found that no expansion was capable with surface stream discharge. If land application was available, Milford Manor, Highview, and Eagle's Nest have expansion capabilities.

However, new community facilities could be constructed in growth areas. These systems will be high treatment sewerage facilities i.e. tertiary treatment, chlorination, denitrification and subsurface disposal. Water systems will be subject to geologic conditions and will effect densities permissible within each area.

Suitable soils and geology would determine where individual systems are likely to be feasible and to determine lot sizes within various basins. Both the Rutgers calculations of groundwater pollution levels and Malcolm Pirnie's study of densities based on soil types will be important guides to determining these densities.

Transportation, existing and new road and highway corridors are a major factor in determining growth potential. Historically, major development occurred along and adjacent to highways and major roads. The development of Rte. 23 and Rte. 80 is typical of this trend. Recently, the construction of Rte. 287 may very well have an impact on the southern portion of the Township. The designation of growth areas should be governed by the location of the major transportation corridors. The exception to this is where there is environmentally sensitive land areas or habitats that outweigh the desirability for development and where existing watersheds could be endangered or where the rural or semi-rural character of the Township would be compromised.

Growth should also be encouraged to be contiguous to or within existing developed areas (infill). To do otherwise would be to encourage scattered development patterns and sprawl type development. The concentration of new development in proximity to existing developed areas provides a rational approach to community needs and service areas as well as offering economies of scale for future public facilities and capital improvements.

Finally, intensive development should be guided away from publicly owned land and environmentally critical areas. Low density type development could be permitted within a reasonable distance of Greenwood Lake and Upper Greenwood Lake where existing higher density development prevails.

THE PLAN

These basic factors were utilized as the primary determinants to growth areas. These areas were refined and modified as part of a more detailed analysis of various basins to determine specific uses and densities such as high and medium density housing, commercial, office and industrial development together with public and recreational needs of the community.

The Rural Residential District includes park land, watershed land (public and private), recreational uses (camps, etc.) farm assessment land, and unique environments. This District also is guided by the Open Space Plan of the Township. It is the intention of the Rural Residential District to preserve the existing character of the land in its current state. The range of residential density is proposed to be generally 4 - 10+ acres. The range stems from the ability of the soils to accommodate sewerage disposal systems (Malcolm Pirnie). The Rural Residential District would also be the primary transfer zone if the Transfer Development Rights program is adopted at some future date.

The Low Density District is designed to permit large lot residential development in the range of 3-4 acres/lot. Individual water and sewer systems are assumed within the district. Low Density includes some of the overdeveloped areas for purposes of continuity of districts. The difference between the Rural residential and Low Density districts is that the Low Density encourages development, whereas the Rural Residential District does not encourage, but tolerates development on large lots. This Plan recommends that some form of clustering be studied in the future for both the rural-residential and the low density districts.

The Moderate Density District encourages single family residential development on lot sizes ranging from 1.5 to 3 acres on individual water and sewer systems. This district would permit clustering and smaller lot sizes by using central water and sewer facilities, but this district does not include multi-family development and attempts to keep the district single-family in nature.

The Higher Density District is in close proximity to the Town Center commercial area and recommends a mix of residential densities consistent with both the Rutgers and Malcolm Pirnie reports in particular. Single family development is permitted on 1 - 2 acre lots with individual systems. Clustering and central water and sewer densities

are encouraged. Multi-family development of up to six dwelling units/acre is also encouraged. This is essentially the growth district within the Township and lies within the main transportation corridors as well as the existing development patterns.

Within the PN (Planned Neighborhood) zone, two additional issues need resolution. Although the highest density allowable is 6 dwelling units/acre, the Rutgers study indicates the 4 dwelling units/acre is a more appropriate and reasonable density. This is based on water supply considerations within the basin. It is recommended that this density be considered within any subsequent zoning revisions.

Secondly, a reasonable minimum lot size for townhouse construction was reviewed. Both approved projects thus far (Bald Eagle and Williamsburg) have land areas of 97 and 75 acres. Two potential projects should include 150 and 250 acres. The prospect of a small townhouse development on a project-by-project basis would be less desirable and be contrary to the Planned Neighborhood concept of establishing neighborhoods. Infrastructure costs, necessary with PN projects, are prohibitive in developing small lots. Therefore, it is recommended that PN development have a lot area minimum of fifty acres.

The Lake District designation is a response to the Rutgers Study determination that several watershed subbasins were in jeopardy of eminent pollution of the groundwater potable supplies. This was based primarily upon the estimated level of nitrate pollution from conventional septic systems and carries with it the specter of other deleterious organic substances. These areas, with several exceptions, are the lake communities.

The Planning Board has reviewed and discussed options for land use densities within the Lake District. They include:

1.) prohibiting additional development in these watersheds

2.) providing an interbasin off-site public water supply

3.) providing a sewerage collection and treatment system on a community or neighborhood basis

4.) instituting TDR's in these areas to preserve this land and transfer development to watersheds with excess capacity.

5.) revising performance standards to require alternate treatment systems that do not contribute nitrates to groundwater

Option 1 is not feasible without some compensation to the property owners. That compensation could be TDR's, but that will be discussed below. Simply prohibiting any development is not a viable option under present conditions.

Option 2 and 3 are not short term possibilities and are marginally feasible in the long term. A great deal of the Municipal Utility Authority's role will be dependent upon its takeover of the newly constructed sewerage treatment plants and water systems. At this point, we cannot assume the MUA will play a significant role in providing water and sewer facilities on a community basis.

Option 4 of using the Transfer Development Rights program within the overdeveloped areas is feasible and will be contingent upon further study subsequent to the Master Plan adoption. It had been suggested that these areas could be utilized as infill development areas where TDR's could be transferred under the right conditions. It was not anticipated that existing vacant land within established neighborhoods would be precluded from development. Of course, this could change if sufficient areas were designated as growth districts as part of the TDR analysis.

Option 5, utilizing alternative systems which attempt to eliminate nitrate pollutants to groundwater could be acceptable. This would need to include grey and black water treatment. The economic impact of this option would require examination. Also, the maintenance issue would need discussion with possibly the MUA having a role in this area.

These options cannot be fully explored within this document. In the interim, a meaningful, yet reasonable lot size needs to be established within the lake districts. The existing extremely small lot sizes make this task a difficult one, yet continuation of extremely small lot sizes, portend future health and safety issues within these communities.

The Rutgers Study also indicates the population potential based on the available water supply within the various subbasins. If we utilize this measure as the

ultimate capacity, the following lot sizes are recommended:

Basin	Community	CPC Lot	(IN ACRES) Exist	Recommd
1.64	Trails End	0.9	0.30	1.0
1.67	Wonder Lake	0.5	0.28	0.5
1.70	Highcrest	1.4	0.38	1.0
2.03	-----	1.3	0.28	1.0
2.04	Shady Lk.	0.1	0.22	0.5
2.13	Mt.Gln-Lndy	0.3	0.40	0.5
2.14	Lindy Lk.	full	0.30	0.5
2.42	Pinecliff	0.6	0.28	0.5
2.43	Pinecliff	0.7	0.24,0.31	0.5
2.47	Cottage Cove	1.7	0.30	1.0
2.56	Lakeside	0.3	0.31	0.5
2.57	Lakeside	1.0	0.31	0.5
2.60	East Shore	1.0	0.31	0.5
3.07	UGL	0.4	0.2,0.23	0.5

Finally, within all residential zones, the "grandfather clause" issue should be discussed in light of the above. There are significant loopholes in this provision which exacerbate the proliferation of small lots, especially within the lake communities. The Planning Board and Council need to review this policy in order to assist in implementing the lot sizes recommended above.

Commercial Areas

Commercial areas are vital to support and serve the residential districts within the Township. If they are located properly, the residential neighborhoods will financially support the business districts, especially the small localized business areas. Three types of business areas will be discussed:

Neighborhood Centers
Community Centers
Regional Centers

The neighborhood centers consist of areas that provide convenience goods and personal services. These centers concentrate on small quick stop type goods and services catering to one or a few neighborhoods. The service area in West Milford is 2 - 3 miles in radius. The minimum population supporting these centers is approximately 4,000 and the minimum site area is 4 - 8 acres.

The expansion of existing neighborhood commercial centers and the establishment of new centers is almost totally dependent upon residential development (existing and proposed) and transportation routes. In areas where no new development is projected, expansion and viability of commercial uses is suspect. An example of this might be at the Macopin/Germantown/Weaver Roads intersection. Similarly location of a facility on a local road without other valid reasons would prove fatal. Likewise, "marginal" uses on the County roads have been sustained from the draw of local and regional traffic.

The Oak Ridge area neighborhood needs are met either by the establishments along Oak Ridge Road in West Milford and Jefferson or on Route 23. In addition, several smaller commercial establishments exist in the area of residential development on Oak Ridge Road. Overall, major residential development is not anticipated.

Similarly, in Newfoundland, no major development of residential uses are anticipated. The major draw for this area is the highway and the Park and Ride site. The only exception to this would be the Idylease complex which may be developed at some future date.

In Apshawa, the existing lake communities are serviced by the Butler commercial areas to the south and the Westbrook area to the north. No substantial commercial development is anticipated.

In the Westbrook/Macopin area, substantial development exists and continued development is anticipated. An existing neighborhood center exists currently at the Otterhole/Westbrook intersections. The continued development of Olde Milford, Highview, Rockburn, Hillview and others should stimulate a demand for more commercial space. It would, therefore, be suitable to consider expanding the neighborhood commercial district in this area.

On Greenwood Lake Turnpike near Awosting Road is an existing commercial area that ostensively relies on transient traffic to support it. To some extent this area is overshadowed by its proximity to the Greenwood Lake shopping area which takes most of its attraction. Although no major single family residential development is expected, the development of Jungle Habitat could have a significant impact upon this area for convenience goods.

The R-1/PN zone along Union Valley Road is an area that is and will be experiencing rapid intensive residential growth. The present estimate is in the area of 2000 dwelling units. Even though it is in close proximity to the Town Center, a small neighborhood center could be accommodated to provide convenience goods and reduce the

traffic volumes in the Center. This commercial area could be established in the PN development process as permitted by the ordinance. The Hines tract frontage could, as an example, serve as such an area.

Similarly in Upper Greenwood Lake, the anticipated degree of infill development coupled with the increase in traffic volumes from Vernon and Warwick lend this area to commercial expansion for neighborhood and transient needs. The most suitable area would be located along Warwick Turnpike. The projected future population, however, is more difficult to quantify than above.

The community centers are recognized as neighborhood centers with a full food store and shopping goods (i.e. clothes, appliances)/ The Town Center acts as the community center and includes the CC areas between A & P and Shop Rite. The demand for more commercial space has stimulated increased activity within this area and it may be appropriate to expand the CC area. Several options exist:

1.) expand the area between Greenwood Lake Turnpike and White Road along Union Valley Road

2.) expand the area on Greenwood Lake Turnpike from the firehouse to A & W including the RMH zone tract and then along Marshall Hill Road to the Dairy Queen.

3.) expand the zone along Marshall Hill Road at West Milford Lakes.

There should also be a separation between the two anchors in the commercial area, the A & P and Shop Rite. The logical area for this is the area of Herbert's farm and Wallisch's farm. These two properties make an ideal buffer and will enable the Town Center to retain its rural atmosphere and environment.

The Town Center continues to be more than a community facility. It draws from nearby areas of Vernon, Warwick, and Ringwood. As West Milford and these areas continue to develop, the need for additional services i.e. department store and additional clothing retail stores will become imminent. The Town Center Area should provide appropriate land where this development can occur in harmony with existing uses.

The Highway Commercial area exists along Route 23 and along Greenwood Lake Turnpike. Through the discussion above, this Plan would propose to change the Greenwood Lake area district to neighborhood commercial.

A review of the existing zoning ordinance also reveals that similar uses are permitted in the CC and HC zones. Therefore, the review of the zoning criteria should refine the HC zone and classify commercial areas as neighborhood and community commercial or highway related.

Office uses are incorporated within the Commercial Districts. It was determined that a separate office commercial zone was not warranted based on past experience and the desire to achieve a Town Center concept that would integrate commercial and office uses.

Concerning regional commercial areas, West Milford is not currently in a position to support the Willowbrook or Paramus type of development. The population within West Milford and the surrounding areas are not sufficient. Basically, a population of 100,000 is required together with a minimum of 30 acres of land and 400,000 square feet.

Secondly, major highway access must be available for such regional centers. The property along Route 23 is ostensively owned by the City of Newark as watershed land. This land is not immediately available for this reason. A few private parcels may be available, but suffer from size, access and/or environmental problems.

Industrial Parks, LMI and Office-Research zones

The industrial and manufacturing areas reflect two essential factors, existing land use and locational criteria for new LMI uses.

Existing LMI uses along Burnt Meadow Rd., Airport Rd., Edgar Dr., Union Valley Rd. and Oak Ridge Rd. dictate a continuation of these zones as LMI. The planning considerations in these areas should concern any possible expansion in these districts. These factors will be discussed together with locational and planning criteria listed below. For any Industrial facility, particularly for office and industrial parks, special overall factors need to be analyzed prior to site specific analysis. They include;

1) EXPECTATION OF GROWTH IN THE AREA, both residential and non-residential --- the potential for growth is good within the Township and its surrounding communities due to general outward migration of the urban population along transportation corridors. This trend will be encouraged by the Rte. 287 completion through Passaic and Bergen Counties.

2) A NEARBY HIGHWAY OR EXPRESSWAY SYSTEM --- the completion of Rte. 287 will increase the demand for commercial and industrial land uses in the entire area. The precise demand is somewhat predicated by the time factor to and from the interchanges and the availability of land along these routes.

3) POPULATION GROWTH AND COMPOSITION --- population growth will be significant given the current economic conditions with housing being available for a wide range of family incomes. Community services and educational systems are excellent and will encourage population growth. Adjacent communities also offer housing, from Smoke Rise and Kinnelon to more urbanized areas like Butler.

4) COMMUNITY ATTITUDES AND ECONOMIC PRESSURES --- expanding clean industries i.e. research and development, computer products and non-polluting manufacturing processes are uses that the community as a whole could be willing to accept. This is obviously due to the sensitive nature of the natural resources and to the lack of central sewerage and water facilities. The economic pressures that may come with the advent of Rte. 287 could create an atmosphere for further zoning amendments to permit additional land to be utilized for non-residential uses. Finally, the City of Newark may also seek to develop some of its land below the reservoir watershed boundaries which may necessitate some zoning accommodation.

5) TYPES OF INDUSTRIES THAT ARE EXPANDING --- the overall industrial base in the region has changed dramatically over the past 20 years. The heavy manufacturing uses have been substantially reduced due to factors too numerous to mention here. In its place, a service industry has blossomed to become a significant land use within the region. This includes office facilities, research and development areas and light manufacturing and distribution parks. It is this market which should be tapped and which should be planned for through the master plan. These uses, for the most part, are compatible with the other criteria mentioned above. However, there will still be a need for the housing of the construction industries within the Township i.e. construction yards, contractors storage yards and trucking facilities. Appropriate areas for these uses should also be planned.

SITE SPECIFIC FACTORS

1) AMOUNT OF LAND -- for individual uses the 3 acre minimum is satisfactory. This size promotes smaller LMI uses with an opportunity to expand to some minor degree. Much of the 3 acre LMI land with limited constraints, is occupied. For industrial parks, 25 to 50 acres are appropriate acreage requirements. Consideration could be given for establishing an industrial park area with a 25 acre minimum with 2 acre lots and an office research area with a 50 acre minimum having 5 to 10 acre lot sizes. The former district provides for typical small and moderate industrial uses including contractors storage etc. while the latter encourages more office, research and development and distribution uses (i.e. prestigious parklike environment).

2)ACCESS -- major roadway access must be available to sustain an industrial area. Proximity to highway and expressway interchanges is critical to transportation oriented industries. Time of travel as well as distance is important. The Rte. 23 corridor is most favorable in meeting this need as opposed to the Greenwood Lake Tpke. area.

For industrial uses which are more locally oriented i.e. small manufacturing or construction industry uses, land which is not located directly along major thoroughfares may not be required. In these instances, small more localized industrial park areas can be considered providing there is no significant interaction of these uses with established residential uses and the areas are compatible to overall planning criteria.

3) PHYSICAL CONSTRAINTS -- the tract that is chosen for intense office or industrial development must be free of most environmental constraints. Steep slopes, floodplains, wetlands, rock outcropping and unsuitable soils should consume only a minimal area. These areas can be utilized as scenic and open space benefits to an overall park development. Appropriate zone districts and performance standards are the keys to preventing environmental damage and establishing aesthetically pleasing industrial facilities.

4) UTILITIES -- all sites should have electric service available and the Township should investigate requirements for various uses and the impacts of those requirements. Gas service is desirable. On an individual basis, septic is determined by water usage and should be recalculated with changes in use. Well yield could be a determining factor to support the development or type of specific uses. In office or industrial park settings, a central sewer systems should be contemplated to accommodate either the smaller lot sizes or the increase scale of development.

RECOMMENDATIONS

Based on the above criteria, the Land Use Element recommends industrial or office research districts for the following areas;

1) Oak Ridge Area

a) small expansion of the existing industrial area including Story Land.

2) New City - Germantown Rd.

a) keeping the presently designated LMI area with some minor changes in the Germantown Rd. area by removing the Newark parcel behind the Marchiafava tract and redefining the LMI area in New City to draw it away from existing residential uses.

3) Sunset Lake - Echo Lake Rd.

a) designating the Township owned property in this area (180 ac.) and an additional 134 ac. owned privately and by the City of Newark as an office - research park.

4) Greenwood Lake Tpke - Marshall Hill area

a) small expansion of the LMI along Burnt Meadow Rd.

b) keeping the present Edgar Rd.- Marhill Rd. LMI.

Commercial Recreation is not designated in the Plan to a specific area. Rather, it is proposed to become a floating zone which would be permitted within the low density or rural residential districts. Performance standards, to be adopted, will determine suitability to development of commercial recreation uses. Again, lot size minimum standards will be an important aspect to the commercial recreation criteria.

SPECIAL ECONOMIC DISTRICT

One area of the Township has always had a special unique character and uses associated with it. That area includes the Jungle Habitat and Airport properties along Airport Rd. The recreational facility has been closed for over 10 years while the airport remains operational, but no services are provided. Overall, there are approximately 1200 acres of land available. Land uses on the periphery of the sites include industrial and residential, but is primarily vacant land. The airport hazard zone designation directly affects this area, restricting the permitted land uses. The portion of the tract on the Burnt Meadow Rd. side is extremely rugged and therefore has been included in the Rural Residential District.

The balance of these two properties are more developable and offer an opportunity to rehabilitate and/or reuse the airport facilities in conjunction with a mixed use type development scheme. Therefore, the Plan encourages the implementation of office-industrial, commercial and residential uses within the District to create a unique living and working environment that would link together the positive attributes of the designated uses while continuing to preserve environmentally sensitive lands.

The extent of each use is not detailed at this time and should be more definitively refined through the zoning process. However, it is fair to conclude that the Planning Board's intentions are to promote the non-residential uses over the residential uses.

SPECIAL HOUSING DISTRICT

The Planning Board has discussed at length the disposition of the Mobile Home Zones. The area on Dockerty Hollow Rd. has been proposed as a district which would meet the intent of the mobile home zone, but permit more conventional construction.

It is the determination of the Board, that mobile homes do not conform to the pattern and nature of the existing development in the immediate area. Nor was it the Planning Board's desire to encourage the alteration of the surrounding area through the mobile home type of development.

The original purpose in establishing the mobile home zone was to meet the Mt. Laurel rulings and specifically the ruling in the City of Newark litigation. It is the intention to maintain the spirit of the Mt. Laurel criteria within the establishment of this district.

Therefore, the following guidelines for the conversion of the area to a special housing district is established;

Special Housing District

Purpose - the purpose of this district is to encourage the construction of moderately priced or least cost housing. This district had previously been comprised of the mobile home zone. The intent of the Planning Board is to provide for housing which meets the spirit of the mobile home zone, but which housing is more conventional in nature.

To this end, a number of basic criteria for the district can be established to guide the development of the zone and meet the purposes described above.

District Criteria

1) Minimum acreage - 20 acres (to realize a minimum of 100 units)

2) Maximum density - 6 dwelling units/ acre

3) Low and moderate family set-aside - 20% minimum

4) Balance of units shall be priced at levels consistent with conventional market rate units or housing in the area and shall not otherwise be considered exclusive or luxury. Construction shall be conventional or modular subject to review of the Planning Board.

5) Community water service is required, either on site or brought in from off site.

6) Community wastewater treatment and disposal is required on site or to an existing treatment facility with adequate capacity. Final discharge in either case shall be subsurface in nature.

7) Typical townhouse development will be discouraged to foster a more unique housing design for the zone.

8) All critical areas as identified within the Natural Resources Inventory and the Land Development Ordinances must be respected.

9) This district will have an underlying zone or district which will be applicable if the criteria of the special district cannot be met. The underlying zone will be consistent with the housing densities in the area surrounding this district which is medium density in nature.

10) Water and Sewerage shall be constructed to meet the Municipal Utility Authority's criteria for public acceptance.

11) The Planning Board shall have the option to recommend that the internal road system be public roads.

COMMUNITIES

Oak Ridge

The designations in the Oak Ridge area recognize the existing land uses and Route 23-Oak Ridge Road as a major transportation corridor. Existing residential densities average 1/2 acre. The residential areas are proposed as moderate density areas. Many are predominantly developed with only infill taking place at this point. Commercial is retained along Oak Ridge Road. LMI is also retained with minor expansion to include Story Land. The City of Newark owns considerable land in the Oak Ridge area. The disposition of this land should be discussed vis a vis watershed significance.

Newfoundland

The 1976 Master Plan incorporated a major commercial zone into the residential section of Newfoundland. This plan proposes to designate this area as moderate density residential which is consistent with the existing development with a commercial area along old Route 23. Similarly, we have discussed the Idylease property and the possibility of a special use component there.

Germantown Road area - High Crest

This area is essentially overdeveloped according to the Rutgers Study. Malcolm Pirnie designates large lot sizes. Germantown Road, High Crest Lake, and lower Apshawa are designated as Rural Residential on this basis. The existing Limited Industrial Area on Route 23 (Marchiafava-Newark) is proposed to be reduced as discussed above.

Town Center

The Town Center area extends from the south shore of Greenwood Lake to Apshawa and includes many of the smaller lake communities as well as the more recent subdivisions and developments. It includes Industrial, Commercial, Higher, Moderate, and Low densities, Special Economic and Special Housing Districts.

The Low Density residential area runs from Apshawa to Carpi Lake and includes Mountain Springs Lake, along Weaver Road, Mount Glen Lakes, Shady Lake, Gordon Lake, Algonquin Waters, Lindy Lake, Kitchell Lake, Carpi Lake, and Mountain Rise. On the south it is bordered by the Rural Residential District; on the north and west, by the Moderate Density District. The overdeveloped lake communities are excluded from the Low Density Districts. A separate discussion on lakes is enclosed elsewhere in this Plan.

The Moderate Density area includes the section of the Township from Maple Road to West Milford Lakes and includes Highview, Olde Milford, Pinecrest Lake area, Ridge Road, Camp Savio, Birch Hill, and West Milford Lake. Several areas exhibited water or sewer problems so that higher densities were not feasible, particularly in the West Milford Lake watershed and between Wooley and Dockerty Hollow Roads.

The Higher Density area includes property along Union Valley Road from Crescent Park, Dockerty Hollow Road and Cahill Cross Road to Greenwood Lake and Awosting. Specific neighborhoods include Crescent Park, Bald Eagle, Terhune-Rohmer, Hines, Pinecliff Lake (overdeveloped), Collins Pond area, West Milford Lake, Greenbrook, Wallisch Estates, Reidy Place, Warwick Turnpike, and Awosting. Densities were established according to data on water supply. Central water and sewer facilities are assumed within the district according to recent practice and potential MUA action.

The existing town center Commercial area is proposed to continue its designation. Most of the area along Greenwood Lake Turnpike from White Road to Marshall Hill Road is also designated as commercial. There is an expansion of the commercial area at the intersection of Greenwood Lake

Turnpike and Marshall Hill Road. Other commercial areas include:

1.) small commercial uses along Greenwood Lake Turnpike at Awosting Road
2.) a neighborhood commercial area at the Otterhole Road-Westbrook Road-Ridge Road intersection
3.) maintenance of the commercial area at the Weaver Road-Macopin Road-Germantown Road intersection

Industrial areas include existing industrial areas; Edgar Drive and Burnt Meadow Road. There was a slight expansion of the LMI District to include Marland Breeding Farm along Burnt Meadow Rd, but excludes the asphalt plant.

The Special Economic District encompasses a portion of Jungle Habitat and the airport property. The existing industrial uses on small lots should be accommodated as permitted uses, perhaps as an underlying zone.

The Special Housing District basically calls for the conversion of the mobile home zone in the Dockerty Hollow Rd. area. However, it also recommends the inclusion of the Pinecrest Lake community which would create a more uniform development pattern if redeveloped or infilled in conjunction with development of the District.

Upper Greenwood Lake

This community is comprised of two districts. From Warwick to Bearfort Waters, the data indicates a higher density can be designated. In keeping with the character of the area and existing residential development, a moderate density has been given to that area. The moderate density limitation may also assist the downstream basin from polluting its groundwater supply.

The balance of Upper Greenwood Lake has been identified as overdeveloped by the Rutgers Study. It has been given a lake district designation because of the size of the community and to achieve a contiguous land use pattern. As stated earlier, the lakes, particularly Upper Greenwood Lake, needs special attention because of their groundwater problems and vacant small lot sizes.

other plans

RELATIONSHIP TO OTHER PLANS

In the preparation of a Master Plan, it is important to access as much background information and studies relating to a municipality in order to make intelligent decisions relating to future land use policy. It is equally important to be familiar with policies that may influence a municipalities development, namely those of adjacent communities as well as State, county and regional plans. These plans may have a profound influence in a community as witnessed in the State Development Guide Plan and its role in the Mount Laurel Decisions.

In fact, Municipal Land Use Law requires the following of each municipality, "The master plan shall include a specific policy statement indicating the relationship of the proposed development of the municipality as developed in the master plan to (1) the master plans of contiguous municipalities, (2) the master plan of the county in which the municipality is located and (3) any comprehensive guide plan pursuant to section 15 of P.L. 1961, c. 47 (C. 13:1B--15.52).

In compliance with this requirement, the plans of the adjacent communities, as well as those of the County of Passaic and the region are discussed below.

ADJACENT COMMUNITIES

West Milford, located in Passaic County, is bounded by 2 other counties and 7 communities in New Jersey, and 1 County, a Town and a Village in New York.

The adjacent counties and their respective communities are as follows: PASSAIC COUNTY; Ringwood, Bloomingdale MORRIS COUNTY; Butler, Kinnelon Jefferson SUSSEX COUNTY; Hardyston, Vernon. In New York State, and in Orange County is the Town of Warwick and the Village of Greenwood Lake.

Listed below is a composite of the Land Use Plans and Ordinances of the adjacent communities and their relationship to West Milford.

Borough of Ringwood

Most of West Milford's eastern border is shared with the Borough of Ringwood. Most of this consists of State owned property and watershed properties owned by the North Jersey Water District Supply Comm.. The zoning of this entire area is that of low density and specifically two acre zoning. This is compatible with West Milford's zoning which has identified these areas as environmentally sensitive and recommended 4 acre lots.

Borough of Bloomingdale

Bloomingdale makes up approximately 25% of the southeastern border of West Milford. Almost the entire border is identified for Public Use and Reservoir property. These uses are principally due to the large tracts held by The North Jersey District Supply Co., and that of Norvin Green State Park. The area is zoned for low density residential development, more specifically 3 acres per lot. West Milford also contains a sizable portion of Norvin Green State Park and its associated zoning is 4 acres per lot.

Borough of Butler

Butler borders West Milford along its southern most point and along Route 23. According to the 1976 State Development Guide Plan, both Butler and West Milford were considered to be in a "Growth Area". The Growth Areas were delineated by applying the following criteria:

1) proximity to a major population or employment center
2) proximity to a major water supply and sewer service area
3) proximity to major highways or commuter rail service
4) absence of a concentration of agricultural lands
5) absence of large tracts of public open space or environmentally sensitive land.

Butler does have municipal services such as public water and sewer disposal and with its access to Route 23 met many of the guidelines for a community in a Growth Area. West Milford however, does not offer any municipal services (with the exception of a small water system in High Crest Lake) and has extremely rugged and difficult lands. The designation of this portion of West Milford as in a Growth Area is reevaluated elsewhere in this plan. Butler presently has the property adjacent to West Milford's border which is zoned for light industry with a minimum lot size of 60,000 sq.ft.. West Milford presently has the area zoned for low density residential with a 4 acres per lot minimum.

Borough of Kinnelon

Kinnelon and West Milford interface at southwestern border of the Township and along Route 23 and the Pequannock River. Stretching for almost 4.5 miles of this natural boundary, most of the property is presently vacant, with some of the property held as a county park. Kinnelon's Master Plan for this area identifies this area as one to be used as open space/ recreation and large lot development. Zoning of this area presently is for residential development, with a minimum lot size of 1.5 acres per lot. West Milford's zoning for this area is for residential 4 acre per lot minimum.

Township of Jefferson

Jefferson makes up the western border of Township following the boundaries of Route 23, the Pequannock River, and Oak Ridge Reservoir. The length of this border, provides for a variety of development along it and includes large tracts of vacant watershed property, community commercial shopping areas, and residential development. Since most of the boundary is watershed lands, the Jefferson Master Plan reflects large lot development, specifically 30,000 and 40,000 sq.ft.lots. The areas that do allow for the mix of commercial, industrial, and some office development are the Oak Ridge and La Rue Road areas. The West Milford plan, also intends to continue the use of the Oak Ridge Rd. area as an light industrial area with some commercial and office/research type development. The areas not along major roadways will however, remain in residential development.

Hardyston Township

Hardyston touches West Milford on its northwestern border and along the area bordering Route 23. This area like West Milford is largely held for watershed purposes and is comprised of rugged vacant land. Hardyston's plan calls for this area to remain in rural/conservation and it is zoned for large lot development, 1 acre per lot.

Vernon Township

Vernon makes up the bulk of the northern and northwestern border with West Milford which consists of approximately 10 miles of border. Like the area which it borders in West Milford, almost the entire border is in watershed property or State parklands. This area like most of West Milford is environmentally constrained, with steep slopes, wetlands, and large amounts of rock outcroppings. Vernon's plan identifies these areas for low density development and calls for 2 acre zoning. West Milford's plan calls for low density development as well, and is presently zoned for residential predominately 4 acre lot with a smaller section along Warwick Tpke. zoned for 2 acre lots.

Town of Warwick

The Town of Warwick, located in New York State makes up the entire northeastern border of West Milford. This area, starting with the northern most point, is in rolling farmland. This extends for only a short distance before the mountainous, rugged terrain begins and extends to Greenwood Lake and beyond. A large percentage of this property, is

held by the State of N.Y. for parkland or a wildlife management areas and is traversed by the famous Appalachian Trail. Warwick has zoned the area for Mountain Residential which requires a minimum of 80,000 sq. ft. West Milford's lands, mirror Warwick's and are also predominately held by the State of N.J. for parklands. These areas are appropriately zoned and require 4 acres per lot.

PASSAIC COUNTY MASTER PLAN

The Passaic County Land Use section of the Master Plan corresponds with West Milford's current Master Plan. The County identifies it's northern sector as the "rural suburbs" of which Bloomingdale, Ringwood, Wanaque, and West Milford are all a part. These areas contain 64% of the land area of the County with only 12% of the population; with the dominant use being open space. The County views this area to be use for large lot residential development, with scattered commercial and industrial development in existing areas and along the main roads. This recommendation is due to the constraining natural features, and the abundance of State and publicly held land. This type of development will be consistent with the development in West Milford for the future.

housing

HOUSING ELEMENT

Introduction

The Housing Plan is designed to provide for the safe and decent housing and shelter for Township residents. The basic goal is to provide a wide range of housing opportunities within the Township for all income groups and family sizes.

The Municipal Land Use Law stresses that the housing plan element in the Master Plan include but not limit itself to "residential standards and proposals for the construction and improvement of housing".

The Township Land use Ordinances refer to housing generally by stressing appropriate densities and sufficient space for a variety of uses including residential.

The 1976 Master Plan recommended lot size densities based on individual lot utilities and reduced lot sizes based on community sewerage and water facilities being available. Housing densities therefore ranged from 4 acres/dwelling unit to 4 dwelling units/acre for single family development. Pursuant to the Newark zoning case, provisions were made to permit multifamily housing development up to 6 dwelling units/acre as well as permitting mobile homes to be constructed (R-3/RMH).

Recent demand for housing has been quite strong within West Milford. Construction of single family homes has increased over the past few years. Multifamily housing is also growing with the advent of the R-1/PN zone development. As land becomes more scarce in lower Passaic and Bergen Counties, the demand for housing will become more acute within West Milford and the surrounding municipalities.

THE PLAN

West Milford is predominately a single family home community. That dominance will not change with the implementation of this Plan. The unique environment and physical constraints do not permit a high degree of multifamily or small lot single family construction. The quantity of the groundwater and potential groundwater pollution issues are a primary consideration as well.

In order to meet the housing goals established above, however, consideration must be given to alternate housing opportunities. The Planning Board's observations have concluded that specific sections of the housing market have an unmet demand. They include young singles or married households, older couples and singles who are not yet

seniors (empty nesters), and senior citizens. These demands are addressed by this Plan through a variety of methods including, mixed use commercial-residential housing, garden apartments, accessory apartments and senior housing proposals.

The Housing Plan must also consider the ramifications of the Mt. Laurel decisions. The Council on Affordable Housing's mandate is to urge the Township to consider and provide housing for its low and moderate income families and households. A discussion of implementation of the Mt. Laurel requirements is included within this section of the Plan.

COMMERCIAL - RESIDENTIAL MIXED USES

One historically successful method of providing apartment housing is by utilizing the space above commercial land uses. This accomplished several objectives:

1.) It provided an alternative to garden apartment living.

2.) It was almost exclusively rental housing.

3.) It was convenient for certain demographic groups, i.e. seniors who would be near services; singles, etc.

4.) It afforded the opportunity to keep the commercial areas active after hours.

5.) It provided a certain sense of security to the commercial uses on the ground floor by having people in the building after hours.

6.) It was an efficient form of land use, allowing the opportunity to have a mix of compatible uses on one parcel.

7.) It stimulated, to a degree, growth in the commercial districts by allowing the apartments to be utilized as an economic base for the commercial uses.

These same attributes are valid and applicable to West Milford. Several commercial/residential mixed use applications have been approved recently, albeit through the use variance process. Thus far, all indications are that these projects have worked quite well.

This use, like all others, needs some degree of regulation concerning apartment size, lot size, compatibility between commercial-residential uses, and traffic-parking.

On apartment size, accessory apartments will be up to 600 square feet; garden apartments will be generally 750 square feet minimum. Therefore, a gap exists from 600 to 750 which the commercial apartments could fill. The intent is certainly to provide adequate size housing, but also discourage a great number of children in this type of setting and environment. Children would be encouraged in the garden apartment environment of the R-1/PN Zone.

Minimum lot size should be 1/2 acre as permitted within the CC Zone. Anything less than 1/2 acre begins to become constrained to provide adequate parking and a suitable living environment. On the far end of the scale, five acres constitutes a neighborhood shopping center. At this level of commercial activity, commercial and residential uses may not be as compatible as on the smaller sites. Traffic volume, deliveries, heating and ventilation requirements, waste disposal requirements, all tend to alter an acceptable residential setting.

Many of the existing commercial uses with apartments are on lots within this range.

Bearfort Shopping Center	1.4 acres
Aiello's	0.6 acres
Cardinale	1.0 acres + or -
Across from 19th Green	1.5 acres

Clearly, apartments over the Shop-Rite or A & P would not be compatible at this time. Apartments over other uses would not be ideal; i.e. auto repair, gas stations, mini-storage centers, lumber yards, etc. Any subsequent zoning provision should address this issue.

The final issue concerns where the Plan should encourage commercial-residential mixed uses. It should be restricted to the community-commercial zones. Also, apartments should not be permitted directly adjacent to Route 23. There are two specific areas where the use can be encouraged; on the Town Center CC Zone and in the CC Zone along Oak Ridge Road. Apartments have stimulated commercial growth in the Oak Ridge area and have similarly provided suitable living environments. The Town Center is the most suitable area where township services are nearby.

The third area of commercial-residential interest would be the small satellite commercial areas, i.e. Greenwood Lake Turnpike, Otterhole Road-Westbrook Road, Upper Greenwood Lake, Macopin-Germantown-Weaver Roads. I would think that these areas would also be acceptable as commercial-residential mixed uses.

Therefore, the Plan's recommendation would be to include this provision in the Master Plan and eventually in the Zoning Ordinance with the following criteria:

1.) lot size between 1/2 acre and 5 acres.

2.) apartment size between 600-750 square feet and designed not to encourage children.

3.) apartments must be compatible with the associated commercial uses and prohibit apartments in conjunction with some specific commercial uses.

4.) Commercial-Residential use be permitted in the Town Center CC, Satellite CC areas, and Oak Ridge CC, and specifically excluded from areas adjacent to Route 23.

GARDEN APARTMENTS

Currently Garden Apartments are permitted in the Planned Neighborhood zone. To date, none have been constructed largely because townhouses are also permitted within the same zone. Townhouses are easier to administrate since they are sold on the market. Apartments need to be managed by the builder or a real estate management firm. Profit and tax considerations also contribute greatly toward the townhouse trend.

Meeting the demand for rental apartments could lie within the acreage requirements for competing uses. If townhouses were restricted to minimum lot sizes of 50 acres, the residual lots within the R-1/PN zone would be encouraged to be developed as rental apartments which is permitted within the Ordinance.

The Board considered the development of separate and distinct garden apartment zones. This question involves the consideration of whether the demand for apartments can be met by other forms of apartments or scattered site multi

family rental housing. It was determined that the need for a specific garden apartment zone was not needed at this time and that alterations to the zoning provisions of the Township Land Use Ordinance could stimulate the construction of this housing type.

The issue of density is also a factor towards stimulating apartment construction. The townhouse construction is resulting in densities of 4.5 units/acre. If the rental apartment provision of the ordinance permitted the maximum density of 6 units/acre, this could encourage subsequent apartment development.

Apartment projects need to provide water and sewerage treatment. This cannot be economically done on smaller projects and yet, the thought of a 100 acre apartment project leaves a more institutionalized visual look to the community.

The Planning Board could also look towards a change of policy within the R-1/PN zone and consider requiring a mix of residential types within any development within this zone. This provision could require, for instance, a certain percentage of the total number of proposed units to be constructed as apartments rather than accept a total townhouse project.

The Plan should, however, recommend specific area and performance standards for apartment construction which may encourage innovatively designed projects. Typical garden apartment regulations could include:

Gross Density

The overall maximum density for apartment construction should be 6 units/acre.

Utilities

Every garden apartment development must be connected to the public sanitary sewer and water systems, as approved by the Township Municipal Utilities Authority. Fire hydrants shall be installed by the developer in adequate numbers and locations recommended by the Township Fire Bureau.

Setaside for Affordable Housing

For any development of rental multifamily housing, the provisions of any affordable or low and moderate housing shall apply to this use. The recommended density of this use should not deter the construction of this housing type.

Height

No building containing apartment units should exceed two (2) stories; provided, however, that in no event should any structure exceed thirty-five (35) feet in height in order to maintain the appropriate scale and character of the neighborhoods in which this use will be implemented.

Minimum Tract Size

The minimum tract size of this use is recommended to be five (5) acres to conform to the Municipal Land Use criteria and to permit apartment infill within the PN zone.

Design

Building design must be residential in character, conforming to the established character of the neighborhood and in keeping with the current residential design. Any building which is so markedly incongruous with the established neighborhood character and which is likely to produce an adverse effect on the value of adjacent property should be prohibited.

Dwelling Unit Requirements

The dwelling unit minimums are designed to be compatible with other forms of multifamily housing proposed in this document. It is also intended to provide apartment sizes which are not specified within the other zones.

Therefore, the gross floor area minimums are;

(a)	studios	600 square feet
(b)	one-bedroom unit	750 square feet
(b)	two-bedroom unit	875 square feet
(c)	three-bedroom unit	1000 square feet

ACCESSORY APARTMENTS

One of the housing options discussed by the Planning Board is accessory apartments. An accessory apartment is defined as:

a separate dwelling unit incorporated within or to become part of and existing one-family dwelling. This usually provides for separate kitchen facilities which sets the use apart from a boarding or group home.

Accessory apartments do not necessarily have to be attached and part of the primary structure. They can, for instance, be placed in accessory buildings. This can be above a detached garage or a completely separate structure (sometimes called granny flats).

The purposes of establishing accessory apartments include:

1.) provide a housing type which is affordable to the young and elderly within an established residential setting.

2.) to relieve tax and financial burden of taxpayers on larger parcels of land and particularly, to assist the elderly to remain in the residential neighborhoods.

3.) to limit sprawl type development by allowing density increases within residential districts.

4.) maximize the utilization of existing resources through use of existing water and sewer facilities with potential expansion of public facilities.

5.) to legalize and bring existing zoning violations up to the standards set by the ordinance in order to provide for the public health, safety, and welfare.

Planning Criteria

The Planning Board reviewed and developed specific planning criteria in determining the extent of how a proposal to include accessory apartments in the Master Plan should be structured. Therefore, the following criteria were developed;

Ownership - it is recommended that the property owner reside on the property which has a accessory apartment. The land owner may live in the apartment and rent the main house, but owner occupancy in some form should be required.

Occupancy and Apartment Size - any accessory apartment provision should include a discussion of the number of occupants that would be permitted to inhabit an accessory apartment. This regulation should be compatible with current state health code restrictions. The intent of accessory apartments is to keep them small to service a specific market group and to not overwhelm the principal dwelling on the site or impede the surrounding neighborhood

character. Minimum floor standards should relate to health standards. The Board recommends a 300 minimum floor area. Maximum apartment size should be consistent with the above criteria which could be expressed through a square foot requirement i.e. 600 sq. ft. or as a percentage of the principal residence i.e. 30%.

Lot Size - The Planning Board's perception of this issue is to encourage accessory apartments in existing large lot residential areas, but not to permit them in the recent subdivisions, i.e. Olde Milford, Highview etc. where the built densities are high on smaller lots (1/2 acre). Conversions in these areas could have a net adverse affect on the neighborhood character and living environment.

The Plan therefore, recommends that a one acre lot size would be sufficient to regulate the use appropriately and encourage the construction of accessory apartments.

New Houses - As a corollary to the above, another intent of this housing approach is to encourage conversion of older large homes greater than 15 years old. This accomplishes the goal of preventing an immediate neighborhood change in new subdivisions and to target the program more toward seniors who now could add an accessory unit rather than relocate out of the home. Further, new homes would be restricted from conversion to prevent new subdivisions from being designed as two family homes.

MT. LAUREL IMPLICATIONS

Present Need for Low and Moderate Income Housing Units

The first attempt to quantify West Milford's low and moderate present housing need is, first of all, based on the State Development Guide Plan designations within the Township. Approximately 98.5% of West Milford is located within the Conservation District and 1.5% or 725 acres is in the Growth Zone. An analysis of this growth area, detailed elsewhere, concluded that this land is either developed, publicly owned, or environmentally constrained. Therefore, this report will deal with the Township's obligations under the Conservation designation or its indigenous needs.

The basis for the development of this need is derived from the Mount Laurel II case and Ringwood vs. Countryside Builders. This case, heard by Judge Skillman, used several planning studies, but predominantly relied on the Rutger's reports entitled Mount Laurel II, Challenge and Delivery of Low Cost Housing.

This report utilized seven characteristics which would suggest housing need. They include:

1.) house built prior to 1940
2.) more than 1.01 persons/room
3.) lack of exclusive access
4.) lack of exclusive plumbing
5.) lack of complete kitchen facilities
6.) lack of central heat
7.) lack of elevator in 4+ story structures

Obviously only the first six factors were utilized in calculations for West Milford. According to Rutgers, any two indices or factors together would indicate a deficient housing unit.

The Mount Laurel Court suggested the present need included:

1.) dilapidated units occupied by low and moderate income persons

2.) over crowded adequate units

A review of the 1980 Census for West Milford shows the following:

40+ years + lack of central heat	0
40+ years + incomplete plumbing	49
40+ years + 1.01 persons/room (complete plumbing)	42
1.01 persons/room + lack of plumbing	10
TOTAL	101

A total of 101 units meet the deficient housing definition. However, not all of these units are occupied by low and moderate income households. The subregional data shown by the Rutgers' report indicated that 58.6% of all substandard housing within this subregion was occupied by low and moderate income households. Therefore, 59 units would meet the first criteria.

The second criteria would include post 1940 construction and overcrowding (since pre 1940 housing and overcrowding has been included above). That analysis results in 98 units.

Therefore, the present housing need for West Milford would total 157 units.

Another approach to this calculation would be to utilize the 1980 census material on a subregional level and appropriate a need for the municipality based on the proportion of West Milford's housing stock to the subregion.

The subregion included the 13 municipalities in Passaic County outside of the Paterson-Clifton-Passaic area. The deficient housing criteria would again include any two factors discussed above and any overcrowded unit, regardless of any other factor being present. That analysis shows a total of 1300 units in the subregion as being deficient. West Milford contains 11.5% of the total housing stock in the region. Therefore, its proportional need would total 150 units.

Two other factors should be considered which are unique to upper Passaic County; adequate sewerage disposal systems and water supply sources. The 1980 census indicates there are 60 dwelling units with sewerage disposal systems other than sewers or septics. Similarly, 30 dwelling units derive water from means other than public supplies or wells. I would include these in the total need calculation even though some disposal systems could be sealed systems or alternate systems.

On the other hand, not all inadequate systems are likely to have reported properly during the census.

This would bring the total need figure to 247.

Based on the above analysis and in order to remain conservative in our estimates of need (not under estimate the total need), the Plan recommends consideration of 300 low and moderate income housing units.

This number should be adjusted as West Milford generates additional jobs through commercial, industrial, and office development. This approach would be consistent with the indigenous demands and needs of the Township. Also, some of this demand can be met through the use of housing rehabilitation programs. These programs are subject to funding availability through Federal and State agencies. At this time, it is uncertain how many housing units can be provided utilizing this approach.

Contrary to the above methodology, the Council on Affordable Housing established, in early 1986, determined the low and moderate income housing need for every municipality in New Jersey. Using some of the same indices as above, the Council determined that West Milford's housing obligation was 404 units.

The Fair Housing Act, from which the Council of Affordable Housing was created, provides that all municipalities develop a Housing Plan which must be approved by the Council. An adopted Plan then protects the municipality from Mt. Laurel litigation until 1993. However, the approved Plan must be implemented by 1993.

It is not the intention of this brief discussion of housing in the Master Plan to serve as the Housing Plan for COAH. Indeed, the program is a voluntary one and if a municipality chooses not to enter the Council's program it may do so at some potential present or future risk. Never the less, this Plan does concern itself with the implementation of Mt. Laurel housing that can be utilized towards meeting the objectives of a Housing Plan.

Implementation of Low and Moderate Housing Obligations

The implementation of Mt. Laurel housing can be accomplished through a variety of methods. The Land Use Element of this Plan makes provisions for higher density residential uses, a portion of which, is multifamily housing i.e. townhouses and apartments. It is within the provision for multifamily housing that predominantly enable the Township to realize its low and moderate income housing challenge.

All zones were considered for implementation. The R-1/PN zone was considered the most appropriate zone to adequately achieve the current housing allocation. The R-1 single family zone with sewer and water facilities should not be precluded from Mt. Laurel consideration and must be further reviewed. The balance of the residential zones were not considered appropriate or necessary to meet low and moderate income obligations with the exception of the mobile home zone which will be discussed below.

The typical builders remedy from the Mount Laurel decision is 20% set-aside or four units at market prices for every one Mount Laurel unit. It was determined that a 10% requirement within the PN zone would meet the required Mount Laurel units. The Plan recommends this 10% set-aside factor.

Further considered was whether the Mount Laurel units should be implemented via a mandatory set-aside or through the utilization of density bonuses. The former merely requires a percentage of the total dwelling units to be preserved for low and moderate income households. The latter provides additional dwelling units to cover the costs to the developer of offering the units at below market prices. At the current density of 4.5 to 6 units/acre, the costs are more than offset through market units, therefore, no further incentive other than the PN density of 6 units per acre is necessary to meet the Mt. Laurel requirements.

Various methods could be used to reduce the construction costs of the Mount Laurel units. From the exterior, there should be no difference from the market units in order to be compatible with the balance of the development project. Methods to reduce construction costs could include:

1) reduce unit sizes
2) allow over-under units within the same building
3) permit more individual dwelling units per building
4) allow units with no garages
5) permit "no frills" units which are dwelling units with essential accessories, but no extra "built ins" that normally add to the purchase price.

Other methods and building techniques can be discussed and addressed by the development community and the Board as the techniques are implemented.

The Planning Board considered permitting the Mount Laurel units to be constructed "off site". The units would be constructed on another site owned by or controlled by the developer. The number of required units and the overall unit pricing would be regulated as stated above. This would allow the flexibility to the developer of building two separate projects than attempting to coordinate Mount Laurel units with market units. A major consideration is to have the affordable units built in conjunction with the market project under an agreed to phasing plan. Allowing the affordable units to be constructed subsequent to the larger project would delay and jeopardize the implementation of the Mount Laurel units.

Off-site housing allows for various types of housing alternatives, i.e. small single family housing, modular construction, etc., while it does not compromise the larger development or disturb the uniformity of building layout, design and construction. This option permits the use of other private developer controlled land or the use of public land in certain situations to provide the required housing. The negative side is sustaining long term economic stability of the homeowner's association and neighborhoods consisting entirely of low and moderate income households. There could also be an issue of social significance with divorcing the affordable units into their own community. Integration of these units with the larger project may be more socially and economically acceptable.

Finally considered was an option to permit the developer with low and moderate income requirements, to post a monetary contribution to either a local Housing Authority or a municipally sponsored non-profit housing corporation or similar entity for the purposes of constructing the required

housing. The use of a housing agency or group could result in a greater potential to couple the development with HUD or FmHA housing subsidies and grants. Perhaps the most salient negative factor is the issue of whether the housing can be constructed in a timely and efficient manner by the agency. Experience indicates that the private sector could construct the housing more efficiently and within a shorter time span than a housing agency or non-profit corporation. As an alternative for the set aside provision, the Board did not recommend this option.

In conclusion, the following recommendations were made by the Board;

1) low and moderate income housing be required in conjunction with R-1/PN development and considered in R-1 development.

2) that a 10% set aside of the total permitted dwelling units be required.

3) creative construction and development design and techniques could be utilized to encourage unit affordability

4) a developer's housing obligation must be met by constructing housing only on site. The construction must be accomplished in conjunction with the market units in accordance to an accepted phasing plan.

5) contributions to a housing agency or entity is not recommended in lieu of construction with the exception of Regional Contribution Agreements.

6) all of the above recommendations are subject to the submittal and approval of a Fair Housing Plan to the Council on Affordable Housing.

SENIOR HOUSING

There is no doubt that Senior Housing can be one of the most positive components within the Housing Element. The need can certainly be demonstrated through a detailed demographic analysis. However, even without specific analysis, senior housing would be a viable and acceptable addition to the community.

There are essentially three entities that can provide senior housing; the private building industry, the public sector through grants, loans and laws, or a combination of

the two in various forms. The private market is capable of providing housing for adults and/or seniors. This would be market housing at whatever the current housing costs happen to be at the time.

The public sector can encourage the development of senior housing through, zoning, performance criteria, special incentives; i.e. density allowances that could spur greater private interest in senior housing construction. Incentives exist, as well, through various federal and state grant and loan programs. This includes programs such as HUD Section 202 program, Section 231 program, and Farmers Home Administration Section 523 senior loan programs, HUD (Passaic County) Section 8 rent subsidy program, and New Jersey Mortgage Finance Agency mortgage subsidy program. These programs are for both construction grants and loans and for mortgage and rent underwriting programs

Of course, a joint public-private partnership is also viable through private construction coupled with a public rent or mortgage subsidy program. Each of these possibilities require further investigation and is subject to changing regulations and funding availability.

Several of our other housing programs will provide the opportunity for senior housing. Perhaps the best opportunity is through the mandatory set-asides within the R-1/PN zone to meet our Mount Laurel indigenous housing obligations. These units will be made available to low and moderate income households, without public subsidization, which certainly could include senior households.

The accessory apartment provision could also provide an opportunity for seniors through the occupancy of small apartments or through the opportunity for seniors to rent a portion of their home to reduce carrying costs. Rental apartments and Commercial/Apartment Development could also offer senior housing opportunities. Section 8 funds could also be used in these cases assuming eligibility and availability of funds.

In addition to the above programs for seniors, the Plan addresses specific zoning criteria and recommends zones where senior housing would be encouraged. Federal and state regulations offer some guidance through their criteria for siting. An ideal location would have:

1.) a relatively flat site in order to avoid excessive stairways, permit single story structures and permit easy movement through the site.

2.) suitable acreage of at least five acres being the minimum size to achieve economics of scale and neighborhood or community formation.

3.) transportation services are available for shopping, and public facilities (minibus).

4.) walking to services is possible; i.e. shopping, convenience stores, library, etc.

5.) walking to community centers is possible; i.e. Town Hall, Hillcrest, etc.

6.) water and sewer facilities are available to accommodate suitable densities.

7.) medical facilities or a doctor is nearby.

8.) recreation facilities are nearby; i.e. Bubbling Springs.

These services can either be on or off site. For large tract senior development, all services should be self contained and self supporting.

Establishing senior zones is a planning method to encourage the private market to meet the demand for senior housing. At the same time, it is a good test to determine the extent of the senior market. Of course, it also directs public expenditure of grant and loan funds as well as public awareness and input concerning location of senior housing.

In that light, the following sites have been preliminarily reviewed with the following comments by the Planning Board:

Large Tracts

1.) Cahill Cross Rd.-Morsetown Rd. - this site is approximately 100 acres and is now zoned for mobile home construction. It is adjacent to the Williamsburg Village project. This site allows for internalized services but is also within easy reach of the Town Center for outside services. Access is created through the anticipated Cahill Cross Rd. extension to Morsetown Rd.

2.) Idylease - this site consists of approximately two parcels of 90 and 10 acres separated by Union Valley Rd. It is within easy access of Rte. 23 and could also provide internalized services and transportation.

Smaller Tracts

1.) Hillcrest School - 7.75 acres - close to public center, but site restrictions, slopes. and area may restrict development

2.) White-Union Valley Roads - 10.24 acres - potentially good location - former senior housing application

3.) Adelaide Terrace - 9.1 and 8.75 acres - close to Shop-Rite, Town Hall - may have sewerage problems

4.) Town Hall-Presbyterian Church - 5.6 acres - behind church - close to Town Hall-Library, conflicts with recreation facilities

5.) Stainsby Road - 4.8 acres - close to A & P - off Greenwood Lake Turnpike - could upgrade existing residential area

6.) Schools - The Board discussed the partial utilization of several elementary schools with the consensus running against this option based on mixing school children with seniors. Utilization of future vacant and available total school facilities could be ideal and should be addressed if these opportunities become available.

7.) Churches - The Paterson Diocese has been active in the housing field, particularly in Paterson where federal grants have played an integral role in housing construction. The Diocese owns a 33.2 acre parcel straddling Nosenzo Pond Road which could be utilized as a senior housing site. Both St. Joseph's Church and Queen of Peace have limited land areas for potential housing. The Presbyterian Church was mentioned above and could be involved in this program in the future. Other churches should also be involved in the site feasibility review at some future date.

The format proposed is to create an overlay zone which would permit senior housing at a specific density determined by the Planning Board. It would also include an underlying zone which would conform to the overall zone plan and master plan and allow a wider range of land uses which is implicit in the Municipal Land Use Law.

w. m. studies

RUTGERS STUDY REPORT

INTRODUCTION

Lot size recommendations are traditionally made by land use planners after examination of a variety of planning factors. Until recently, however, no specific linkage was made between volume and the quality of water and consequent lot size. As pressures mount on existing water supplies, these considerations become increasingly important. Current planning capacity (CPC) is a measure of the ability of a region to accommodate growth and development within limits defined by existing infrastructure, or by on-site septic systems and wells. CPC calculations for on-site water supply potential are a function of the productivity of the underlying aquifer. On-site water quality impact is estimated by the dilution capability of ground water. The application of the CPC model for water supply and water quality parameters and subsequent lot size recommendations are appropriate tools in the formulation of a Master Plan document.

Selecting density limitations is quite different in wholly developed, and relatively undeveloped and rural jurisdictions. In the former, the character of the existing community has already been established, and for the most part, infrastructure - sewers, water supply lines, a road network - has been constructed. In developed areas zoning modifies and enhances the already existing physical fabric of the city. Planning and zoning for relatively undeveloped areas, on the other hand, is a creative act of establishing rules which, in turn, will direct the growth, shape, and character of the community. Although rural and suburban applications of zoning initially represented an uncritical extension of urban concepts to rural situations, the publication of Design with Nature (McHarg, 1971) ushered in an era of increasingly sophisticated environmental studies. The rapid increase in environmental data has made the planning and zoning process more sensitive to environmental considerations. At the same time, however, the information produced, while valuable, may also be difficult to interpret in the context of a given planning situation.

METHODOLOGY

Many environmental inventories classify land by using single factor maps. Such data bases provide relative rankings of development suitability. In the United States, for example, the Soil Conservation Service has prepared county level soil studies which, among other things, classify soils in terms of their suitability for septic

tanks. This classification system - slight, moderate, or severe limitations for septic uses - along with many others, represents valuable preliminary information for the land use planner. Unfortunately, however, such ranking systems are inherently based on ordinal level data and judgementally - derived classification systems. They provide no direct means to set density limits required by zoning ordinances which require interval level data. Thus, the proliferation of information can also lead to a conflicting, vague, or contradictory interpretation as one person's attempted translation of "relatively suitable" clashes with that of someone else.

In West Milford, the two most salient constraints or determinants of development are water supply and water quality. Virtually all drinking water is derived from groundwater even though there are five reservoirs and approximately 20 lakes within the Township.

PLANNING UNIT

The West Milford study is unique in that the geology, soils, drainage patterns, etc. are quite varied and diverse. Previous studies have been conducted using the geologic formation as the basic planning unit. In this case, drainage basins were utilized as the basic unit to which population estimates and land use densities would be determined. The Township was subdivided into 165 drainage subbasins ranging in size from 0.10 square miles to 1.15 square miles.

The subbasins were arranged according to their stream ordering system. A first order stream would constitute a stream at the headwaters of a major basin. Second order streams would begin at the confluence of two first order streams and third order, at the confluence of second order streams, etc. Fourth order basins either drained outside the Township boundaries or constituted overland flow into an impoundment.

The Township was disaggregated into the three primary watershed areas; Pequannock, Wanaque, and Wallkill (Pochunk) and further subdivided into minor subbasins.

WATER QUANTITY CAPACITY

The first task then, was to determine the quantity of water available to support population growth by investigating and determining the specific yields within each geologic formation. This data was derived through hydro-geologic data obtained from previous studies in identical formations in other areas. This data was then compared with New Jersey Department of Environmental Protection well records and geologic survey records. In addition, over 1200 usable well records were utilized through the Township Health Department. Over 350 records had a minimum of 4 hour well tests used to determine yield estimates. Community well data within specific subdivisions was also utilized. Finally, representatives of the U.S. Geologic Survey and the study team reviewed geologic formations in the field. Table I identifies each geologic formation and available water supply.

There are eleven geologic formations indentified throughout West Milford. Of the eleven, five have sufficient well data to make a reasonable estimate of groundwater yield. The formations and yield estimates are as follows;

FORMATION	YIELD (mgd/sq. mi.)		
	Low	Medium	High
Precambrian	100	150	200
Skunnemunk Comglomerate	250	375	500
Bellvale Sandstone	150	225	300
Marcellus Shale	193	290	386
Poxono Island Shale	135	200	270

For each geologic formation, the study utilized the average yield within the yield ranges with average rainfall. Wet or dry years would affect these yield ranges, sometimes significantly. Therefore, a more reasonable approach resulted in the use of the average yield estimates.

The Precambrian formation had the highest incidence of well testing data since its area covers more than any other formation within the Township. Yield estimates were derived by taking the median specific capacity of all acceptable well tests within that particular formation.

Within each disaggregated subbasin then, population and land use density estimates were determined using the water quantity data. The following formula was utilized for the purpose:

$$Pws = \frac{y \quad A}{Qs}$$

where Pws = population that could be supported by water supply
Y = average yield of basin in gal/day/square miles
A = area of the basin in square miles
Qs = water supply demand in gal/capita/day = 100

Each of the 165 subbasins was then given a population threshold which could be supported through groundwater yields which are shown in the tables enclosed.

However, the more restrictive constraint for population growth is the effect of population growth and development upon groundwater quality when both individual wells and septic systems are utilized.

WATER QUALITY CAPACITY IN NONSEWERED AREAS

The operation of domestic septic systems adds sewage to the soils and eventually can alter the composition of groundwater. Properly functioning septic systems are designed to control most biological problems associated with wastewater disposal. Although virus organisms frequently survive passage through the septic tank, they migrate only a few inches into the adjoining soil. Consequently, these health hazards are normally minimized in well-designed systems.

Effluent from septic systems, however, can contain excessive quantities of nitrates. Common values of nitrate concentration in septic system effluent are approximately 43 milligrams per liter. This load of nitrogen-rich water can, in time, leach down to ground water. When it does, nitrate levels in the groundwater may increase above acceptable levels. Current U.S. Public Health standards for nitrates in drinking water are set a 10 milligrams per liter. In some areas of very pure water, even more restrictive levels have been established. In New Jersey, for example, the Pinelands Commission has set allowable nitrate levels in groundwater at no more than 2 milligrams per liter. Additionally, little information is available on how household chemicals react through the septic systems and groundwater.

If unrestricted development were permitted and the nitrate load on underground water supplies were allowed to increase, the 10-milligram standard would be exceeded. The point at which this could occur can be estimated, permitting, in effect, an approximation of lot size for dwellings based on septic systems. The initial application was done by Douglas and Trela of Rutgers University who developed a nutrient dilution model. The Study Team has modified the Douglas nutrient model to apply to the consolidated rock formations.

MODIFIED DILUTION MODEL

$$Dwg = \frac{I \quad C1}{640 \quad R \quad Ce \quad Qe \quad P}$$

where Dwg = development density based on water quality for septic systems (dwelling units/acre)

I = infiltration to groundwater recharge (gallons per square mile per day)

C1 = pollutant concentration limit (milligrams per liter)

640 = conversion factor (acres per square mile)

R = pollutant renovation factor (decimal fraction)

Ce = pollutant concentration in septic systems effluent (milligrams per liter)

Qe = septic system effluent generation (gpcd)

P = unit occupants (people/dwelling unit)

As the outcome of the model will vary depending on which assumptions have been made, we have listed each assumption.

MAJOR ASSUMPTIONS OF THE MODIFIED DILUTION MODEL

1.) Estimates of aquifer productivity are normally expressed as ranges for wet and dry years. Because New Jersey has undergone cyclic drought periods, we have deliberately selected estimates that reflect typical but not extreme dry year yields.

2.) The pollutant concentration limit for nitrates in potable water is 10 milligrams per liter. This is consistent with U.S. Public Health Services standards, but less restrictive than the 2 milligrams per liter recommended for the Pinelands.

3.) It is assumed that 20% of the effluent is denitrified, leaving 80% of the pollution to be renovated. This relationship is expressed as a pollutant renovation factor of 0.80.

4.) The concentration of nitrates in domestic septic system effluent is assumed to be 43 milligrams per liter.

5.) Each dwelling unit is assumed to contain 3 people.

6.) It is assumed that 100 gallons of septic effluent are generated per household per day.

The results of this application were significant in that approximately 1/2 of the total population supportable by water quantity could be sustained without exceeding the acceptable nitrate limit of 10 mg/1. This was evident throughout the entire Township.

POPULATION OF SEWERED AREAS

The population supportable in communities with existing sewerage treatment plants is dependent upon the capacity of that plant. For each community sewer plant, Malcolm Pirnie engineers had analyzed and estimated the reserve capacity and the effluent generated per capita/day. This data was utilized to then estimate the additional population that would be supported within the existing plant.

Since populations within sewered areas increase the carrying capacity of the basin, these populations are added to the non-sewered natural systems capacity to derive the total carrying capacity.

CONCLUSIONS AND RESULTS

The Study Team was careful to point out that the methodology utilized was the best available for this type of study and the area of the study. Constraints of time, economics, and Township size prohibited extensive field testing. Other limitations included the accuracy of the mapping (detailed topographic maps were not available) and the need to use estimates and judgments in rounding several factors. This study is not site specific and is not intended to be. Therefore, testing results on specific sites within the Township may be at variance with the study results. This data must then obviously be weighed with the conclusions of the data to make a rational decision concerning an application for development.

The goals and objectives of the Board or the Master Plan were not a typical part of the CPC analysis. These "value judgments" which are a vital part of the Board's development of a Land Use Plan, are taken into consideration elsewhere within the Master Plan. CPC deals more with the empirical aspects of land use densities and population. In and by itself, it does not consider open space preservation, a reasonable mix of housing densities, non-residential development, critical areas, prevention of sprawl, and future infrastructure planning. Neither is traffic impact, roads, and storm water management considered here, albeit these criteria are essential in the formulation of the overall plan. This is not a shortcoming of the study, but needs to be kept in mind when reviewing the study results.

Nevertheless, the Rutgers CPC Study is of paramount importance to the development of the Master Plan, specifically, the Land Use Element. It advises the Township of its ultimate population limits and within each of the 165 subbasins, suggests the limits to growth and development. The Study is a planning tool to which very few municipalities have access. It elevates the Plan to a higher plateau of credibility by setting the limitations of growth under various scenarios through use of our water resources. For that very reason, it is the one of the most significant ingredients in the Plan formulation.

The enclosed charts show the results of the Study. Each of the 165 subbasins is analyzed and population capacity is determined. Existing population is subtracted from the total population. Sewerage treatment plants within a basin increase the total capacity of that basin.

The findings of the Rutgers Study include:

1.) Water Quality through the impact of septic systems on the nitrate concentration of potable water supplies should be the primary factor regulating development.

2.) Water supply was available to support 164,350 people.

3.) However, the water quality constraints would reduce this capacity to 82,175 people.

4.) Capacities for the major basins include:

	Total	Additional Population
(a) Pequannock	39,072	33,739
(b) Wanaque	38,388	25,641
(c) Wallkill (UGL)	9,785	4,667

5.) The CPC total for State and County owned property totals 22,252. If you assume this land will not be developed for housing, the total CPC would be lowered to 64,545.

6.) The total CPC for City of Newark land provides for a population of 25,000. Deducting the Newark land from development would lower the total CPC to 39,545.

7.) Several subbasins are identified as being over-developed. They include:

Subbasin	1.164	Trails End, Germantown Road
	1.167	Wonder Lake
	1.170	Highcrest-Van Nostrand Lakes
	2.203	Gordon Lake
	2.104	Shady Lake
	2.213	Mount Glen Lakes
	2.214	Lindy Lake
	2.342	Pinecliff Lake (west)
	2.343	Pinecliff Lake (east)
	2.347	South Shore (Greenwood Lake)
	2.356	Lakeside (Greenwood Lake)
	2.360	East Shore (north of Awosting)
	3.207	Upper Greenwood Lake

8.) The four acre zone could accommodate 2.5 acre housing development based on the criteria studied.

9.) The existing sewerage treatment plants can accommodate 2,950 additional people.

MALCOLM PIRNIE STUDY REPORT

Malcolm Pirnie Engineering was commissioned by the Planning Board in 1983 to conduct an analysis of water supply and waste water disposal capacities. Pirnie studied "27 separate water systems supplying water to about 17 percent of West Milford's residents". The study "discusses the potential for new or expanded community water systems and the limitations on the use of individual wells."

Pirnie also analyzed "11 existing sewerage systems in West Milford, serving about 10 percent of the residents. Other residents utilize septic systems for wastewater disposal. The study looks into "the potential for new or expanded community sewerage systems and the limitations on the use of individual septic systems.

METHODOLOGY

The capacity evaluation translates available information and engineering practices into a dual measure: the population and housing densities which can be supported under specified conditions. As conditions, technologies and policies change, the capacity estimates will change.

West Milford presents a complex planning situation. Both community and individual systems must be addressed. There are many possible limiting factors for both water supply and wastewater disposal, some of which depend upon policy objectives. Some critical factors, such as septic system suitability, have small mapping units which interfere with making lot size generalizations for large areas.

WATER QUANTITY & SUPPLY

Pirnie discusses similar geologic characteristics studied by Rutgers which results in similar conclusions. The Township consists mainly of Precambrian consolidated bedrock which yields from 100 to 200 mgd/sq. mi. The balance of West Milford consists of Paleozoic unconsolidated deposits of sand, gravel, silt, and clay, common in river and stream valleys. These formations have slightly to considerably higher yields depending on the extent of sand and gravel deposits. Yields range from 240 - 350 mgd/sq. mi.

Several areas were explored for potential community water supplies. They included Charlottesburg, Pinecliff-Belchers Creek and Westbrook areas. Only Charlottesburg has

had extensive well testing. The minimum yield for community systems was set at 0.5 mgd/sq. mi. The results show the following potential yields:

Area	Yield (mgd/sq.mi.)
Pinecliff-Belchers	1.6
Charlottesburg	1.2
Westbrook	0.8

The potential wholesale use of groundwater in these areas is somewhat diminished by the need to protect the recharge areas from development and pollution degradation of the water quality. The recharge areas are adjacent to and over the potential high yield areas and control the quality and quantity of the water supply. Suggested controls include

- Groundwater management
- Septic system management
- Stormwater management
- Road salt restrictions
- Restriction of high density development
- Restriction of the presence of toxic or hazardous substances

Pirnie investigated potential surface water supplies and new impoundments. Use of the existing reservoirs is either unfeasible because of inadequate yield or the expense of delivery and treatment systems. The only possibility is a potential 1-2 mgd that may be available from Butler Water Company.

New reservoir sites were explored as well. Most of the potential feasible sites are already publicly owned, including the Monksville Reservoir. The only possibility of adequate yield outside this area is in the Westbrook area where preliminary yield estimates show that 2.2 mgd could be available.

Each community water system was analyzed by Pirnie. High Crest is the only system which can accommodate significant additional users. Systems that have excess capacity include Awosting, Birch Hill, Highview, Olde Milford, and Shady Lake and could accommodate slight to moderate increase in users.

WASTEWATER TREATMENT

Malcolm Pirnie studied the capacity of the land to accommodate individual septic systems. Conventional and alternate septic systems were considered i.e. mound and oversized beds. The nature of the soil was the constraining factor in this case. The Passaic County Soils Survey was utilized as well as data from the Township's Environmental Commission to determine suitable lot size. The disposal areas, reserve area, building area, and area for conducting surface drainage and a 200' separation area were utilized as part of the methodology.

The results recommends lot sizes by the limiting soil factors:

Category	Recommended Lot Size (Ac)
Limited by high permeability	1/2 acre
Limited by high slope	3/4 acre
Limited by shallow groundwater, shallow bed rock fragipan, or low permeability	1 acre
Unsuitable	1 to 2-1/2 acres
Extremely unsuitable	2-1/2 to 10 acres

Unsuitable and extremely unsuitable soils occupy about 70 percent of the Township's area.

EXISTING SEWERAGE SYSTEMS

The existing sewerage systems in West Milford range from a camp's seasonal system to the system serving the largest shopping center, from inadequate secondary treatment to advanced wastewater treatment. The report summarizes salient features of the treatment facilities for each system (see appendix).

Malcolm Pirnie personnel visited the larger existing plants and reviewed their operation with the MUA and the NJDEP. These observations and consultations together with the evaluations of surface discharge and land application form the basis of their assessment of expansion possibilities for the existing treatment plants. Four factors are considered in the assessment: process suitability, site suitability, land use compatibility, and effluent disposal. The results are shown in Table A-9 from the report and are discussed below.

Process suitability refers to how adaptable the existing treatment processes are to increased flows, addition of parallel units and unattended operation. Septic tanks and sand filters are not preferable for large flows or

several parallel units. The contact stabilization process requires more attention to sludge management than extended aeration. Therefore, it is rated lower. The Awosting plant was downrated from good to fair because of severe infiltration/inflow problems in the sewer system. Camp Vacamus and Marshall Hill School are rated poor.

Site suitability refers to the availability of land at an existing plant to double its capacity. Plants with sufficient vacant land are rated good. Plants with sufficient land occupied by processes which could be made more compact (generally sand filters which could be replaced by high rate filters) are rated fair. Plants without sufficient land are rated poor. Camp Vacamus, Marshall Hill School and Lappas were rated poor.

Adjacent land use refers to compatibility of wastewater treatment with the neighboring land uses. Plants with no neighbors within 500 feet except commercial or industrial uses are rated good. Plants with no neighbors within 200 feet except commercial or industrial land uses are rated fair. Otherwise plants are rated poor. Milford Manor, Crescent Park, Reflection Lakes and Marshall Hill School are rated poor.

Effluent disposal may be by surface discharge or land application. Plants discharging into streams without downstream impoundments are rated good for surface discharge. Eutrophic impoundments are rated poor for surface discharge and High Quality-Category One waters are rated very poor for surface discharge. Ratings for land application are based on the relative magnitudes of the nearest disposal site's capacity divided by the distance in feet. This provides some measure of the advantages of both proximity and capacity. The three highest ranking sites are rated good, the next four are rated fair, and the lowest four are rated poor.

Using the above criteria, the expansion possibilities for the existing treatment plants are summarized in the report. None of the existing treatment plants are suitable for expansion followed by surface discharge. However, Milford Manor, Highview, and Eagle's Nest appear suitable for expansion followed by land application of wastewater. Of course, these evaluations must be confirmed by detailed site investigations before an expansion could be designed.

The approximate capacities of the expanded facilities are as follows;

System	Population Served Existing	Potential
Milford Manor	100	1000
Highview	370	1000
Eagle's Nest	Seasonal	2000

MULTIPLE PLANTS

It is evident that many of the existing treatment plants are located within close proximity to each other. It is quite likely that future development proposals in the Township will include new plants in the vicinity of the existing ones. These considerations lead to the issue of the optimum degree of regionalization to be sought in administering wastewater treatment.

A decade ago, the policy of the NJDEP and the opinion of most wastewater professionals was that regionalization. that is a single plant serving a large area, was preferred. This policy was based on the perceived economics-of-scale and the problem encountered with smaller privately-owned facilities. Now the policy and the opinions have changed. Small plants located near the areas generating wastewater may be economical if interceptor costs are high. They also distribute the waste load in better accordance with the assimilative capacity of the receiving stream. Several small plants may be the most cost-effective alternative if they are run well. The NJDEP usually interprets this condition as run by a public agency which has wastewater treatment as its primary function such as the Municipal utilities Authority.

FOOTNOTES:

1.) The study was conducted prior to the Bald Eagle Sewer plant being constructed, therefore, it was not included in the study. That plant, designed for approximately 1000 people may have excess capacity which can be utilized in the future and may be able to be connected into other systems as development continues in the Union Valley Road corridor.

2.) As of July, 1985, Milford Manor was granted approval to double the size of the nursing home facility which should reduce this available capacity.

3.) The Highview system still has some area available within the development which would, in turn, reduce the excess capacity.

4.) Some question has been raised concerning this treatment facility's ability to meet NJDEP standards for operation. Additionally, this system relied on spray irrigation as a final disposal method which would probably be found unacceptable with conventional development.

OPEN SPACE PLAN

The Open Space Plan was prepared by the Environmental Commission in 1979 for the Planning Board to be included as an addendum to the Master Plan.

The Plan is a document that identifies the natural features and areas of the Township that are:

1.) environmentally sensitive in nature (slopes, wetlands, wildlife habitats)

2.) those of aesthetic beauty or historical value.

3.) areas that are to be used for passive recreation and buffering of developments

The emphasis of the document is the retention of the rural atmosphere of the Township by buffering developing areas with open space. The open space areas would also serve the Township as areas for active and passive recreation.

The Open Space Plan can actually be considered as a combination of the conservation and recreation elements identified in the Municipal Land Use Law - Master Plan section. These are important features - particularly in a township such as West Milford where there is much undeveloped land and increasing development pressures.

The Plan emphasized that when the growth inducing factors such as roads, condominiums and townhouse development, improved sewage technology, and population increases affect a township, that the physical limitations of the land and the social and recreational needs of the people must be considered as well.

To the casual observer, there seems to be an overabundance of open space in the Township; this is not actually the case. According to the guidelines listed in the State Development Guide Plan (SDGP) and the State Comprehensive Outdoor Recreational Plan (SCORP), West Milford was in need of additional acreage for neighborhood and community lots and play lots.

Although the State of New Jersey owns a sizable amount of property in the Township (14,552 acres - 29%), the majority of the vacant land (18,000 acres - 35%) is owned by the City of Newark as watershed property. Even with such an

abundance of open space, many of these areas have no mechanism to link them with public access to these extensive holdings. As a result, much of the Township is legally unaccessible with no easements across private property or access is not convenient to residents.

Using the concepts in the Open Space Plan, new and existing neighborhoods would have access to open space areas. This would be achieved by requiring open space dedication for development proposals as they were approved. In this way, Township growth is accommodated and the maintenance of other rural character of the Township is preserved.

The Plan emphasized that West Milford's landscape should not be frozen in time, but rather, by implementing the Plan:

1.) many natural features will be retained

2.) as growth occurs and the landscape is altered, it will be done in such as way that will not alter the unique natural character of the Township.

To ensure this, eight value factors were identified as crucial in preserving the Township's beauty. The four most important values were:

1.) steep slopes
2.) rock outcropping
3.) protected open space
4.) valuable wildlife and vegetation areas such as;
    a. Hemlock forests
    b. The evergreen plantations of the Pequannock Watershed
    c. Uttertown Bog
    d. The Cedar Bog area
    e. Buffer areas along stream corridors, lakes and pond.
    f. Cactus Rock

The other four values were identified as secondary components that could be either focal points in themselves or connectors of open space. The combination of these components would offer a variety of experiences throughout the town. They included such areas as;

1.) historic sites (table 5)
2.) active recreation areas
3.) scenic sites (table 6)
4.) trails (foot, horseback and vehicle)

Once the critical areas were identified, a strategy for preserving these areas was necessary. In Chapter IV of the Open Space Plan, various legal methods for implementing preservation of areas are discussed. Positive and negative easements, fee simple, as well as land use controls such as large lot zoning, development restrictions, and clustering can be used in ways to preserve open space.

On the final chapter of the Open Space Plan, two maps are presented as a summation of the previous material. The two maps are:

1.) a concept map indicating existing growth and the direction new growth focused

2.) a composite map of all the value factors

The composite map indicates the most sensitive areas and those of scenic beauty. Using the composite map as a guide when reviewing development applications would help to preserve the rural atmosphere of the Township.

The Open Space Plan laid a substantial foundation for the Planning Board and the Environmental Commission to work with. The next step is in trying to implement the Plan. It is in this area that the most work is yet to be done.

In 1980, a report on the economic development potential of West Milford, Commercial Recreation was listed as the area where West Milford has the most to offer. By implementing the Open Space Plan, the commercial recreation possibilities of the Township would be enhanced and sensitive areas preserved.

As down-county towns complete development, the pressures for growth in West Milford will also increase. West Milford's growth should be a well directed, well conceived plan, balancing the growth with the open space needs of the Township and the region as well.

Completed in 1979, the Open Space Plan was not available for the initial Master Plan, but is a vital component here.

TABLE 5 : HISTORIC SITES

State and Federal Register

1. Clinton Furnace
2. Long Pond Iron Works

Other Township Sites

3. Charlottesburg Iron Works 1764
4. Middle Forge 1764
5. Echo Lake Baptist Church
6. Oak Ridge Presbyterian Church 1818
7. St. Joseph's Church
8. Brown's Hotel Band Stand 1880
9. Charlottesburg Hotel 1850
10. West Milford Presbyterian Church
11. Cross's Castle 1890
12. Moe's Tavern circa 1870
13. Old Country Store 1766
14. Smith Mills 1764
15. Vreeland Store 1872
16. Wanaque Valley Inn circa 1770
17. Bigalow House (Intake Hotel) 1820
18. Carey House circa 1874
19. Cooley House 1754
20. Eckerson House circa 1815
21. Long House 1766
22. Mickens House circa 1800
23. Miller House 1804
24. Ward House 1842
25. Schofield House circa 1795
26. Terhune House 1832
27. Tichenor House 1754
28. Tichenor House 1820
29. Vreeland - Freeland Homestead 1753

TABLE 6 : SCENIC SITES

A. White Pine at Union Valley - Marshall Hill Rd. intersection.
B. Wallish Estate
C. Warwick Turnpike corridor from White Rd. to Pioneer Corners.
D. Apple Acres
E. Brown's Point
F. Reflection Lake on the south side of Union Valley Rd.
G. Dockerty Hollow Rd.

GREENWOOD LAKE STUDY

In 1983, Princeton Aqua Science (PAS) conducted a year long study of Greenwood Lake for the Greenwood Lake Watershed Management District, Inc. (GLWMDI). Under the authority section 314 of the Clean Water Act, state and federal funds were utilized to assess the:

1.) quality of the lake
2.) sources of point and non-point nutrients contributing to lake degradation
3.) to develop a comprehensive lake management plan for the protection of the lake's quality

The study identified six major problems affecting not only the lake's quality, but affecting the recreational value as well.

1.) excessive growth of aquatic weeds
2.) excessive growth of planktonic and benthic algae
3.) complete oxygen depletion in hypolimnetic waters extending up into the metalimnion
4.) accumulation of sediments
5.) presence of dangerous navigational hazards
6.) degrading fishery

The causes of the aforementioned problems are related to the development that has occurred in the watershed, particularly the impact of the storm and wastewaters associated with such development.

It is presently estimated that the phosphorus load to the lake is .74 gm -2 yr -1. whereas, the safe loading rate is estimated at .203 gm -2 yr -1. Of this amount, 9% is from wastewater disposal systems and another 56% is from stormwater.

The restoration and management of Greenwood Lake outlined in the plan has basically two components:

1.) immediate measures
2.) long term measures

The immediate in-lake maintenance measures would include weed harvesting, lake draw-downs, public education, and continued monitoring. Lake long term measures would address the causes of the problem in the lake and would include the implementation of sewage plans for Greenwood Lake Village, New York, and other communities in the lake

basin, and the development and execution of a basin-wide stormwater management plan. In addition, dredging and stabilization of Belcher's Creek, building a pollution trap in Belcher's Creek, dredging and desnagging portions of the lake, and possibly stripping hypolimnion of phosphorus, and sealing the bottom of the lake.

At present, the Greenwood Lake Watershed Management District is seeking state and federal support of the management and restoration plan. There is a Bill pending that would award a ten million dollar grant to the operation of the management plan. It is the goal of the Greenwood Lake Watershed Management District that it be the coordinator of the plan. Its hope is that it become either a bi-state planning agency, authority, or a special district, controlling the implementation of the plan for the Greenwood Lake Basin.

The implications for the Township Master Plan would include a discussion of current and future wastewater treatment facilities and their future disposition. This is discussed in the Wastewater Management Plan.

Also, the Greenwood Lake Study acknowledges the impact that uncontrolled storm water flow has had to the water quality. There are strong recommendations that steps be taken to ameliorate the negative water quality affects of development within the Greenwood Lake Watershed.

One important aspect of the plan that the Board will be addressing in the Master Plan deals with stormwater management. The Municipal Land Use Law (40:55D-93) requires that every municipality develop a stormwater plan when it is revising its Master Plan.

circulation

CIRCULATION PLAN

Introduction

The West Milford road system was established through the early development of the Township and by the need to traverse the Township to travel elsewhere. It has evolved into a road system that varies markedly, from state highway to unpaved roads.

TRAFFIC SYSTEMS

Road Classifications

Functional road classifications are utilized in order to categorize the travelled ways and this classification system permits improvements and standards to be applied in accordance to the existing and future use of these roads.

The functional classification system established by the Federal Highway Administration, provides for the following road classifications:

Interstate or State Highway - major high speed travelled way, intermunicipal and intercounty road, movement of traffic overriding priority.

Arterial Roadway - main road within jurisdiction, intermunicipal or County roads, connects collector roads or other arterials, movement of primary concern, high speeds.

Collector Roadways - service roads to local streets, usually connect to arterials, movement and access of equal priority, moderate speed.

Local Roadways - minor service roads, access to property primary concern. slow speeds.

Private Roadways - unpaved, unimproved service roads, only limited maintenance by Township, access to property only concern, extremely slow speeds.

The major roads in West Milford will include the following:

State Highway -	Route 23 entire length
Arterial -	Greenwood Lake Turnpike
	Warwick Turnpike
	Lakeside Road
	White Road
	Union Valley Road
	Marshall Hill Road
	Macopin Road
	Echo Lake Road
	La Rue Road
	Oak Ridge Road
Collectors -	Lincoln Avenue
	Westbrook Road
	Otterhole Road
	Weaver Road
	Germantown Road
	Old Route 23
	Canistear Road
	Awosting Road
	Morsetown Road
	Maple Road

County Roads

Of the arterial roadways listed above, the following are under the County's jurisdiction:

Echo Lake Road
Union Valley - (part of)
Marshall Hill Road
Macopin Road
Lakeside Road
Greenwood Lake Turnpike

Only portions of Union Valley Road are under County jurisdiction; the portion between Route 23 and Macopin Road is not a County road. No collector roadways are under County jurisdiction.

The County Planning Board and Engineer have review power over all subdivisions occurring along their roads and can require additional right-of-way reservations and physical improvements to the roadway in conjunction with this development. The County is also responsible for maintenance, snow removal, and drainage on its roadways.

The Planning Board has discussed and recommended that two roads be taken over by the County under their jurisdiction: Union Valley Road from Route 23 to Macopin Road and Otterhole Road from the Township line to Westbrook Road. Union Valley Road is an arterial road and functions as a link between Route 23 and the center of the Township similar to Macopin Road. Its function and volume would recommend a County takeover. Otterhole Road in Bloomingdale is a County road, but the jurisdiction ends at the Township line. It has the same basic function in both municipalities and should be taken over as a County road in West Milford.

Right of Way Standards

In order to provide for future needs of traffic improvements, road widening, and safety considerations, right-of-way standards should be established. These standards could be utilized to plan for future actions by requiring reservation of land in conjunction with development proposals.

The minimum right-of-way should be established at 50 feet. On collector and arterial roads there may be a need to reserve additional land since these roads will bear the greatest traffic volume and require the most improvements. The County uses a 66 foot right-of-way standard on its roadways.

The Plan recommends the following right-of-way standards:

Classification	Total	Dedicated	Reserved
Arterial	66	60	6
Collector	60	50	10
Local	50	50	-

The reservation of land refers to setting that land aside from use, but not requiring an outright dedication. The owner has the right of use within this area, however, no permanent structure or parking can be placed here. The balance of the right-of-way up to 60 and 50 feet for arterial and collector-local roads respectively, should by dedicated by legal conveyance to the Township

Roadway Standards

Throughout the State, the basic road requirements for local roads is 30 feet in width. Collectors and arterials vary with planned and needed improvements and physical conditions. In West Milford that basic standard should be utilized when considering arterial and collector roads. Further width increases will be a function of the improvements required by the Township Engineer in solving various traffic related problems.

Concerning local roads in connection with subdivision and development review, the following standards are recommended on public roads:

ZONE	PAVEMENT	CURBS	DRAINAGE
R-4	20	No	No
R-3	24	No	No
R-2	24	No	Yes
R-1	24	Yes	Yes
All Cluster, PN	20-30	Yes	Yes

Private Roads

West Milford is unique in that it has a number of private roads mostly created from the early lake development period. These roads are unpaved, unimproved, with no drainage and can be in fair to deplorable condition at times. There are rights-of way in conjunction with the roads, however, the Township has never accepted the roads. Still West Milford provides basic maintenance such as stone and grading periodically and snow removal (over 4").

In the past few years, the Township has offered a road improvement program to these various communities. The Township will provide 25% of the total cost of the improvement; the balance of 75% being assessed to the individual property owners under an established formula. Fifty-one percent of the property owners must agree to enter the program upon which it becomes mandatory for the balance of the residents.

Communities which have entered the program include: Pinecliff Lake - West Milford Lake - Gordon Lake - Upper Greenwood Lake (portion). The Plan recommends that this program continue since it has not only provided safer and more effective access to residential properties, but has stimulated upgrading the neighborhoods and increasing property values in the areas that have been done.

New Roads

As part of the circulation plan, new roads should be considered as it relates to the land use and housing elements.

New roads are necessary where existing roads cannot accommodate the anticipated growth of traffic or where improvements may be constrained by buildings and development and other physical features. This is the case of Union Valley Road through the Town Center.

As such, the Cahill Cross Road extension is proposed in this plan to move traffic around the center of town. The plan recommends that the road run from Union Valley Road at Bald Eagle to Macopin Road, follow the existing Cahill Cross Road to Peter Road, then to Morsetown Road, then through the Airport and Jungle Habitat property to the intersection of Greenwood Lake Turnpike and Marshall Hill Road.

Second, although not a new road, Clinton Road has been paved within the past year. It is now much safer and efficient in moving traffic from Warwick Turnpike to Route 23. However, it is only 18 feet wide in places and geometrically, not designed for high speed travel. For the most part, it also traverses public land. For these reasons, it should be investigated for designation as a scenic roadway or similar status. It should also remain as a local roadway.

A similar status should be considered for Burnt Meadow Road. Its unimproved portion terminates in Ringwood and may some day be paved. However, currently it traverses along some state land and private land in a unique setting that has benefits as a scenic resource.

Finally, Paradise Road should be similarly considered because of its view of the reservoir and public land.

The other new road recommended in this plan is the extension of Echo Lake Road through the City of Newark property into the Township owned property at Sunset Lake. This property is recommended for future office-research development and a roadway from Echo Lake Road is essential to its proper development. This road could eventually connect to Otterhole Road via Hightop or through new development.

Lastly, the realignment of Greenwood Lake Road and Beech Road for the construction of the Monksville Reservoir has been added to the Plan.

Improvements

Various improvements to roads and particularly intersections will be necessary as the Township grows. Detailed improvement plans will be proposed in time, but cannot be listed here. Instead, a general description of the area and desired improvements provided:

Greenwood Lake Turnpike - realignment at various locations, particularly Jungle Habitat.

Greenwood Lake Turnpike-Burnt Meadow Road -sight distance improvements and possible realignment

Greenwood Lake Turnpike-Awosting Road - provision for left turn lane onto Awosting Road and alignment.

Greenwood Lake Turnpike - Marshall Hill Road - realignment for better control, Cahill Cross Road connection, possible signalization

Greenwood Lake Turnpike - Warwick Turnpike - general realignment, traffic safety improvements

Marshall Hill Road-Lincoln Avenue - realignment to improve sight distance

Marshall Hill-Union Valley-Ridge - major intersection improvement, road widening, signalization and parking control, i.e. deli and drugstore

Macopin-Union Valley - major realignment and possible signalization

Union Valley-Route 23 - investigate viability of overpass to Route 23 south

Macopin Road-Cahill Cross Road - left turn lane, alignment with new Cahill Cross Road, possible signalization

Macopin-Echo Lake - alignment for connection to extension of Echo Lake Road, possible signalization

Echo Lake Road-Route 23 - investigate viability of overpass to Route 23 south

Warwick Turnpike - complete third lane above White Road

Gould Road - replace one lane bridge

Burnt Meadow Road - replace bridge

Macopin-Maple Road - coordinate with Macopin-Echo Lake improvements

Canistear Road - investigate remedy for one lane tunnel under railroad.

Morsetown Road - new intersection with Cahill Cross Road.

MASS TRANSPORTATION

A review of the 1980 Census indicates that a large majority of the population must travel outside the municipality for employment. The primary mode of transportation is the automobile. However, in certain instances the use of mass transportation facilities is available.

For the commuter population destined for New York City bus transportation is available. Two bus lines have daily routes into New York City; one from Warwick via Greenwood Lake Turnpike and one from Newfoundland via Route 23. The Township has a park and ride facility on Greenwood Lake Turnpike (112 parking spaces) and has an additional park and ride facility on Old Route 23 in Newfoundland (150 parking spaces).

There are also several informal park and ride areas along major arteries. These include Route 23 and Cannistear Road and Route 23 and Echo Lake Road and Greenwood Lake Turnpike and Awosting Road.

Future park and ride facilities must be a function of the Township growth and increase demand for transportation services into New York City. The park and ride facility on Greenwood Lake Turnpike is at times at capacity. Projections of ridership indicate that an expansion of this lot could be feasible within the next few years. The adjacent land (5 acres) is owned by the New Jersey Department of Transportation. The Township has conducted meetings with New Jersey Transit Corporation for expansion of this facility. The expansion should take place through a grant program by New Jersey Transit.

The construction of the new park and ride facility on Old Route 23 should do much to encourage riders to park at that central location. This will be more encouraging as the informal lots are closed or property owners prohibit parking. This facility should be planned to accommodate present as well as future parking needs.

In conjunction with development along Union Valley, an additional park and ride facility is being considered in this area. The form of this facility may be to locate it in the parking area of one of the commercial uses that are being proposed. Housing unit projections indicate that 1,500 units could be constructed in this area. The Township is now discussing this possibility with New Jersey Transit and the Planning Board will be discussing the park and ride potential with each applicant within the Union Valley corridor.

Rail transportation is virtually non-existent within the Township. The only potential for rail transportation exists in the Oak Ridge-Newfoundland are with the Susquehanna Railroad. This line runs from New York State through Sussex County into West Milford through Butler, Oakland, Paterson, Hackensack and eventually, Jersey City. It had been an active passenger line until the early 1960's when service was discontinued. In this area, freight traffic was reinstituted after acquisition of the railroad by Ostewego New York Railroad. Just recently, there has been discussion of attempting to run commuter trains on the line which may be scheduled for mid 1987. The Board encourages the expansion and reinstitution of commuter rail service on this line.

infrastructure

INFRASTRUCTURE PLAN

WATER SUPPLY

In the last few years, with the increasing development pressures on West Milford, a growing concern has been expressed over the future quantity and quality of the potable water supply. Although 99% of West Milford's residents presently utilize groundwater supplies, the proximity of surface water supplies and the possibilities of municipal well fields are important issues that are becoming critical elements of the growth of the Township.

In recent years (1983, 1984), two studies conducted for the Township by Malcolm Pirnie Inc. and Rutgers University, began to identify some characteristics of the water supply. In the review of ground and surface supplies, both groups analyzed the Townships potential supply, identified areas of high yield as well as the location of future municipal systems. In addition, both studies identified the vulnerability of these supplies particularly the groundwater supply. To insure the future supply of this groundwater, concepts as current planning capacity (C.P.C.) and zoning, are regulatory devices that will assist in the growth management of a community of finite and sensitive resources.

Groundwater

Groundwater in West Milford has become an increasing concern, particularly with the expected development pressure within the time frame of this Plan.

At present, 99% of West Milford residents derive their drinking water from groundwater despite the 5 reservoirs and approximately 20 lakes in the Township.

The Townships interest in the quantity and quality of the groundwater began with the initiation of a well study by the Environmental Commission. The Commission recorded the depth and yields of over 1500 wells in order to provide an instrument for future land use decisions and to assist in drawing correlations between the well yields and geologic formations. This information has proved invaluable in the work done by both Malcolm Pirnie and Rutgers University in their studies of the Townships water supply.

Community Systems

The Malcolm Pirnie Engineering Co. was retained by the Township to assess the groundwater yield for community systems, identify areas of potential ground and surface

supplies, and to make long term water supply recommendations. This study utilized the existing well records in addition to the United States Geological Survey (U.S.G.S.) for their determinations.

Regarding the community systems, Malcolm Pirnie found that 84% of the residents utilize individual wells with the balance serviced by some 27 existing systems of various sizes. The community systems listed in Table 7 are only those that have 20 or greater service connections. The 9 systems indicated by an * were previously private systems that have since been taken over by the Municipal Utility Authority (M.U.A.) As additional systems are brought up to Township standards (Birch Hill, Greenbrook, Post Brook), these, too, will be acquired by M.U.A.

The Township is presently reviewing the potential interconnection of systems as part of the development review process. Potential connections would not only provide some insurance relating to the water supply of each development, but also insure fire protection ability as well.

The formation of community systems will be an important consideration, particularly in the Town center as they may provide the necessary infrastructure for future connections to municipal well fields.

The Malcolm Pirnie Report also identified areas of high groundwater by first identifying two types of aquifers in West Milford. The first, is a bedrock type where groundwater occurs in joints, cracks and fissures. The higher yielding aquifer consists of unconsolidated pleistocene (glacial) deposits overlying bedrock and located in the river and stream valleys. Malcolm Pirnie found a documented relationship between the well yield and its topographic location (valleys = high yields; hills, and uplands areas = lower yields) The highest yielding aquifers are listed in Table 8 and were viewed as potential sites of future municipal wells.

Of the areas identified, none have been systematically investigated with the exception of the Charlottsburg area. A thorough study of each of these areas is warranted, particularly in the Pinecliff/Belchers Creek Corridor. Where significant water supplies potentially exist, consideration should be given to the location of a municipal well field.

An independent study conducted by Rutgers University assessed the carrying capacity of the Township based on the quality and quantity of the groundwater supply. In its analysis, of groundwater, Rutgers divided the Township into 165 watershed basins. Through the use of the well records

TABLE 7 : EXISTING WATER SUPPLY SYSTEMS

System	Avg. Production (mgd)	# wells	well capacity (mgd)	storage (mg)
Awosting*	.032	3	.140	.090
Birch Hill*	.014	2	.022	.090
Camelot*	.009	1	.035	.015
Cresent Park*	.055	2	.092	.100
High Crest	.044	-	-	.100
Highview*	.040	2	.099	.200
Greenbrook*	.024(2)	3	.151	(1)
Greenwood Lk Beach*	.022	1	.180	.030
Olde Milford*	.060	3	.120	.280
Parkway*	.005	1	.027	.005
Post Brook	.045	3	.120	.045
Reflection Lakes	.004(2)	(1)	(1)	(1)
Shady Lake	.022	1	.009	.035
Viking	.007(2)	1	.040	.010
Wonder Lake	.014	5	(1)	.001
Bald Eagle	.060	2	.360	.333

Notes:

(1) Data not available

(2) Estimated

* MUA Systems

TABLE 8 : HIGH GROUNDWATER YIELD AREAS

	Pine-cliff	Monks-ville	Upper Green-	West Brook	Charlott-esburg
watershed area (sq.mi)	10.5	3.1	2.5	3.1	12.6
aquifer area (ac.)	2000	100	300	1000	1600
stored (1) water (mg)	10000	300	1100	1500	2400
wells yielding 100,000 or more	11	0	7	4	4
potential(2) yield (mgd)	1.6	0.1	0.2	0.8	1.2

Notes:

(1) Assuming 25 percent porosity and recovery of 75 percent of the water in overburden deposits.

(2) At 500,000 gallons per day per square mile.

and the existing geological information, in addition to field inspections, an estimated yield was determined in each basin. A population threshold was assigned to each basin the estimated quantity and the existing quality of the water supply.

A third report, titled the Emergency Groundwater Investigation was conducted by the Department of Environmental Protection during the drought crisis of 1980-1981. This study was done to assess the groundwater yields and determine potential areas of high yielding wells to augment the upper Rockaway River and Pequannock watersheds in periods of drought. Actual test wells and borings in addition to geophysical field studies were done. Although only one test well was examined in West Milford, the report identifies a possible underground river with significant yields in the area from Kanouse to Clinton Brook and west of Route 23.

Although there appears to be extensive research of West Milford's groundwater supply, little specific research has been done. The problem of quantifying the available yield still exists. A study of the quantity of groundwater or the sustained yield of the areas of greatest development pressures would afford some insurance to residents. This data will also provide an additional instrument to be used in the refinement of the zoning requirements. Further studies should include a geophysical study of the identified high yield areas, a cost/benefit ratio of a municipal reservoir, verses municipal well, or a hook-up to an existing purveyor.

Individual Systems

Most of the information related to groundwater in the Township thus far has dealt with community or municipal systems. An important aspect yet to be addressed are the individual wells. Presently some 84% of the Township is serviced by individual wells. These vary significantly throughout the Township both in yield and depths dependent upon geological formation of an area. These wells were once perceived as a limitless free resource by the homeowner. This perception has been quickly changed in areas when a well runs dry or contamination occurs. It is believed that most residents of the community do not realize that water is an important and finite resource and that conservation is necessary. As was identified by the Rutgers report some areas of the Township particularly in the lake districts, that the quantity and quality is threatened. However, other areas of the Township have also exhibited contamination, from septic, oil or gas tanks, as well as water shortages.

Simple techniques as outlined below can assist in protecting and preserving the individual wells in addition to providing an economic incentive to the homeowner. They include;

1. The use of water conservation devices such as flow restrictions for faucets and showers and 1.5 gallon toilets can greatly reduce the impact on water supply.

2. The reduction of water consumption in a home reduces the strain put on a septic field. A large volume of water can reduce the effectiveness of the field and may require the septic tank to be cleaned more often. A reduction in water will not negatively impair or reduce the effectiveness of septic system.

3. An individual well requires power to operate a pump. Reductions in the use of water results in energy savings as well as reducing the strain on the pump mechanism.

From the research available to the Township thus far, a few characteristics of its groundwater supply can be summarized:

1. Groundwater is available almost everywhere in the Township. However, the quantity and occurrence varies considerably with the geologic material underlying the various parts of the Township.

2. Most groundwater in a basin originated in the basin as precipitation, thus demonstrating the potential for a limited supply in years of drought.

3. There are no known regional aquifers located in the area from Route 23 and Northeastward; however, a possible underground river may exist in the area from Kanouse/Clinton Brook.

4. Groundwater in West Milford is a replenishable resource as long as withdrawal does not exceed the recharge capacity of the basin.

Recommendations for groundwater supplies include:

1. Further geophysical studies of the potential high yield areas, as well as the more intensity developable sections of the Township as proposed in the land use element.

2. Investigation of the impact of small lot individual well development on groundwater quality vis a vie the Rutgers Study.

3. Further investigation into the potential for a municipal well field within the Town Center area.

4. Continued effort to interconnect community water systems under the jurisdiction of the Municipal Utilities Authority.

5. Review of the existing infrastructure of the water supply and distribution system and to outline a long term program for replacement.

6. Soil test borings should be done as part of the application development process to assess groundwater supply capabilities.

Surface Water

As indicated earlier, West Milford predominately utilizes groundwater for its potable supply. However, due to the proximity of major surface supplies, specifically the City of Newark's supply and the North Jersey District Water Supply Commission (N.J.D.W.S.C.), the issue of surface water availability and the cost effectiveness of delivering the supply from these sources is timely. Although these issues cannot be resolved at present, a review of these systems will assist in the understanding of some of the factors that may govern them.

Presently, there exists 3 major water purveyors in or within close proximity to West Milford; City of Newark, Borough of Butler, and the North Jersey District Water Supply Commission (N.J.D.W.S.C.). with the City of Newark and the N.J.D.W.S.C. retaining the diversion rights for most of the runoff in the Township. Of these three, it appears that only Butler and the N.J.D.W.S.C. are feasible as potential suppliers, as outlined below.

The City of Newark storage capabilities based on its Pequannock Reservoir System totals 14.36 billion gallons of storage among its 5 reservoirs (Canistear, Clinton, Oak Ridge, Charlotteburg and Echo Lake). The safe yield from this supply is between 50-55 mg/d. However, Newark's demand on its supply often exceeds the available yield and so they are not considered a likely source for West Milford at least not directly.

The Butler Water Co. already supplies High Crest Lake through a private water purveyor. Research done by Malcolm Pirnie indicates that an additional 2-3 mg/d of water may be available to West Milford. This translates into a supply that could support an additional 20,000 people in this area. This supply may not only prove important for residential use but may also be a consideration in the development of the Apshawa tract by the county. Further research should be given to connection to this supply when development occurs in this area.

The N.J.D.W.S.C. was established in 1916 by State legislature. Governed by a 5 member commission, it is mandated to develop water supply facilities for northern New Jersey. The commission, who administers and operates the the Wanaque Reservoir is made up of the following municipalities, and includes their percentage of ownership:

Newark	40.50%
Paterson, Clifton, Passaic (Passaic Valley Water Commission)	37.75%
Kearny	12.00%
Montclair	5.00%
Bloomfield	4.00%
Glen Ridge	.75%

Located in Ringwood in the Wanaque River watershed, the present reservoir has a total storage capability of 29.5 billion. However, with the completion of the Wanaque South Project or Monksville Reservoir, located in both West Milford and Ringwood, an additional storage capacity of 7 billion gallons will be added. This combination of reservoirs will have estimated safe yield totaling 119 mg/d.

In an earlier report, the Passaic Valley Water Commission indicated a willingness to supply water to West Milford. However, the pipeline needed to deliver water, from the outflow in Wanaque did not prove feasible. With the completion of the Monksville Reservoir in 1987-88, the access to this supply for West Milford may become feasible. at some future date. Since the P.V.W.C. has expressed an interest to purvey water to West Milford and presently services parts of Ringwood, a dialog with N.J.D.W.S.C., concerning this issue should be initiated.

In addition, Malcolm Pirnie (as part of their report identified areas for potential reservoir sites in West Milford. The preliminary criteria for a surface supply site included a suitable dam site, a maximum depth of 40' or more and a largely undeveloped watershed of 1 mile or more. Malcolm Pirnie identified sites based on that criteria which are identified in Table 9.

TABLE 9 : POTENTIAL RESERVOIR SITES

	JC(1)	BB(2)	WB(3)	DP(4)	MB(5)	Monk(6)
watershed area(sm)	2.7	1.3	4.9	2.6	1.5	42.0
reservoir area (ac.)	71	47	25	127	64	500
reservoir avg. depth(ft)	20	20	15	25	10	-
reservoir storage(mg)	463	306	123	1032	209	6,900
available yield (mgd)	1.2	0.6	2.2	0.7	0.4	6.0

Notes:

(1) Jennings Creek
(2) Beech Brook
(3) West Brook
(4) Dunkers Pond
(5) Mossmans Brook
(6) Monksville

In the selection of the reservoir sites, geotechnical, environmental and economic feasibility were not considered. With the exception of West Brook, most of the other potential watersheds are already publicly owned with the rights held by either N.J.D.W.S.C. or the City of Newark. Based on this data, the future of a municipal surface water supply appears dependent upon N.J.D.W.C.S and Butler.

From the studies conducted for the Township and the research done by the Department and Committees, the following recommendations can be made:

1. A tie into the Butler Water Co. should be considered with any development of the southwest portion of the Township.

2. The feasibility and cost effectiveness of the North Jersey Water Supply Commission supplying West Milford with water upon completion of the Monksville Reservoir should be researched. Similar possibilities should be discussed with the Passaic Valley Water Commission.

3. The cost of development of the West Brook Reservoir site should be compared to the cost of receiving services from the P.V.W.C. and N.J.W.S.C.

WASTEWATER MANAGEMENT PLAN

West Milford Township consists of 78 square miles of land area in which 23,000 people reside as of mid 1984. Over 50% of the land is in public ownership. The State of New Jersey, the City of Newark, and the County of Passaic account for the majority of this public ownership. There are smaller amounts of acreage owned by other public entities for recreational purposes as well as Township owned land.

The balance of West Milford is rough and rugged land. Flood plains, wetlands, and rock outcroppings exist throughout. There is, however, land which is developable and which will be the subject of future development.

Approximately 90% of the Township's development is served by individual septic disposal systems. Operation and maintenance is conducted by the private homeowner. There are several sewerage facilities which have been constructed in conjunction with major development projects. The majority of these plants are owned and operated by the West Milford Municipal Utilities Authority. This autonomous organization was established for the express purpose of operation and maintenance of these facilities. Finally, there are several small or seasonal plants which are owned privately and still operate on that basis. All of these are for commercial or recreational land uses under one ownership.

Existing Systems

The existing sewerage treatment plants were analyzed by Malcolm Pirnie engineers in 1984 in a study conducted for the Township Planning Board. Since this study two additional developments Bald Eagle Village and Williamsburg and their respective plants have also received Township approvals. Table I lists the existing plants and their characteristics. Of these facilities, Highview, Crescent Park, Olde Milford, Birch Hill, and Awosting are under the ownership of the MUA.

Expansion Capabilities

Malcolm Pirnie reviewed the potential of each facility to assess their expansion possibilities. Four factors are considered in the assessment: process suitability, site suitability, land use compatibility, and effluent disposal.

Process suitability refers to how adaptable the existing treatment processes are to increased flows, addition of parallel units and unattended operation. Septic tanks and sand filters are not preferable for large flows or

several parallel units. The contact stabilization process requires more attention to sludge management than extended aeration. Therefore, it is rated lower. The Awosting plant was downrated from good to fair because of severe infiltration/inflow problems in the sewer system.

Site suitability refers to the availability of land at an existing plant to double its capacity. Plants with sufficient vacant land are rated good. Plants with sufficient land occupied by processes which could be made more compact (generally sand filters which could be replaced by high rate filters) are rated fair. Plants without sufficient land are rated poor.

Adjacent land use refers to compatibility of wastewater treatment with the neighboring land uses. Plants with no neighbors within 500 feet except commercial or industrial uses are rated good. Plants with no neighbors within 200 feet except commercial or industrial land uses are rated fair. Otherwise plants are rated poor.

Effluent disposal may be by surface discharge or land application. Plants discharging into streams without downstream impoundments are rated good for surface discharge. Eutrophic impoundments are rated poor for surface discharge and High Quality-Category One waters are rated very poor for surface discharge. Rating for land application are based on the relative magnitudes of the nearest disposal site's capacity divided by the distance in feet. This provides some measure of the advantages of both proximity and capacity. The three highest ranking sites are rated good, the next four are rated fair, and the lowest four are rated poor.

The expansion possibilities for the existing treatment plants are not encouraging. None of the existing treatment plants are suitable for expansion followed by surface discharge. However, Milford Manor, Highview, and Eagle's Nest appear suitable for expansion followed by land application of wastewater. Of course, these evaluations must be confirmed by detailed site investigations before an expansion could be designed. The approximate capacities of the expanded facilities are as follows:

System	Population Served	
	Existing	Potential
Milford Manor	100	1000
Highview	370	1000
Eagle's Nest	Seasonal	2000

Existing Service Area

West Milford lies within two major watershed boundaries; the Pequannock and the Wanaque. The Northeast New Jersey Water Quality Management Study delineates the Township into these two service areas. There are no major wastewater treatment plants within West Milford. In the Pequannock basin projected interceptors have been excluded from the plan and will not be extended into the Township.

In the Wanaque basin, West Milford has been included within the Wanaque Regional Facility. Plans to construct an interceptor line into the Belcher's Creek area of the municipality were developed. That line was designed to service the Crescent Park, Olde Milford, Highview, and Awosting sewer plants. It would also provide facilities to additional service areas including Greenwood Lake, Kitchell Lake, Lindy's Lake, Pinecliff Lake and Upper Greenwood Lake.

The Management Study still calls for this interceptor to be implemented. However, questions of economic feasibility and sewerage treatment philosophy and policy changes have made construction of this line doubtful. Other questions raised concern the diversion of potential recharge water out of the basins and the affect this will have on groundwater and lake levels.

Individual Septic Systems

As indicated in the introduction, approximately 90% of West Milford utilizes individual septic systems. Once a predominately vacation community, the seasonal development primarily occurred around the lakes on small lots, with individual systems. Most of the other older development in the Township occurred along the main arteries into the township and on larger lots.

Due to the type of terrain and constraints of the Township, such as steep slopes, high water table, wetlands, and the unwieldy size of the Township, the possibility of locating a central treatment plant to service the Township areas is remote.

More recently, studies conducted by Malcolm Pirnie (1983) and Rutgers University (1984) both confirmed the restrictive nature of the land and recommended large lot sizes for most of the Township where a central sewer and water system was not provided.

Zoning

The Township is cognizant of the fact that in order for proper development of West Milford to occur, the environmental limitations of the land must be respected.

As a result, the Township's residential zoning is predominately large lot zoning (1-4 acres) for areas with environmental constraints, and away from Township services. Provisions for development such as clustering, townhouses, and smaller lots are located nearer to Township services and in the less constrained areas only if a central sewer and water system is available or provided. These areas are the areas where new and future development is likely to occur within the town. It is here also that a possible linking of treatment plants will occur when the Township experiences enough development to make it cost effective.

Based on the fact that more than 50% of the land in West Milford is either owned by the State of New Jersey as parkland or the City of Newark as watershed property, much of the land will remain as open space. Bearing in mind the environmental limitations and the recent studies conducted for the Township, the current and future development of individual lots in the Township will primarily be large lot development with individual septics and wells in areas away from the Township center.

The Plan

Considering the above circumstances, the Township has attempted to plan for future wastewater facilities on a comprehensive basis. Several factors are considered;

1.) the prospect of the Wanaque Valley interceptor construction in the very near future is not feasible

2.) growth demand upon the Township will be significant within the next decade

3.) the Township has established its zoning plan based upon a Comprehensive Master Plan and through several statewide legal and planning parameters which have necessitated cluster and multi-family development.

4.) this type of development requires that wastewater facilities be constructed in conjunction with such development

5.) the West Milford MUA was established to regulate the construction and planning of such facilities and to own and operate such facilities

Considering the above factors the following criteria will be established and recommended for the Wastewater Plan.

1.) Several smaller wastewater plants will be constructed to accommodate continued development in the R-1/PN zone and cluster development

2.) That the minimum acreage of such projects will constitute 50 acres. This will permit certain economies of scale and efficiencies of plant construction.

3.) Plants will be constructed in accordance with the criteria utilized in the Bald Eagle development i.e. biological treatment, nitrate removal, subsurface or land disposal as a minimum.

4.) The MUA will own and operate these facilities and homeowners utilizing these facilities will become MUA customers.

5.) Wherever possible, plants will be constructed so that they may be interconnected to eventually form one service system or a series of smaller service systems.

6.) Systems will attempt to provide service or the ability for service for densely populated previously developed communities i.e. lake communities.

7.) Design will include provisions to connect to the Wanaque Valley interceptor if and when it becomes available.

8.) Smaller, inefficient, poorly located proposed plants will be discouraged.

9.) The Municipal Utilities Authority or the Township will be the permittee or co-permittee to the N.J. DEP for sewerage construction and discharge permits.

10.) The critical areas of the Township (wetlands, floodplains, steep slopes) will not be encouraged for development associated with sewerage service discharge development .

community services

Service Area Descriptions

The map indicates the location of existing wastewater treatment facilities and the location of the proposed facilities in conjunction with future potential development.

The USGS maps enclosed indicate the proposed wastewater service areas within the Township. Nine (9) service areas are proposed pursuant to the above criteria. A description and analysis of each service area is discussed below.

1. Belchers Creek Service Area - This service area includes approximately 92 acres. The area includes the existing Shop Rite Plaza, the Wiggins Farm site, Adelaide Terrace area, the Town Hall and commercially zoned property along Union Valley Road.

The service area is zoned for commercial purposes and could develop to 250,000 to 500,000 sq. ft. of commercial space. This zone may also permit senior citizen housing which would be integrated to the commercial. Estimated flow for this service area would be approximately 200,000 gallons per day. There is a wetland and floodplain area noted on the map along Belchers Creek that will limit the amount of development.

The existing plant in this service area has an average flow of 0.007 MGD and a capacity of 0.0020 MGD. An additional plant may be constructed within this area. The Municipal Utilities Authority has the opportunity to obtain ownership of the existing STP.

2. Marshall Hill Service Area - This service area is approximately 103 acres in size and consists of two major parcels; the Birch Hill development (fully developed) and the Marshall Hill School (public property). No further major development is expected within the service area except for a small shopping area of 40-50,000 sq. ft. within this district and the completion of the Birch Hill community. The existing treatment plant has the capacity for 24,000 gallons per day. There is a small floodplain traversing the area. Some thought to subsurface discharge should be considered for the future in this area for the existing plant.

3.) Greenwood Lake Service Area - This service area is located along Greenwood Lake Tpke. and Airport Road. Total acreage includes the Jungle Habitat site, 1000 + acres and the West Milford Airport Property, 217 acres. This area could be zoned for office, commercial, industrial and residential purposes. This area is in the process of being rezoned through Master Plan revisions. At this time it is not possible to determine the precise magnitude of potential development or the development mix of uses. One scenario could produce 1.5 million sq. ft. of commercial space and 1,000 dwelling units. The existing treatment facility in the service area will be disengaged and a new facility will be required. A small wetland and floodplain area exists directly along Greenwood Lake Tpke. which will not be disturbed as part of the development. The ultimate method of discharge will be through subsurface disposal.

4.) Awosting Service Area - This service area is located between Greenwood Lake and Awosting Road and includes 105 acres. It is essentially developed and has an existing treatment plant with 22,000 gallons per day average flow and 45,000 gallons per day capacity. A small wetland and floodplain are located at the north end of the service area which is the outlet of Greenwood Lake and consists of State-owned property. No expansion of this STP or capacity is planned.

5.) Hines Farm Service Area - This area consists of 300 acres of land located along Union Valley Road south of Pinecliff Lake. It is zoned for multi-family development and 400-500 units are possible here. There is an extensive wetland and floodplain (Belcher's Creek) running through the center of the service area. These environmentally sensitive areas will not be disturbed in conjunction with this development. The proposed sewerage treatment facility will have a capacity for approximately 130,000 gallons per day. This STP will incorporate the Reflection Lakes treatment facility of 2,000 gal./day which would be phased out of service.

6.) Bald Eagle Service Area - This service area includes the Bald Eagle multi-family development (440 units) and its existing sewer plant (80,000 gallons per day capacity) on 100 acres of land. This approved facility may be capable of accommodating additional development of smaller sites which

are south of the development and if possible, would make the size of the service area 194 acres. This small addition to the Bald Eagle service area could also potentially be tied into the Union Valley Service Area discussed below. The Bald Eagle service area is just south of the Hines Farm area on the west side of Union Valley Rd.

7.) Union Valley Service Area - This service area is located on the east side of Union Valley Rd. adjacent to the Bald Eagle service area. It also includes the Crescent Park treatment facility and development and the small area adjacent to the Bald Eagle Service Area on the west side of Union Valley Rd. Total acreage of the area includes 325 acres of which 131 acres are developed. The balance is vacant and zoned for multi-family residential and a small amount of commercial. Projected dwelling units are 800 with approximately 200,000 sq. ft. of commercial space. The new treatment plant for the entire service area will be approximately 300,000 gallons per day. There are several small wetland areas and a floodplain located within this area which will not be disturbed in the development process.

The Crescent Park STP will be modified to permit treatment in the new plant. The existing plant has an average flow of 0.052 MGD with a capacity of 0.064 MGD. The new STP will incorporate subsurface disposal as final discharge.

8.) Olde Milford Service Area - This service area is located along Macopin Rd. and includes the Camelot and Olde Milford subdivisions totaling 328 acres. The Olde Milford subdivision has approximately 200 homes developed with 70 homes anticipated. Camelot has 47 homes constructed with 60 additional homes expected. The existing treatment plant was designed for these developments and has 170,000 gallons per day capacity. There are several small wetland areas on the Olde Milford site and one significant wetland on the Camelot site. The wetlands on Olde Milford are within extension areas of the development and therefore can be protected. The Camelot wetland will effect the type and nature of development that will occur as will the floodplain running through the general area of Camelot.

There is no planned expansion of the STP or service area with the exception of possibly Pinecrest Lake (see below). The plant may be modified however, to convert the present stream discharge to subsurface discharge.

9.) Highview Service Area - This service area (256 acres) is located along Macopin Rd. south of Westbrook Rd. It includes the Highview subdivision (west) and the Board of Education complex (east). The subdivision contains homes with only limited prospects of being expanded. The existing plant has a capacity of 80,000 gallons per day and is operating at 56,000 gal./day.

However, a significant land area east of the Board of Education complex; 151 acres (Diani Farm), has been added to this service area. At this time, it is not possible to determine whether the development of this tract will be annexed to the existing STP or an additional STP will be constructed. If additional facilities are required, subsurface discharge will be employed. If the existing plant can be expanded, them subsurface discharge methods should be strongly considered in place of the current stream discharge.

10.) Macopin Ridge Service Area - This service area consists of 114 acres located between Macopin and Ridge Rds. just south of the Town Center. It is located on both the Wanaque and Newfoundland Quadrangles. The land is zoned for multi-family development. However, a significant portion of the site is considered wetland. This will severely constrain development potential of the site. The total proposed capacity of the STP will be approximately 150,000 gal./day. The method of final disposal will be through subsurface discharge.

11.) Morsetown-Ridge Service Area - This service area lies between Morsetown Rd. and Ridge Rd. south of West Milford Lake. The total land area of this district is 174 acres. The service area is zoned for single family and multi-family development. It consists of the Williamsburg multi-family project, a vacant 75 acre parcel adjacent to Williamsburg zoned for multi-family development and the existing West Milford Lake community (184 dwelling units). The capacity of the Williamsburg treatment facility is 75,000 gallons per day. There may be a second treatment facility within this basin which will include an additional 80,000 gallons per day.

12.) Prospect Ridge Service Area - The Prospect Ridge Service Area includes the Prospect Ridge condominium development (61 dwelling units) and the Joseph condominium (15 dwelling units). These are two separate and distinct

projects whose borders are not contiguous. Each will require a separate treatment facility. Proposed treatment will be tertiary with subsurface disposal. An attempt should be made to combine these two systems if possible.

13.) Sunset Lake Service Area - This service area includes two major tracts of land; a residential tract on Otterhole Rd. of 396 acres and an office-research tract of 140 acres on Macopin Rd. It also includes two fully developed lake communities; Gordon Lake and Shady Lake with approximately 246 dwelling units. There are no development proposals in this service area however, development is expected in the future.

It is premature at this time to determine the exact capacity of the STP or STPs. It could range from 0.10 MGD to 0.80 MGD. The components will be consistent with Township and NJDEP regulations and will include subsurface disposal as final discharge. Up to two individual treatment plants may be required in the service area.

14.) Idylease Service Area - Along Union Valley Rd. near Rte. 23 is the proposed Idylease Service Area. This tract is 112 acres in size and is located on both sides of Union Valley Rd. There is a possibility of permitting institutional and residential uses on this tract. Total average daily flow and capacity from any STP is premature at this time. STP construction and method of disposal will be consistent with other new service areas, i.e. subsurface disposal.

Lake Communities

Another aspect of this plan is to consider the possibility of constructing sewerage collection systems and treatment facilities within the lake communities of West Milford. A study conducted for the Township by Rutgers University concluded that the groundwater in these areas may be threatened due to pollution from septic disposal.

These communities are densely developed on small lots. They rely exclusively on individual wells and septics for water and disposal respectively with one exception, Highcrest Lake, which has an external source of drinking water.

The policy established by the Township is to encourage sewerage treatment plants to be constructed separately or in conjunction with adjacent development in these communities. A review of the lake service areas shows that in many cases, adjacent large scale development could be designed in such a manner so that additional capacity built into the plant by some agreement with the developer could absorb a portion or all of the adjacent lake community.

The lake communities in this plan include:

15.) Pinecliff Lake Service Area - This area includes approximately 405 homes and 1100 population. The approximate flowage is 0.010 MGD. This service area could be merged with the Bearfort Service Area or the Hines Farm Service Area.

16.) Lindy-Mt. Glen Service Area - This area consists of the communities of Lindy Lake, Upper and Lower Mt. Glen Lakes and Postbrook. It has approximately 544 dwelling units and 1500 population. This service district is adjacent to the Highview and Sunset Lake service areas. The estimated sewerage flow from this service area is 0.15 MGD.

17.) Pinecrest Lake Service Area - This service area includes a smaller lake community and several vacant tracts of land adjacent to the lake. This area is zoned for higher density development and can be expected to have one or two sewerage treatment plants. The size of these plants are rather small in size, being 0.003 MGD generally. One alternate plan may be to attempt to merge this service area to the Olde Milford Service Area which is within the adjoining drainage basin. The second alternative would attempt to interconnect with the Union Valley Service Area which is across the ridge from this area. Neither of the two alternative service area options have contiguous land with the Pinecrest Service Area.

18.) Upper Greenwood Lake Service Area - By far the largest lake community in area and population is Upper Greenwood Lake. The service area would include the neighborhoods of Upper Greenwood Lake, Mt. Laurel Lake, Shadyside, and Warwick Tpke. The population of this area is approximately 3,000. The estimated sewerage flow within this service area would be approximately 0.30 MGD.

Upper Greenwood Lake would be one of the most difficult areas in which to implement a sewerage collection and treatment system. The community is separated from other service areas by distance and topography. Interconnections

to other systems do not appear likely because of this and because of the size of the community that would be required to be absorbed.

Similarly, constructing its own system will be difficult. The capital investment needed to construct the system will be substantial. The engineering difficulties in constructing the system are considerable due to varying topography, depth to bedrock and suitable disposal areas. At this time, there is no large scale development proposed in this area which could be utilized as a catalyst for construction of the system.

Given these constraints, however, it is never the less important to designate Upper Greenwood Lake as a wastewater management service area. The potential for deterioration of environmental and health conditions could prove to be the stimulant for public action in this regard. To exclude this area from consideration would not be appropriate. This is perhaps the service area with the highest priority for public action through the MUA's planning and through the use of federal and state funding programs.

19.) Highcrest Lake Service Area - This area includes Highcrest Lake, a community of 600 people, the Apshawa Reservoir tract of 500 acres, the neighborhoods of Trails End and Wonder Lake (400 population), Mountain Springs Lake (100 population) and a vacant parcel of land adjacent to Highcrest Lake of 93 acres. The estimated sewerage flow from this area is approximately 0.11 MGD.

Highcrest Lake is serviced by the Butler Water Co., therefore it does not rely upon groundwater for its water supply. However, individual septic fields have endangered groundwater supplies for those areas outside the community.

Commercial Areas

Two other service areas have been established based on their capacity for smaller scale commercial and industrial development. There are no impending plans to construct central treatment facilities within these districts. That may change depending on the nature and scope of the actual development and the degree of public funding available. Some of the developed areas will, however, exceed the 2000 gal./day threshold established by the NJDEP which will require discharge permits. It is assumed that treatment systems will consist of individual conventional septic systems. NJPDES permits will be required from developments meeting the above threshold.

The two service areas where this criteria would apply include:

20.) Belchers Creek Service Area - This area runs along Greenwood Lake Tpke. and Union Valley Rd. from Marshall Hill Rd. to White Rd. It includes all the commercially zoned property along this road as well as existing residential areas along Lincoln Ave., Greenwood Lake Tpke. and Greenbrook Estates. It is adjacent to Prospect Ridge Service Area and the potential may exist at some future date to interface these systems. The expected total flows within the service area cannot be accurately calculated at this time although 1.0 MGD appears possible.

21.) Oak Ridge Service Area - This service area consists of the area along Oak Ridge Rd. from Rte. 23 to Bonter Rd. The area expands north to Paradise Rd. and south to the Pequannock River. This area is zoned for both commercial and industrial uses. Only non-conforming residential uses are absorbed into the service area boundaries. No major treatment facility is anticipated at this time. Development will be through individual conventional on site septic systems unless a substantial project develops or public funding becomes available. The expected total flows within the service area cannot be accurately calculated at this time although 1.5 MGD appears possible.

Recharge Areas

Each service area whether it has an existing STP or a newly proposed STP or vacant land, has been designated as an area where subsurface disposal is recommended as a final disposal method. The primary objective of this disposal method is to recharge groundwater supplies and to use the soils as a final safeguard in terms of treatment.

It is therefore necessary to locate land disposal areas that are properly sized in suitable recharge areas in order to achieve the objective. In several of the service areas, particularly the existing lake communities, it may be extremely difficult to locate proper disposal areas. Therefore, it may be necessary to locate disposal areas outside of the immediate designated service areas. It is not the intention of this plan to expand service areas by locating final disposal beds in this manner. It is the intention to locate disposal areas in the most suitable soils areas that can contribute most significantly to groundwater recharge.

Sludge Management

A Sludge Management Plan was developed in 1983 for the Pequannock and Wanaque basins by PQA Engineering. Sludge from the Wanaque basin would be processed in the Wanaque plant. Sludge would come from the Awosting, Crescent Park, Olde Milford and Highview plants. In addition, septage waste disposal will account for 94% of the total dry solids generated by West Milford in the year 2005. The total solids loading will be approximately 7,030 pounds per day to the WVRSA.

Within the Pequannock River Basin Regional Sewerage Authority in West Milford, there are no sewer plants. Total septage loadings will be derived from individual septic systems. That loading to the PRBRSA will constitute approximately 500 pounds per day by the year 2005.

It is anticipated that any additional plants and individual systems septage will be processed by the treatment facility within the appropriate basin.

COMMUNITY SERVICES

The community services plan seeks to relate the other Master Plan Elements, particularly the Land Use and Housing Elements, to supporting services required as a result of population and economic growth. Both present and future needs of emergency, public safety and other Township services are assessed. As the Township continues to prosper, the need for additional and more permanent services are created.

The following discussion is not a technical analysis of these services, but a general discussion that will stimulate the need for further study.

RECREATION

Recreational needs are vital to a growing and healthy community. In a municipality of 78 square miles in which over 50% of the land area is owned publicly, there is significant open space, but little in the way of formal recreational facilities compared to this open space. The demand for these facilities are ever growing to the point where West Milford uses park areas from the County, the Presbyterian Church and the Board of Education.

There are certain planning criteria that represent the type of recreational facilities a town, city, municipality, etc. should provide. The population of the town and the available acreage are the determining factors in deciding what type and how many of the different recreational areas will be provided.

A playground or playlot is an area designed for preschool children. It is conceived to be the equivalent of residential "backyards" or the open space surrounding homes. A playground is approximately 1,500 to 2,000 square feet in size and should be in clear view of the dwellings within that area.

Neighborhood parks are built to accommodate the recreational needs of children aged 6 thru 14. This type of park is the center of recreation activities for the neighborhood. The neighborhood park should be located within a 1/4 mile walking distance of the neighborhood and include an area for playing apparatus and an open space area for informal play. West Milford does not have any playlots or neighborhood parks as defined previously.

Playfields are designed with young people and adults in mind. One playfield can accommodate four or five neighborhoods. The walking distance to a playfield should

not exceed one mile, one-half mile radius being preferred. A playfield essentially has the same facilities as the neighborhood park with additional facilities for competitive-type sports (ie baseball, football, soccer, etc.), as well as night lighting.

However, West Milford presently has nine playfields. These facilities are leased and maintained by the Department of Parks and Recreation. These eight facilities are:

A. Ernie Oakes Park (Sand Cap): this facility is located behind the Queen of Peace church off of Elm Street. This facility contains four softball fields for the spring and summer and one soccer field for the fall.

B. Presbyterian Field: this facility is located behind the West Milford Presbyterian Church on Union Valley Road. This is one of the two fields that has night lighting. This field is utilized for football in the fall and baseball in the spring and summer.

C. Board of Education: these facilities are located near six of West Milford's schools. These schools are Westbrook, Upper Greenwood Lake, Paradise Knoll, Apshawa, W.M. High, and Marshall Hill. Marshall Hill is the only other lighted field in the Township. These fields are used for baseball, football and soccer.

D. Echo Lake Field: this facility is located across from St. Joseph's Church on Germantown Rd. It is owned by the City of Newark and leased to the Township. It consists of one ballfield, however, the Township and the City are proposing to upgrade this facility to increase its utilization.

The nine playfields essentially follow the definition of a playfield, with the exception of the location to the surrounding neighborhoods. Due to the expansiveness of the township it is diffucult to place recreational facilities within walking distances of nearby neighborhoods.

The community park contains the main facilities for city wide recreation, organized sports, public golf courses, open air entertainment and zoological and botanical gardens. The community park should retain or reintroduce the natural surrounding, and in doing so, maintain the wildlife as much as possible. The area of this type of park varies in size, but is usually considerably large. West Milford currently has four community parks. The following is a list of existing parks and the facilities each of them contains.

A. Bubbling Springs: this park is located on Macopin Road between Wooley and Westbrook Roads. Bubbling Springs has provisions for swimming, fishing, ice skating, and picnicing. Also, there is a playground and two baseball fields.

B. Brown's Point: this park is located off of Greenwood Lake Turnpike across the street from the old bowling alley. This facility accommodates picnicing, fishing and horseshoes. There is a playground and access for boats coming off the lake.

C. Farrell Field: this park is located off of Marhill Road, just a short distance from the township department of public works and engineering. This area has four soccer fields and one football field.

D. Mount Laurel: this park is located on Warwick Turnpike between Tyler and Melrose Place. This park contains a ball field, tennis/basketball courts, a soccer field, playground and picnic area.

West Milford contains another recreational facility that does not fall within the criteria of one of the four recreational facility types. The Hillcrest Community Center, formerly the Hillcrest Elementary School is the home of the West Milford Department of Parks and Recreation. This building also accommodates gym activities, meeting rooms, a senior citizen wing and a baseball/soccer field.

The criteria regarding the types of recreational facilities that should be within a certain town is dependent upon the population and amount of available land. Many of the locational criteria cannot be met in West Milford primarily because it is a car dependent community. There are many recreational facilities throughout the town, but it usually requires vehicular transportation to reach them.

The Department of Parks and Recreation recommends the following facilities to be considered in the future:

A. Lighted athletic fields
B. Bike trails
C. Boat marina
D. Cross country skiing
E. 18 hole golf course
F. Jogging paths
G. Hiking and nature trails
H. Shuffleboard courts
I. Indoor swimming
J. Volleyball courts

At the present those facilities that are utilized are being done so above and beyond their normal capacity. As the town continues to grow the demand for recreational facilities, especially ball fields and tennis courts, will increase as well.

There is also a need for facilities within the Germantown and Newfoundland areas. Most of the present facilities are located near the Town Center. The Township should investigate the possibility of leasing or acquiring land from the City of Newark on Echo Lake Road and in the Newfoundland area so as to be able to service the smaller neighborhoods and decentralized areas of the Township.

EDUCATIONAL FACILITIES

There are presently six elementary schools, one junior high school and one senior high school comprising West Milford's public school system. They are as follows:

Elementary
1. Marshall Hill
2. Maple Road
3. Paradise Knoll
4. Westbrook
5. Apshawa
6. Upper Greenwood Lake

Junior High
1. Macopin

High School
1. West Milford Township

Hillcrest, formerly an elementary school, is currently being rented to the township at $1.00 per annum for community use. Contained in this facility is the township recreation department, services for senior citizens, upcounty service agencies location and health services.

Enrollment

Enrollment statistics indicate current trends in school population caused by changing demographics. The following statistics were taken from the Educational Master Plan.

PAST ENROLLMENT

	79-80	80-81	81-82	82-83	83-84	84-85
K	362	312	325	337	304	355
1	386	379	343	360	337	377
2	379	353	341	315	343	319
3	393	376	349	334	318	343
4	450	389	370	346	330	311
5	413	436	388	366	356	337
6	389	414	426	402	368	362
7	437	377	426	428	418	387
8	397	441	382	419	429	416
9	473	396	431	379	409	425
10	434	470	404	438	380	398
11	427	427	443	396	427	376
12	347	403	402	425	378	405
SE	55	53	52	57	66	69
	5342	5226	5082	5002	4863	4840

The above table on past enrollment reflects the student population of all eight schools from the 1978 to the 1985 school years.

PROJECTED ENROLLMENT

	85-86	86-87	87-88	88-89	89-90	90-91
K	375	437	405	412	418	418
1	383	405	472	437	445	462
2	313	356	377	440	406	414
3	319	313	356	377	440	406
4	340	316	310	352	373	436
5	311	340	316	310	352	373
6	344	317	347	322	316	359
7	369	351	323	354	328	322
8	387	369	351	323	354	328
9	416	387	369	351	323	354
10	425	416	387	369	351	323
11	386	412	403	375	358	340
12	357	367	391	383	356	340
SE	72	76	79	83	88	92
	4797	4862	4886	4888	4908	4967

PROJECTED ENROLLMENT

	91-92	92-93	93-94	94-95	95-96
K	418	418	418	418	418
1	451	451	451	451	451
2	430	419	419	419	419
3	414	430	419	419	419
4	402	410	426	415	415
5	436	402	410	426	415
6	380	445	410	418	435
7	366	388	454	418	426
8	322	366	388	454	418
9	328	322	366	388	454
10	354	328	322	366	388
11	313	343	318	312	355
12	323	297	326	302	296
SE	96	101	106	112	117
	5033	5120	5233	5318	5426

To obtain the projected enrollment the cohort survival methodology was utilized. This method computes a ratio of those students who progress from one grade year to the next. Thus ratio is then applied to project the number of students in each grade from the 1986 to 1996 school years. The early grade populations are estimated by birth rates, migration and other factors.

Present demographic trends indicate a continuation of stagnant to slightly increasing enrollments. This is caused by multiple factors including lower household sizes, relative decrease in population of child bearing age and double income households.

The effect of the Land Use and Housing Plans on future enrollment cannot be definitively determined at this time. However, it is estimated that the projected housing may increase the enrollment projections to some degree, but it student populations will not approach the capacity of the educational facilities as they did in the 1960's and early 1970's.

LIBRARY SERVICES

The West Milford Township Library was founded in 1952 as a private association library on property owned by the West Milford Presbyterian Church. In 1954 the library relocated to larger quarters. A bequest from Claudine MacDonald's estate allowed the Association to purchase land adjacent to the town hall, whereby the present building was constructed in 1970. A few years later, due to space limitations, the Jan Casciano Wing was added to house the Children's Room.

Financial hardship and the community's demand for increased services caused the Council to conduct a referendum. On November 8, 1983 township residents voted for a township takeover of the library.

The Township Library, located on Ridge Road near the Municipal Building, is approximately 6,930 square feet in size. The experience formula for library size and costs, as presented in Urban Planning and Design Criteria, states there should be a library first floor space of 9,880 square feet to 11,115 square feet for a population bracket of 10,000 to 35,000. The formula ascertains that .4 square feet to .45 square feet be available per capita. West Milford, whose population is approximately 24,7000 people, has a library first floor space of 3,465 square feet, or nearly one-third less than the desired space. The total library space, which is .6 square feet to .65 square feet per capita, equals 14,280 to 16,055 square feet. The West Milford library is once again lower than the accepted.

The State of New Jersey has a set of criteria to which the library must adhere to in order to receive state aid. The criteria is based on the 1980 Census which placed the population of West Milford at approximately 23,000. The requirements include employees, library materials and hours of operation.

For the population bracket of 20,000 to 23,999, the state requires the equivalent of six full time employees. West Milford has four full time employees and various part-timers which compose the necessary standard. Libraries within the aforementioned population bracket must have at

least two librarians with a Masters degree, and the library director and senior library assistant fulfill that requirement in the town. Civil Service requires that there be three library employees with Masters degrees. Currently, the junior library assistant is pursuing her degree.

As for library materials, the provision states that one volume per capita be available, and a minimum of 1/10 volume per capita shall be purchased annually. As of December 31, 1985 the township library contained 23,706 volumes on their shelves.

The final criteria is the hours of operation. The state standard is 45 hours per week. The state allows seasonal variations for three months, and for West Milford the hours of operation are reduced during the summer months. Otherwise, the township library exceeds the standard, as they are in operation for 49 hours.

While the library is providing the best services possible, the continued growth of West Milford has created a need for updating the materials available to the residents. The library, within the near future, will have to consider alternate solutions to the space problem. Such options include the expansion of the present facilities, expanding the library through branches or the construction of a new building. There have been several attempts to create branches of the library elsewhere in the community. In 1954 a branch opened in a room of the Newfoundland Methodist Church, and while efforts were made to locate a permanent home for the branch a suitable location could not be found and the branch closed in 1957. In 1973 a branch opened in the Lakeland State Bank Plaza. This branch, whose texts were provided through donations, operated for 27 hours, had 3,000 books and 690 patrons closed in 1977 due to declining circulation and a slash in township aid. Services for the summer were provided in 1975 at Bubbling Springs, and a branch was opened at the Jewish Community Center in Upper Greenwood Lake. This closed two months after it opened. A Bookmobile service was also started for the community in 1977 was subsequently discontinued.

Design Criteria for libraries include easy access, location on a main thoroughfare, located in a subshopping area and its location near a neighborhood center. The present library meets three of the criteria above, but due to the uniqueness of the Township it is diffucult to locate the library branches near specific neighborhood centers. In considering a solution to the growth problem, one must analyze the neighborhood situation. The area that can satisfy the greatest neighborhood population may be a

suitable site for a branch, but it will be necessary to group the individual neighborhoods into larger areas. For the immediate future, this Plan recommends that the Township direct its efforts at the creation of a strong central library facility that will meet the demand of a growing community.

Other future needs that will improve the quality of the materials available to the public include the automation of the card catalog system. Surrounding counties have totally computerized their library facilities, and Passaic County is now in the process of also converting systems. An increase in the number of volumes of text and other publications will be necessary. Many present texts are outdated and can be disposed of, but not until new texts can replace them. While a "cleanout" of the library may help temporarily, the state aid conditions are based upon maintaining a certain amount of reading material. Also, the library hopes to create a video collection and expand upon their cassette collection.

All of the aforementioned needs are based upon funding, and while financial hardships have hindered the growth of the library the onset of state aid will make these needs a reality.

POLICE PROTECTION

Police protection services are provided by the Township's police department, housed in the municipal building at the intersection of Union Valley and Ridge Roads. The police department is staffed with 39 full-time officers, four civilian radio dispatchers, and three clerk typists for a total full-time staff of 46 individuals. Twenty special part-time officers supplement the full-time staff.

The police department has approximately 5,000 square feet of floor area within which to operate. The space includes a communications desk, public lobby, records bureau, detective bureau, patrol office, traffic office, patrol commander's office, chief's office, interview room, report writing room, police photography dark room, locker room, squad room, and four detention cells

The police department operates nine marked patrol cars and four unmarked vehicles. Each vehicle is equipped with a wide range of safety and protective equipment, including a resuscitator, first aid kit, 100 feet of nylon rope, a life ring, a life jacket, fire extinguisher, ax, flares, measuring wheel and a 12 gauge shotgun. In addition, the patrol vehicles are equipped with "moving radar" to enforce traffic regulations.

The department has six officers who are certified divers and form the police scuba team. The department has eight men assigned to the "special operations unit" and they are trained in rescue operations and special weapons.

When compared to an estimated population of approximately 24,000 people, the ratio of full-time municipal police officers for each 1,000 persons in the township is 1.6. This is in comparison with a ratio of 2.3 for the entire State of New Jersey; 2.1 for Passaic County; 2.3 for Bergen County; 2.0 for Morris County; and 1.1 for Sussex County, each as determined by the "Uniform Crime Reporting Program" of New Jersey.

The police employee rates per 1,000 population presented here should not be construed as being recommended ratios. The determination of police strength for any municipality or jurisdiction should be based on the numerous factors which created the need for police services. These factors vary in type and degree from place to place and include such considerations as geographic location, seasonal populations, land area, natural and jurisdictional boundaries, density, composition of the population and the existing road network.

The future growth of the Township would, by necessity, create a demand for additional police services and protection. How this relates to increases in manpower or capital needs for the Department is dependent upon the affect of population growth on the above mentioned criteria.

FIRST AID AND FIRE FACILITIES

The first aid squads operate out of three locations in West Milford Township. The West Milford First Aid Squad operates out of facilities located on Route 23 near the Oak Ridge section of the township and from a facility located behind the municipal building on Ridge Road. The third location is operated by the Upper Greenwood Lake First Aid Squad whose facility is located on the Warwick Turnpike in close proximity to the New York State border. All first aid squads receive financial assistance from the Township, supplemented by annual fund raising drives.

There are presently six fire departments within West Milford Township. The districts to which the fire companies respond to emergencies are based on the election ward districts. The following fire companies are listed below and their locations and districts are shown on Figure 16.

Apshawa: The Apshawa Fire Company is located on Macopin Road just SE of Weaver Road. Their district essentially encompasses the SE section of the township. It begins at the point where Rte 23 meets New City Road and follows diagonally along the properties that border Germantown Road to the east up to the middle of Saw Mill Road. From there the district moves east and intersects Macopin Road near North Glenwood Road and continues on an easterly progression. The district takes in all of Shady Lake and from there continues eastward on Otterhole Road. The major developments that are included in this district are High Crest Lake, Wonder Lake, Trails End, and Mt. Springs.

Macopin: The Macopin Fire Company is situated on Macopin Road just slightly north of where the high school is located. The Macopin district covers that area NW of where the Apshawa district begins to the point where Echo Lake meets Rte 23 and moves diagonally north to the intersection of Union Valley and Gould Roads. At this intersection the district line progresses east to the intersection of Macopin and Cahill Cross Roads, and from there continues intersecting Macopin just south of Carpi Lake and continues towards the Lake Sonoma area. The major developments that are included in this district are Lindy Lake, Gordon Lake, Postbrook, Mt. Glen Lakes, Olde Milford Estates, Highview, Tall Timbers, and Kitchell Lake.

Community: The Newfoundland Community Fire Company is located on Rte 23 North just east of the turnoff for Oak Ridge Road. The Newfoundland district covers that area NE of where the Macopin district begins and progresses east to where the township meets the Hardyston Township border and SE whereby including all of the Oak Ridge area. The district runs diagonally from the same origin as Macopin and progresses towards the Union Valley and Gould Road intersections. From this point the district moves directly east to the northern part of Henderson Road and ends at the Hardyston Township border. The major developments that are included in this district are Hi-Lo Acres, Old Milford, Allison Acres, Crestmere, Cleveland Development, Farm Crest Acres, Oak Hills, Sun Pine Valley, and Church Hill.

West Milford: The West Milford Fire Company is located on Ridge Road just south of Town Hall. It covers the central portion of the Township. Beginning at the Union Valley and Gould Roads intersection the district line progresses diagonally towards the Macopin and Cahill Cross Roads intersection and covers that area NE of this line. The district line moves west just below the Morsetown Road area and progresses diagonally north covering the Mountain Circle neighborhood to where it meets Marshall Hill Road, whereby

bisecting the Birch Hill development. From there the district incorporates all of the Gwinear development, crosses Union Valley Road and meets the Upper Greenwood Lake boundary line . The major developments that are included in this district are Crescent Park, Bald Eagle Village, West Milford Lakes, Pinecliff Lake, Wallisch, Gwinear and part of Birch Hill.

Greenwood Forest: The Greenwood Forest Fire Company is located on Greenwood Lake Turnpike near Laurel Avenue. This district follows along the West Milford boundary line and encompasses all the area to the NW, and the area directly west of the Upper Greenwood Lake border. The major developments that are included in this district are Awosting and Lakeside.

Upper Greenwood Lake: The Upper Greenwood Lake Fire Company is located on Warwick Turnpike between Riegler Road and Fairview Drive. This district encompasses the area SE near the point where Clinton Road comes upon Clinton Reservoir and to the NE where West Milford borders Warwick, New York. The major developments that are included in this district are Upper Greenwood Lake and Mt. Laurel.

The Fire Department has a staff of three full-time and one part-time employees. The Subcode and Fire Official conducts inspections on new construction and existing structures, as well as reviewing site plans. The Fire Protection Inspectors inspect existing structures based on a schedule. Some structures are inspected as much a four times a year, and there are also periodic spot checks conducted.

There are two elected officials that oversee the six fire companies in West Milford. They are the Commissioner and the Deputy Fire Commissioner. Within the companies themselves there are the Chiefs, who handle the day-to-day operations of the company they serve.

There are approximately 220 volunteer firemen to date. While the night time shift is adequately staffed for most of the companies, there is a problem in the staffing of the day shift. There are two shifts; the day from 6 AM to 6PM and the night shift from 6 PM to 6 AM. On the average there is about 1 to 2 men per company on the day shift. Some companies have more men only because their volunteers happen to work in West Milford, or work for the Township itself.

In answering a one alarm fire, three fire trucks are required. It takes five men to adequately manage one truck. During a night fire there can be as much as twenty five men responding to one fire, whereas in the day usually two men are available to operate one truck.

The issues that concern the West Milford Fire Department in continuing to provide efficient and adequate fire protection include the reconstruction of the present fire districts, and increasing the present manpower.

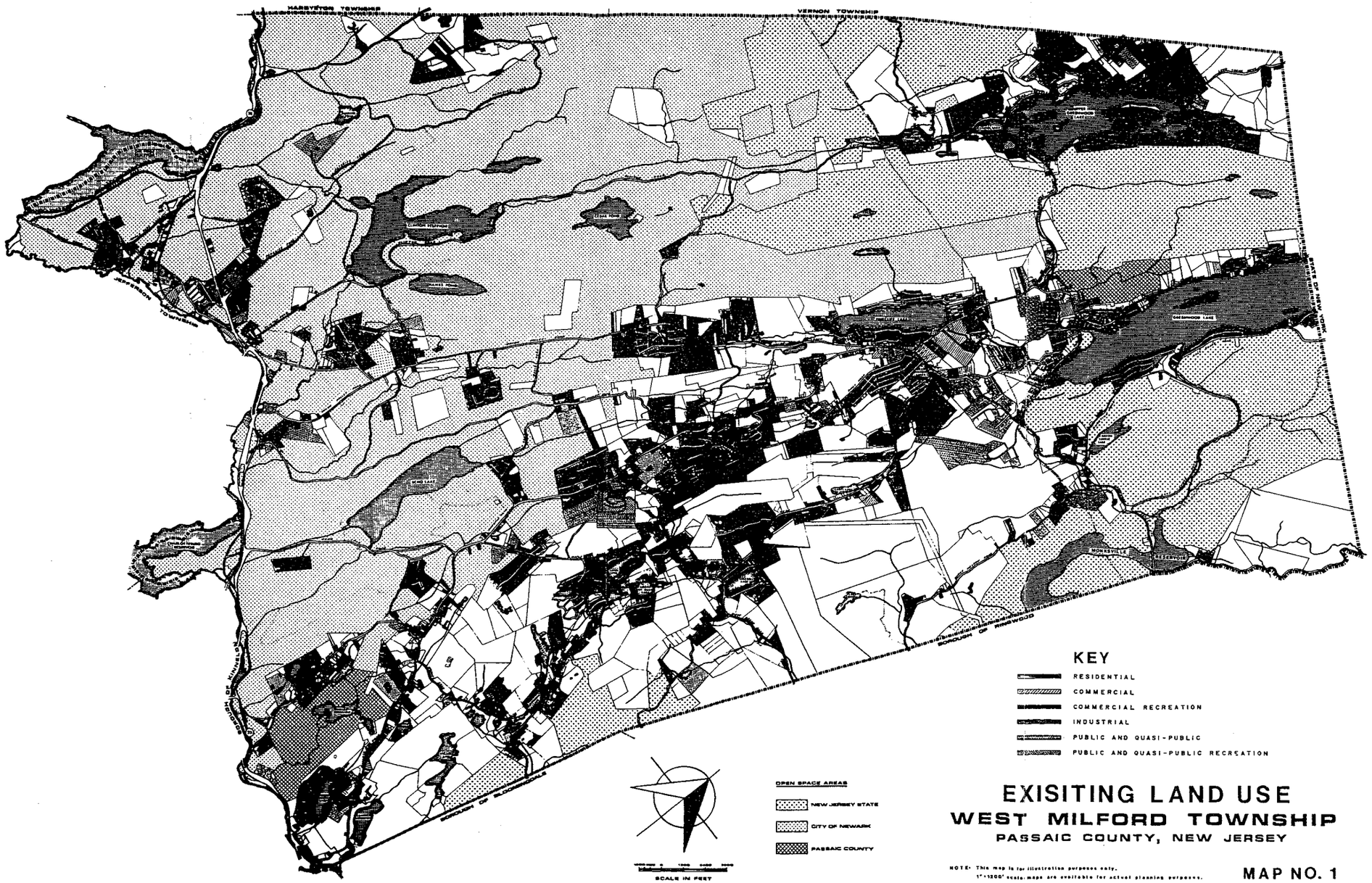
As discussed previously, the present fire districts are based on the election ward districts that were created nearly 20 years ago. The overall composition of the township in terms of growth and development has greatly been altered since the creation of the election boundaries. It is due to the expansion of the township that these boundaries are antiquated and should be realigned so as to incorporate the new development, as well as maintaining the standard response time.

It is apparent that the fire districts should be reconstructed based on response time and future development, especially the types and places to which the new construction will take place. At this time most of the slated development will occur along the Union Valley Road corridor, Macopin Road and the Greenwood Lake area. This in turn will mean that the Macopin, West Milford and Greenwood Forest Fire Companies will have more structures located within their districts to service.

The other important issue facing the Fire Department concerns the lack of manpower during the daytime. Many of the volunteers work during the daytime, with a major percentage having their jobs outside of the township. Also, West Milford is considered a bedroom community. Due to the family structure that exists today (i.e. both parents in the workforce), the time that is spent with the children is more scarce and precious, and unfortunately, volunteering cuts into what time is available.

Closely related to redesigning the districts and the availability of manpower is the issue of equipment. With different types of development occurring in the Township there arises the need to update the equipment so as to provide proper service in the event of an emergency.

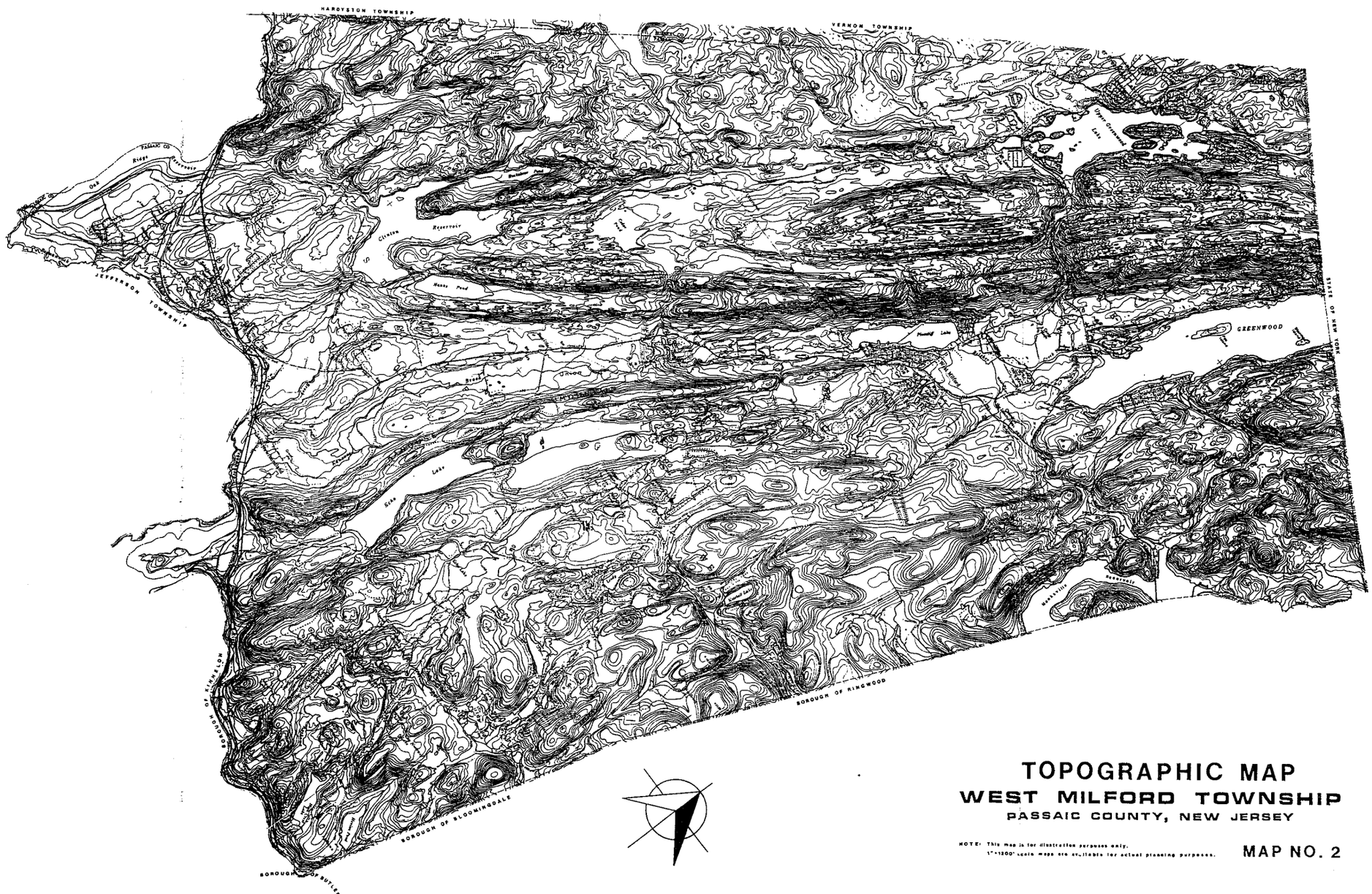
A separate study conducted by a professional fire protection consultant may aid the township in evaluating the township's fire protection needs, and in suggesting possible solutions in upgrading the services presently provided by the West Milford Township Fire Department.



EXISITING LAND USE
WEST MILFORD TOWNSHIP
PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustration purposes only.
1"=1200' scale maps are available for actual planning purposes.

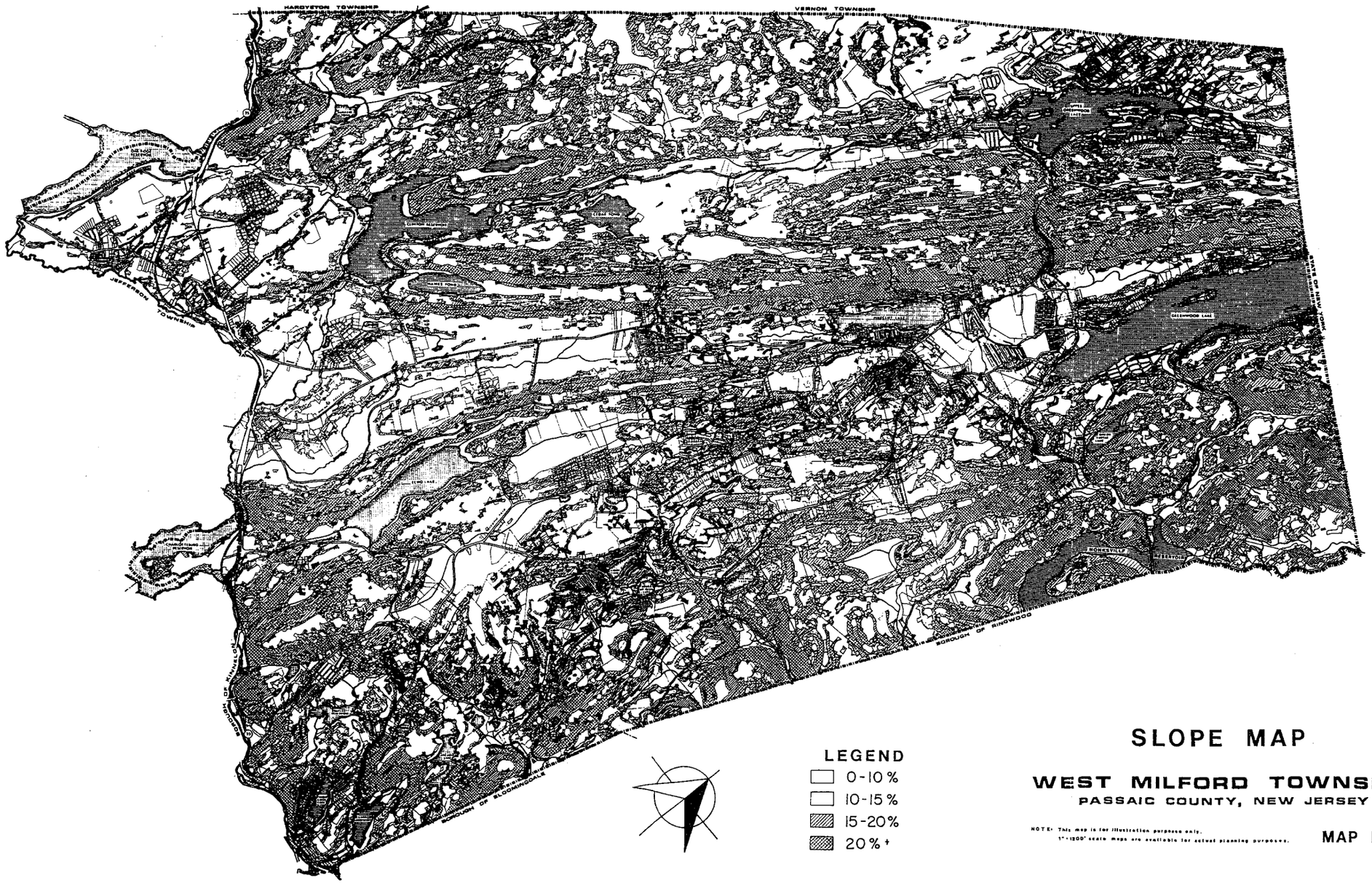
MAP NO. 1



TOPOGRAPHIC MAP
WEST MILFORD TOWNSHIP
PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustration purposes only.
1"=1200' scale maps are available for actual planning purposes.

MAP NO. 2



LEGEND

- 0-10%
- 10-15%
- 15-20%
- 20%+

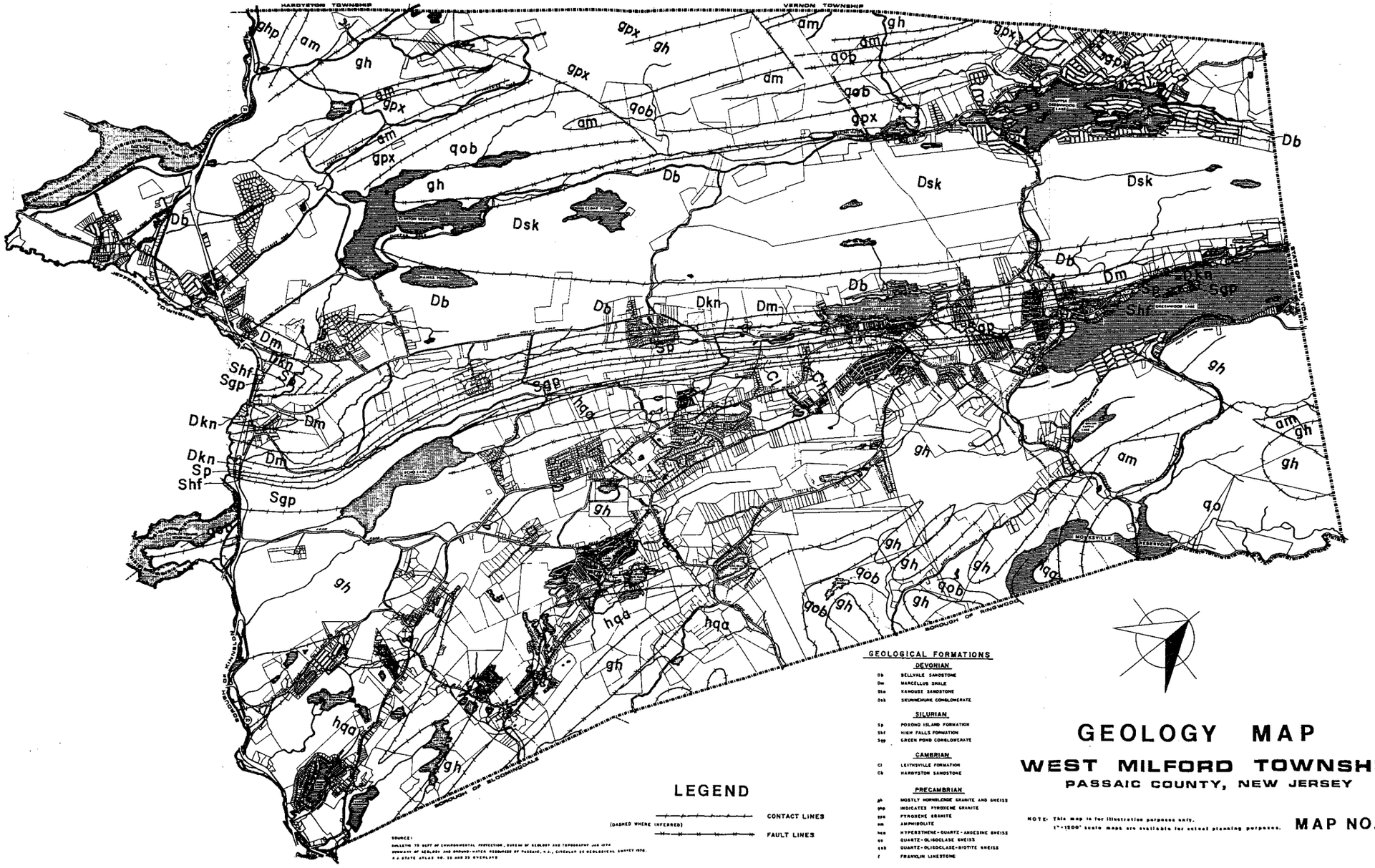
SLOPE MAP

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustration purposes only. 1"=1200' scale maps are available for actual planning purposes.

MAP NO. 3



LEGEND

CONTACT LINES (DASHED WHERE INFERRED)

FAULT LINES

SOURCE:
BULLETIN 70 DEPT OF ENVIRONMENTAL PROTECTION, BUREAU OF GEOLOGY AND TOPOGRAPHY JAN 1974
SUMMARY OF GEOLOGY AND GROUND-WATER RESOURCES OF PASSAIC, N.J., CIRCULAR 24 GEOLOGICAL SURVEY 1970.
N.J. STATE ATLAS NO. 22 AND 23 OVERLAYS

GEOLOGICAL FORMATIONS

DEVONIAN

Db	BELLVALE SANDSTONE
Dm	MARCELLUS SHALE
Dko	KANOUSE SANDSTONE
Dsk	SKUNNEMUNK CONGLOMERATE

SILURIAN

Sp	POXONO ISLAND FORMATION
Shf	HIGH FALLS FORMATION
Sgp	GREEN POND CONGLOMERATE

CAMBRIAN

Cl	LEITHSVILLE FORMATION
Ch	HARDYSTON SANDSTONE

PRECAMBRIAN

gh	MOSTLY HORNBLENDE GRANITE AND GNEISS
ghp	INDICATES PYROXENE GRANITE
gpx	PYROXENE GRANITE
am	AMPHIBOLITE
hqa	HYPERSTHENE-QUARTZ-ANDESINE GNEISS
qo	QUARTZ-OLIGOCLASE GNEISS
qob	QUARTZ-OLIGOCLASE-BIOTITE GNEISS
f	FRANKLIN LIMESTONE

GEOLOGY MAP

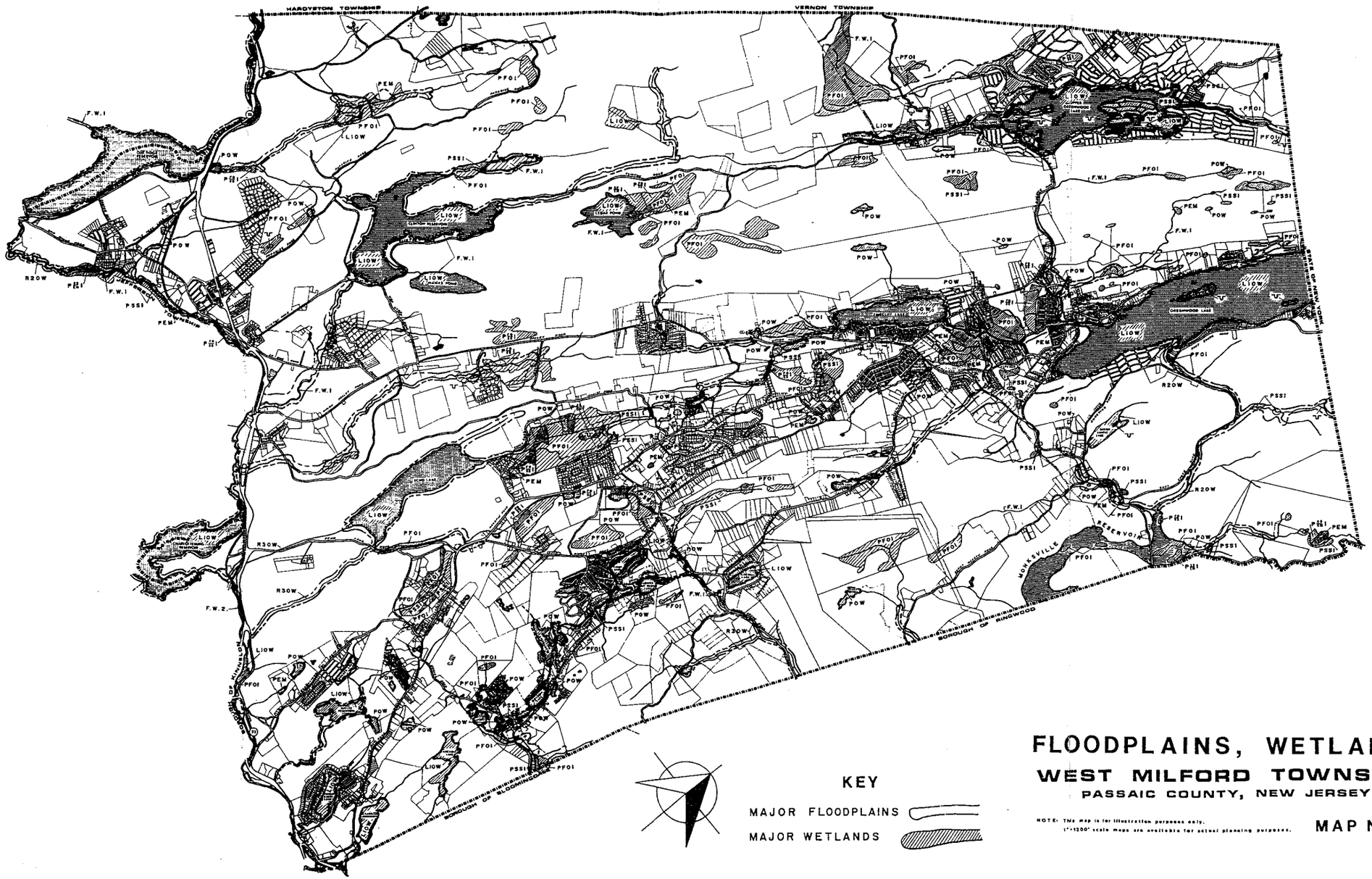
WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustration purposes only.
1"=1200' scale maps are available for actual planning purposes.

MAP NO. 4

SYMBOL	SOIL TYPE
AnC	Annsville extremely stony soils, 0 to 15 percent slopes
AnD	Annsville extremely stony soils, 15 to 25 percent slopes
BaB	Bartley very stony sandy loam, 0 to 8 percent slopes
BaC	Bartley very stony sandy loam, 8 to 15 percent slopes
BaC	Bartley very stony sandy loam, 8 to 15 percent slopes
BbB	Bartley extremely stony sandy loam, 0 to 15 percent slopes
BbC	Bartley extremely stony sandy loam, 8 to 15 percent slopes
BbD	Bartley extremely stony sandy loam, 15 to 25 percent slopes
BcC	Bartley very rocky sandy loam, 0 to 15 percent slopes
BcD	Bartley very rocky sandy loam, 15 to 25 percent slopes
BdB	Bartley extremely rocky sandy loam, 0 to 8 percent slopes
BdC	Bartley extremely rocky sandy loam, 8 to 15 percent slopes
BdD	Bartley extremely rocky sandy loam, 15 to 25 percent slopes
BeC	Bartley extremely bouldery sandy loam, 0 to 15 percent slopes
BeD	Bartley extremely bouldery sandy loam, 15 to 25 percent slopes
BfB	Bartley very bouldery sandy loam, 0 to 8 percent slopes
BfC	Bartley very bouldery sandy loam, 8 to 15 percent slopes
BfD	Bartley very bouldery sandy loam, 15 to 25 percent slopes
BgB	Bartley very rocky sandy loam, 0 to 8 percent slopes
BgC	Bartley very rocky sandy loam, 8 to 15 percent slopes
BgD	Bartley very rocky sandy loam, 15 to 25 percent slopes
BhB	Bartley very bouldery sandy loam, 0 to 8 percent slopes
BhC	Bartley very bouldery sandy loam, 8 to 15 percent slopes
BhD	Bartley very bouldery sandy loam, 15 to 25 percent slopes
BkB	Bartley very rocky sandy loam, 0 to 8 percent slopes
BkC	Bartley very rocky sandy loam, 8 to 15 percent slopes
BkD	Bartley very rocky sandy loam, 15 to 25 percent slopes
BmB	Bartley very bouldery sandy loam, 0 to 8 percent slopes
BmC	Bartley very bouldery sandy loam, 8 to 15 percent slopes
BmD	Bartley very bouldery sandy loam, 15 to 25 percent slopes
BnB	Bartley very rocky sandy loam, 0 to 8 percent slopes
BnC	Bartley very rocky sandy loam, 8 to 15 percent slopes
BnD	Bartley very rocky sandy loam, 15 to 25 percent slopes
BoB	Bartley very bouldery sandy loam, 0 to 8 percent slopes
BoC	Bartley very bouldery sandy loam, 8 to 15 percent slopes
BoD	Bartley very bouldery sandy loam, 15 to 25 percent slopes
BpB	Bartley very rocky sandy loam, 0 to 8 percent slopes
BpC	Bartley very rocky sandy loam, 8 to 15 percent slopes
BpD	Bartley very rocky sandy loam, 15 to 25 percent slopes
BrB	Bartley very bouldery sandy loam, 0 to 8 percent slopes
BrC	Bartley very bouldery sandy loam, 8 to 15 percent slopes
BrD	Bartley very bouldery sandy loam, 15 to 25 percent slopes
BsB	Bartley very rocky sandy loam, 0 to 8 percent slopes
BsC	Bartley very rocky sandy loam, 8 to 15 percent slopes
BsD	Bartley very rocky sandy loam, 15 to 25 percent slopes
BtB	Bartley very bouldery sandy loam, 0 to 8 percent slopes
BtC	Bartley very bouldery sandy loam, 8 to 15 percent slopes
BtD	Bartley very bouldery sandy loam, 15 to 25 percent slopes
BuB	Bartley very rocky sandy loam, 0 to 8 percent slopes
BuC	Bartley very rocky sandy loam, 8 to 15 percent slopes
BuD	Bartley very rocky sandy loam, 15 to 25 percent slopes
BvB	Bartley very bouldery sandy loam, 0 to 8 percent slopes
BvC	Bartley very bouldery sandy loam, 8 to 15 percent slopes
BvD	Bartley very bouldery sandy loam, 15 to 25 percent slopes
BwB	Bartley very rocky sandy loam, 0 to 8 percent slopes
BwC	Bartley very rocky sandy loam, 8 to 15 percent slopes
BwD	Bartley very rocky sandy loam, 15 to 25 percent slopes
BxB	Bartley very bouldery sandy loam, 0 to 8 percent slopes
BxC	Bartley very bouldery sandy loam, 8 to 15 percent slopes
BxD	Bartley very bouldery sandy loam, 15 to 25 percent slopes
ByB	Bartley very rocky sandy loam, 0 to 8 percent slopes
ByC	Bartley very rocky sandy loam, 8 to 15 percent slopes
ByD	Bartley very rocky sandy loam, 15 to 25 percent slopes
BzB	Bartley very bouldery sandy loam, 0 to 8 percent slopes
BzC	Bartley very bouldery sandy loam, 8 to 15 percent slopes
BzD	Bartley very bouldery sandy loam, 15 to 25 percent slopes
CaB	Califon loam, 0 to 8 percent slopes
CaC	Califon loam, 8 to 15 percent slopes
CaD	Califon loam, 15 to 25 percent slopes
CbB	Califon very stony loam, 0 to 8 percent slopes
CbC	Califon very stony loam, 8 to 15 percent slopes
CbD	Califon very stony loam, 15 to 25 percent slopes
CcB	Califon very rocky loam, 0 to 8 percent slopes
CcC	Califon very rocky loam, 8 to 15 percent slopes
CcD	Califon very rocky loam, 15 to 25 percent slopes
CdB	Califon very bouldery loam, 0 to 8 percent slopes
CdC	Califon very bouldery loam, 8 to 15 percent slopes
CdD	Califon very bouldery loam, 15 to 25 percent slopes
CeB	Califon very rocky loam, 0 to 8 percent slopes
CeC	Califon very rocky loam, 8 to 15 percent slopes
CeD	Califon very rocky loam, 15 to 25 percent slopes
CfB	Califon very bouldery loam, 0 to 8 percent slopes
CfC	Califon very bouldery loam, 8 to 15 percent slopes
CfD	Califon very bouldery loam, 15 to 25 percent slopes
CgB	Califon very rocky loam, 0 to 8 percent slopes
CgC	Califon very rocky loam, 8 to 15 percent slopes
CgD	Califon very rocky loam, 15 to 25 percent slopes
ChB	Califon very bouldery loam, 0 to 8 percent slopes
ChC	Califon very bouldery loam, 8 to 15 percent slopes
ChD	Califon very bouldery loam, 15 to 25 percent slopes
CkB	Califon very rocky loam, 0 to 8 percent slopes
CkC	Califon very rocky loam, 8 to 15 percent slopes
CkD	Califon very rocky loam, 15 to 25 percent slopes
CmB	Califon very bouldery loam, 0 to 8 percent slopes
CmC	Califon very bouldery loam, 8 to 15 percent slopes
CmD	Califon very bouldery loam, 15 to 25 percent slopes
CnB	Califon very rocky loam, 0 to 8 percent slopes
CnC	Califon very rocky loam, 8 to 15 percent slopes
CnD	Califon very rocky loam, 15 to 25 percent slopes
CoB	Califon very bouldery loam, 0 to 8 percent slopes
CoC	Califon very bouldery loam, 8 to 15 percent slopes
CoD	Califon very bouldery loam, 15 to 25 percent slopes
CpB	Califon very rocky loam, 0 to 8 percent slopes
CpC	Califon very rocky loam, 8 to 15 percent slopes
CpD	Califon very rocky loam, 15 to 25 percent slopes
CrB	Califon very bouldery loam, 0 to 8 percent slopes
CrC	Califon very bouldery loam, 8 to 15 percent slopes
CrD	Califon very bouldery loam, 15 to 25 percent slopes
CsB	Califon very rocky loam, 0 to 8 percent slopes
CsC	Califon very rocky loam, 8 to 15 percent slopes
CsD	Califon very rocky loam, 15 to 25 percent slopes
CtB	Califon very bouldery loam, 0 to 8 percent slopes
CtC	Califon very bouldery loam, 8 to 15 percent slopes
CtD	Califon very bouldery loam, 15 to 25 percent slopes
CuB	Califon very rocky loam, 0 to 8 percent slopes
CuC	Califon very rocky loam, 8 to 15 percent slopes
CuD	Califon very rocky loam, 15 to 25 percent slopes
CvB	Califon very bouldery loam, 0 to 8 percent slopes
CvC	Califon very bouldery loam, 8 to 15 percent slopes
CvD	Califon very bouldery loam, 15 to 25 percent slopes
CwB	Califon very rocky loam, 0 to 8 percent slopes
CwC	Califon very rocky loam, 8 to 15 percent slopes
CwD	Califon very rocky loam, 15 to 25 percent slopes
CxB	Califon very bouldery loam, 0 to 8 percent slopes
CxC	Califon very bouldery loam, 8 to 15 percent slopes
CxD	Califon very bouldery loam, 15 to 25 percent slopes
CyB	Califon very rocky loam, 0 to 8 percent slopes
CyC	Califon very rocky loam, 8 to 15 percent slopes
CyD	Califon very rocky loam, 15 to 25 percent slopes
CzB	Califon very bouldery loam, 0 to 8 percent slopes
CzC	Califon very bouldery loam, 8 to 15 percent slopes
CzD	Califon very bouldery loam, 15 to 25 percent slopes
DaB	Dalton very stony loam, 0 to 8 percent slopes
DaC	Dalton very stony loam, 8 to 15 percent slopes
DaD	Dalton very stony loam, 15 to 25 percent slopes
DbB	Dalton very rocky loam, 0 to 8 percent slopes
DbC	Dalton very rocky loam, 8 to 15 percent slopes
DbD	Dalton very rocky loam, 15 to 25 percent slopes
DcB	Dalton very bouldery loam, 0 to 8 percent slopes
DcC	Dalton very bouldery loam, 8 to 15 percent slopes
DcD	Dalton very bouldery loam, 15 to 25 percent slopes
DdB	Dalton very rocky loam, 0 to 8 percent slopes
DdC	Dalton very rocky loam, 8 to 15 percent slopes
DdD	Dalton very rocky loam, 15 to 25 percent slopes
DeB	Dalton very bouldery loam, 0 to 8 percent slopes
DeC	Dalton very bouldery loam, 8 to 15 percent slopes
DeD	Dalton very bouldery loam, 15 to 25 percent slopes
DfB	Dalton very rocky loam, 0 to 8 percent slopes
DfC	Dalton very rocky loam, 8 to 15 percent slopes
DfD	Dalton very rocky loam, 15 to 25 percent slopes
DgB	Dalton very bouldery loam, 0 to 8 percent slopes
DgC	Dalton very bouldery loam, 8 to 15 percent slopes
DgD	Dalton very bouldery loam, 15 to 25 percent slopes
DhB	Dalton very rocky loam, 0 to 8 percent slopes
DhC	Dalton very rocky loam, 8 to 15 percent slopes
DhD	Dalton very rocky loam, 15 to 25 percent slopes
DkB	Dalton very bouldery loam, 0 to 8 percent slopes
DkC	Dalton very bouldery loam, 8 to 15 percent slopes
DkD	Dalton very bouldery loam, 15 to 25 percent slopes
DmB	Dalton very rocky loam, 0 to 8 percent slopes
DmC	Dalton very rocky loam, 8 to 15 percent slopes
DmD	Dalton very rocky loam, 15 to 25 percent slopes
DnB	Dalton very bouldery loam, 0 to 8 percent slopes
DnC	Dalton very bouldery loam, 8 to 15 percent slopes
DnD	Dalton very bouldery loam, 15 to 25 percent slopes
DoB	Dalton very rocky loam, 0 to 8 percent slopes
DoC	Dalton very rocky loam, 8 to 15 percent slopes
DoD	Dalton very rocky loam, 15 to 25 percent slopes
DpB	Dalton very bouldery loam, 0 to 8 percent slopes
DpC	Dalton very bouldery loam, 8 to 15 percent slopes
DpD	Dalton very bouldery loam, 15 to 25 percent slopes
DrB	Dalton very rocky loam, 0 to 8 percent slopes
DrC	Dalton very rocky loam, 8 to 15 percent slopes
DrD	Dalton very rocky loam, 15 to 25 percent slopes
DsB	Dalton very bouldery loam, 0 to 8 percent slopes
DsC	Dalton very bouldery loam, 8 to 15 percent slopes
DsD	Dalton very bouldery loam, 15 to 25 percent slopes
DtB	Dalton very rocky loam, 0 to 8 percent slopes
DtC	Dalton very rocky loam, 8 to 15 percent slopes
DtD	Dalton very rocky loam, 15 to 25 percent slopes
DuB	Dalton very bouldery loam, 0 to 8 percent slopes
DuC	Dalton very bouldery loam, 8 to 15 percent slopes
DuD	Dalton very bouldery loam, 15 to 25 percent slopes
DvB	Dalton very rocky loam, 0 to 8 percent slopes
DvC	Dalton very rocky loam, 8 to 15 percent slopes
DvD	Dalton very rocky loam, 15 to 25 percent slopes
DwB	Dalton very bouldery loam, 0 to 8 percent slopes
DwC	Dalton very bouldery loam, 8 to 15 percent slopes
DwD	Dalton very bouldery loam, 15 to 25 percent slopes
DxB	Dalton very rocky loam, 0 to 8 percent slopes
DxC	Dalton very rocky loam, 8 to 15 percent slopes
DxD	Dalton very rocky loam, 15 to 25 percent slopes
DyB	Dalton very bouldery loam, 0 to 8 percent slopes
DyC	Dalton very bouldery loam, 8 to 15 percent slopes
DyD	Dalton very bouldery loam, 15 to 25 percent slopes
DzB	Dalton very rocky loam, 0 to 8 percent slopes
DzC	Dalton very rocky loam, 8 to 15 percent slopes
DzD	Dalton very rocky loam, 15 to 25 percent slopes
EaB	Edneyville very stony loam, 0 to 8 percent slopes
EaC	Edneyville very stony loam, 8 to 15 percent slopes
EaD	Edneyville very stony loam, 15 to 25 percent slopes
EbB	Edneyville very rocky loam, 0 to 8 percent slopes
EbC	Edneyville very rocky loam, 8 to 15 percent slopes
EbD	Edneyville very rocky loam, 15 to 25 percent slopes
EcB	Edneyville very bouldery loam, 0 to 8 percent slopes
EcC	Edneyville very bouldery loam, 8 to 15 percent slopes
EcD	Edneyville very bouldery loam, 15 to 25 percent slopes
EdB	Edneyville very rocky loam, 0 to 8 percent slopes
EdC	Edneyville very rocky loam, 8 to 15 percent slopes
EdD	Edneyville very rocky loam, 15 to 25 percent slopes
EeB	Edneyville very bouldery loam, 0 to 8 percent slopes
EeC	Edneyville very bouldery loam, 8 to 15 percent slopes
EeD	Edneyville very bouldery loam, 15 to 25 percent slopes
EfB	Edneyville very rocky loam, 0 to 8 percent slopes
EfC	Edneyville very rocky loam, 8 to 15 percent slopes
EfD	Edneyville very rocky loam, 15 to 25 percent slopes
EgB	Edneyville very bouldery loam, 0 to 8 percent slopes
EgC	Edneyville very bouldery loam, 8 to 15 percent slopes
EgD	Edneyville very bouldery loam, 15 to 25 percent slopes
EhB	Edneyville very rocky loam, 0 to 8 percent slopes
EhC	Edneyville very rocky loam, 8 to 15 percent slopes
EhD	Edneyville very rocky loam, 15 to 25 percent slopes
EkB	Edneyville very bouldery loam, 0 to 8 percent slopes
EkC	Edneyville very bouldery loam, 8 to 15 percent slopes
EkD	Edneyville very bouldery loam, 15 to 25 percent slopes
EmB	Edneyville very rocky loam, 0 to 8 percent slopes
EmC	Edneyville very rocky loam, 8 to 15 percent slopes
EmD	Edneyville very rocky loam, 15 to 25 percent slopes
EnB	Edneyville very bouldery loam, 0 to 8 percent slopes
EnC	Edneyville very bouldery loam, 8 to 15 percent slopes
EnD	Edneyville very bouldery loam, 15 to 25 percent slopes
EoB	Edneyville very rocky loam, 0 to 8 percent slopes
EoC	Edneyville very rocky loam, 8 to 15 percent slopes
EoD	Edneyville very rocky loam, 15 to 25 percent slopes
EpB	Edneyville very bouldery loam, 0 to 8 percent slopes
EpC	Edneyville very bouldery loam, 8 to 15 percent slopes
EpD	Edneyville very bouldery loam, 15 to 25 percent slopes
ErB	Edneyville very rocky loam, 0 to 8 percent slopes
ErC	Edneyville very rocky loam, 8 to 15 percent slopes
ErD	Edneyville very rocky loam, 15 to 25 percent slopes
EsB	Edneyville very bouldery loam, 0 to 8 percent slopes
EsC	Edneyville very bouldery loam, 8 to 15 percent slopes
EsD	Edneyville very bouldery loam, 15 to 25 percent slopes
EtB	Edneyville very rocky loam, 0 to 8 percent slopes
EtC	Edneyville very rocky loam, 8 to 15 percent slopes
EtD	Edneyville very rocky loam, 15 to 25 percent slopes
EuB	Edneyville very bouldery loam, 0 to 8 percent slopes
EuC	Edneyville very bouldery loam, 8 to 15 percent slopes
EuD	Edneyville very bouldery loam, 15 to 25 percent slopes
EvB	Edneyville very rocky loam, 0 to 8 percent slopes
EvC	Edneyville very rocky loam, 8 to 15 percent slopes
EvD	Edneyville very rocky loam, 15 to 25 percent slopes
EwB	Edneyville very bouldery loam, 0 to 8 percent slopes
EwC	Edneyville very bouldery loam, 8 to 15 percent slopes
EwD	Edneyville very bouldery loam, 15 to 25 percent slopes
ExB	Edneyville very rocky loam, 0 to 8 percent slopes
ExC	Edneyville very rocky loam, 8 to 15 percent slopes
ExD	Edneyville very rocky loam, 15 to 25 percent slopes
EyB	Edneyville very bouldery loam, 0 to 8 percent slopes
EyC	Edneyville very bouldery loam, 8 to 15 percent slopes
EyD	Edneyville very bouldery loam, 15 to 25 percent slopes
EzB	Edneyville very rocky loam, 0 to 8 percent slopes
EzC	Edneyville very rocky loam, 8 to 15 percent slopes
EzD	Edneyville very rocky loam, 15 to 25 percent slopes
FaB	Fairton very stony loam, 0 to 8 percent slopes
FaC	Fairton very stony loam, 8 to 15 percent slopes
FaD	Fairton very stony loam, 15 to 25 percent slopes
FbB	Fairton very rocky loam, 0 to 8 percent slopes
FbC	Fairton very rocky loam, 8 to 15 percent slopes
FbD	Fairton very rocky loam, 15 to 25 percent slopes
FcB	Fairton very bouldery loam, 0 to 8 percent slopes
FcC	Fairton very bouldery loam, 8 to 15 percent slopes
FcD	Fairton very bouldery loam, 15 to 25 percent slopes
FdB	Fairton very rocky loam, 0 to 8 percent slopes
FdC	Fairton very rocky loam, 8 to 15 percent slopes
FdD	Fairton very rocky loam, 15 to 25 percent slopes
FeB	Fairton very bouldery loam, 0 to 8 percent slopes
FeC	Fairton very bouldery loam, 8 to 15 percent slopes
FeD	Fairton very bouldery loam, 15 to 25 percent slopes
FfB	Fairton very rocky loam, 0 to 8 percent slopes
FfC	Fairton very rocky loam, 8 to 15 percent slopes
FfD	Fairton very rocky loam, 15 to 25 percent slopes
FgB	Fairton very bouldery loam, 0 to 8 percent slopes
FgC	Fairton very bouldery loam, 8 to 15 percent slopes
FgD	Fairton very bouldery loam, 15 to 25 percent slopes
FhB	Fairton very rocky loam, 0 to 8 percent slopes
FhC	Fairton very rocky loam, 8 to 15 percent slopes
FhD	Fairton very rocky loam, 15 to 25 percent slopes
FkB	Fairton very bouldery loam, 0 to 8 percent slopes
FkC	Fairton very bouldery loam, 8 to 15 percent slopes
FkD	Fairton very bouldery loam, 15 to 25 percent slopes
FmB	Fairton very rocky loam, 0 to 8 percent slopes
FmC	Fairton very rocky loam, 8 to 15 percent slopes
FmD	Fairton very rocky loam, 15 to 25 percent slopes
FnB	Fairton very bouldery loam, 0 to 8 percent slopes
FnC	Fairton very bouldery loam, 8 to 15 percent slopes
FnD	Fairton very bouldery loam, 15 to 25 percent slopes
FoB	Fairton very rocky loam, 0 to 8 percent slopes
FoC	Fairton very rocky loam, 8 to 15 percent slopes
FoD	Fairton very rocky loam, 15 to 25 percent slopes
FpB	Fairton very bouldery loam, 0 to 8 percent slopes
FpC	Fairton very bouldery loam, 8 to 15 percent slopes
FpD	Fairton very bouldery loam, 15 to 25 percent slopes
FrB	Fairton very rocky loam, 0 to 8 percent slopes
FrC	Fairton very rocky loam, 8 to 15 percent slopes
FrD	Fairton very rocky loam, 15 to 25 percent slopes
FsB	Fairton very bouldery loam, 0 to 8 percent slopes
FsC	Fairton very bouldery loam, 8 to 15 percent slopes
FsD	Fairton very bouldery loam, 15 to 25 percent slopes
FtB	Fairton very rocky loam, 0 to 8 percent slopes
FtC	Fairton very rocky loam, 8 to 15 percent slopes
FtD	Fairton very rocky loam, 15 to 25 percent slopes
FuB	Fairton very bouldery loam, 0 to 8 percent slopes
FuC	Fairton very bouldery loam, 8 to 15 percent slopes
FuD	Fairton very bouldery loam, 15 to 25 percent slopes
FvB	Fairton very rocky loam, 0 to 8 percent slopes
FvC	Fairton very rocky loam, 8 to 15 percent slopes
FvD	Fairton very rocky loam, 15 to 25 percent slopes
FwB	Fairton very bouldery loam, 0 to 8 percent slopes
FwC	Fairton very bouldery loam, 8 to 15 percent slopes
FwD	Fairton very bouldery loam, 15 to 25 percent slopes
FxB	Fairton very rocky loam, 0 to 8 percent slopes
FxC	Fairton very rocky loam, 8 to 15 percent slopes
FxD	Fairton very rocky loam, 15 to 25 percent slopes
FyB	Fairton very bouldery loam, 0 to 8 percent slopes
FyC	Fairton very bouldery loam, 8 to 15 percent slopes
FyD	Fairton very bouldery loam, 15 to 25 percent slopes
FzB	Fairton very rocky loam, 0 to 8 percent slopes
FzC	Fairton very rocky loam, 8 to 15 percent slopes
FzD	Fairton very rocky loam, 15 to 25 percent slopes
GaB	Gaila very stony loam, 0 to 8 percent slopes
GaC	Gaila very stony loam, 8 to 15 percent slopes
GaD	Gaila very stony loam, 15 to 25 percent slopes
GbB	Gaila very rocky loam, 0 to 8 percent slopes
GbC	Gaila very rocky loam, 8 to 15 percent slopes
GbD	Gaila very rocky loam, 15 to 25 percent slopes
GcB	Gaila very bouldery loam, 0 to 8 percent slopes
GcC	Gaila very bouldery loam, 8 to 15 percent slopes
GcD	Gaila very bouldery loam, 15 to 25 percent slopes
GdB	Gaila very rocky loam, 0 to 8 percent slopes
GdC	Gaila very rocky loam, 8 to 15 percent slopes
GdD	Gaila very rocky loam, 15 to 25 percent slopes
GeB	Gaila very bouldery loam, 0 to 8 percent slopes
GeC	Gaila very bouldery loam, 8 to 15 percent slopes
GeD	Gaila very bouldery loam, 15 to 25 percent slopes
GfB	Gaila very rocky loam, 0 to 8 percent slopes
GfC	Gaila very rocky loam, 8 to 15 percent slopes
GfD	Gaila very rocky loam, 15 to 25 percent slopes
GgB	Gaila very bouldery loam, 0 to 8 percent slopes
GgC	Gaila very bouldery loam, 8 to 15 percent slopes
GgD	Gaila very bouldery loam, 15 to 25 percent slopes
GhB	Gaila very rocky loam, 0 to 8 percent slopes
GhC	Gaila very rocky loam, 8 to 15 percent slopes
GhD	Gaila very rocky loam, 15 to 25 percent slopes
GkB	Gaila very bouldery loam, 0 to 8 percent slopes
GkC	Gaila very bouldery loam, 8 to 15 percent slopes
GkD	Gaila very bouldery loam, 15 to 25 percent slopes
GmB	Gaila very rocky loam, 0 to 8 percent slopes
GmC	Gaila very rocky loam, 8 to 15 percent slopes
GmD	Gaila very rocky loam, 15 to 25 percent slopes
GnB	Gaila very bouldery loam, 0 to 8 percent slopes
GnC	Gaila very bouldery loam, 8 to 15 percent slopes
GnD	Gaila very bouldery loam, 15 to 25 percent slopes
GoB	Gaila very rocky loam, 0 to 8 percent slopes
GoC	Gaila very rocky loam, 8 to 15 percent slopes
GoD	Gaila very rocky loam, 15 to 25 percent slopes
GpB	Gaila very bouldery loam, 0 to 8 percent slopes
GpC	Gaila very bouldery loam, 8 to 15 percent slopes
GpD	Gaila very bouldery loam, 15 to 25 percent slopes
GrB	Gaila very rocky loam, 0 to 8 percent slopes
GrC	Gaila very rocky loam, 8 to 15 percent slopes
GrD	Gaila very rocky loam, 15 to 25 percent slopes
GsB	Gaila very bouldery loam, 0 to 8 percent slopes
GsC	Gaila very bouldery loam, 8 to 15 percent slopes
GsD	Gaila very bouldery loam, 15 to 25 percent slopes
GtB	Gaila very rocky loam, 0 to 8 percent slopes
GtC	Gaila very rocky loam, 8 to 15 percent slopes
GtD	Gaila very rocky loam, 15 to 25 percent slopes
GuB	Gaila very bouldery loam, 0 to 8 percent slopes
GuC	Gaila very bouldery loam, 8 to 15 percent slopes
GuD	Gaila very bouldery loam, 15 to 25 percent slopes
GvB	Gaila very rocky loam, 0 to 8 percent slopes
GvC	Gaila very rocky loam, 8 to 15 percent slopes
GvD	Gaila very rocky loam, 15 to 25 percent slopes
GwB	Gaila very bouldery loam, 0 to 8 percent slopes
GwC	Gaila very bouldery loam, 8 to 15 percent slopes
GwD	Gaila very bouldery loam, 15 to 25 percent slopes
GxB	Gaila very rocky loam, 0 to 8 percent slopes
GxC	Gaila very rocky loam, 8 to 15 percent slopes
GxD	Gaila very rocky loam, 15 to 25 percent slopes
GyB	Gaila very bouldery loam, 0 to 8 percent slopes
GyC	Gaila very bouldery loam, 8 to 15 percent slopes
GyD	Gaila very bouldery loam, 15 to 25 percent slopes
GzB	Gaila very rocky loam, 0 to 8 percent slopes
GzC	Gaila very rocky loam, 8 to 15 percent slopes
GzD	Gaila very rocky loam, 15 to 25 percent slopes
HaB	Hasbrouck very stony loam, 0 to 8 percent slopes
HaC	Hasbrouck very stony loam, 8 to 15 percent slopes
HaD	Hasbrouck very stony loam, 15 to 25 percent slopes
HbB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HbC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HbD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HcB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HcC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HcD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HdB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HdC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HdD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HeB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HeC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HeD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HfB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HfC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HfD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HgB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HgC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HgD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HhB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HhC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HhD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HkB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HkC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HkD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HmB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HmC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HmD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HnB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HnC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HnD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HoB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HoC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HoD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HpB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HpC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HpD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HrB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HrC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HrD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HsB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HsC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HsD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HtB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HtC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HtD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HuB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HuC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HuD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HvB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HvC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HvD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HwB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HwC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HwD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HxB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HxC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HxD	Hasbrouck very rocky loam, 15 to 25 percent slopes
HyB	Hasbrouck very bouldery loam, 0 to 8 percent slopes
HyC	Hasbrouck very bouldery loam, 8 to 15 percent slopes
HyD	Hasbrouck very bouldery loam, 15 to 25 percent slopes
HzB	Hasbrouck very rocky loam, 0 to 8 percent slopes
HzC	Hasbrouck very rocky loam, 8 to 15 percent slopes
HzD	Hasbrouck very rocky loam, 15 to 25 percent slopes
IaB	Ithaca very stony loam, 0 to 8 percent slopes
IaC	Ithaca very stony loam, 8 to 15 percent slopes
IaD	Ithaca very stony loam, 15 to 25 percent slopes
IbB	Ithaca very rocky loam, 0 to 8 percent slopes
IbC	Ithaca very rocky loam, 8 to 15 percent slopes
IbD	Ithaca very rocky loam, 15 to 25 percent slopes
IcB	Ithaca very bouldery loam, 0 to 8 percent slopes
IcC	Ithaca very bouldery loam, 8 to 15 percent slopes
IcD	Ithaca very bouldery loam, 15 to 25 percent slopes
IdB	Ithaca very rocky loam, 0 to 8 percent slopes
IdC	Ithaca very rocky loam, 8 to 15 percent slopes
IdD	Ithaca very rocky loam, 15 to 25 percent slopes
IeB	Ithaca very bouldery loam, 0 to 8 percent slopes
IeC	Ithaca very bouldery loam, 8 to 15 percent slopes
IeD	Ithaca very bouldery loam, 15 to 25 percent slopes
IfB	Ithaca very rocky loam, 0 to 8 percent slopes
IfC	Ithaca very rocky loam, 8 to 15 percent slopes
IfD	Ithaca very rocky loam, 15 to 25 percent slopes
IgB	Ithaca very bouldery loam, 0 to 8 percent slopes
IgC	Ithaca very bouldery loam, 8 to 15 percent slopes
IgD	Ithaca very bouldery loam, 15 to 25 percent slopes
IhB	Ithaca very rocky loam, 0 to 8 percent slopes
IhC	Ithaca very rocky loam, 8 to 15 percent slopes
IhD	Ithaca very rocky loam, 15 to 25 percent slopes
IkB	Ithaca very bouldery loam, 0 to 8 percent slopes
IkC	Ithaca very bouldery loam, 8 to 15 percent slopes
IkD	Ithaca very bouldery loam, 15 to 25 percent slopes
ImB	Ithaca very rocky loam, 0 to 8 percent slopes
ImC	Ithaca very rocky loam, 8 to 15 percent slopes
ImD	Ithaca very rocky loam, 15 to 25 percent slopes
InB	Ithaca very bouldery loam, 0 to 8 percent slopes
InC	Ithaca very bouldery loam, 8 to 15 percent slopes
InD	Ithaca very bouldery loam, 15 to 25 percent slopes
IoB	Ithaca very rocky loam, 0 to 8 percent slopes
IoC	Ithaca very rocky loam, 8 to 15 percent slopes
IoD	Ithaca very rocky loam, 15 to 25 percent slopes
IpB	Ithaca very bouldery loam, 0 to 8 percent slopes
IpC	Ithaca very bouldery loam, 8 to 15 percent slopes
IpD	Ithaca very bouldery loam, 15 to 25 percent slopes
IrB	Ithaca very rocky loam, 0 to 8 percent slopes
IrC	Ithaca very rocky loam, 8 to 15 percent slopes
IrD	Ithaca very rocky loam, 15 to 25 percent slopes
IsB	Ithaca very bouldery loam, 0 to 8 percent slopes
IsC	Ithaca very bouldery loam, 8 to 15 percent slopes
IsD	Ithaca very bouldery loam, 15 to 25 percent slopes
ItB	Ithaca very rocky loam, 0 to 8 percent sl



KEY

MAJOR FLOODPLAINS

MAJOR WETLANDS

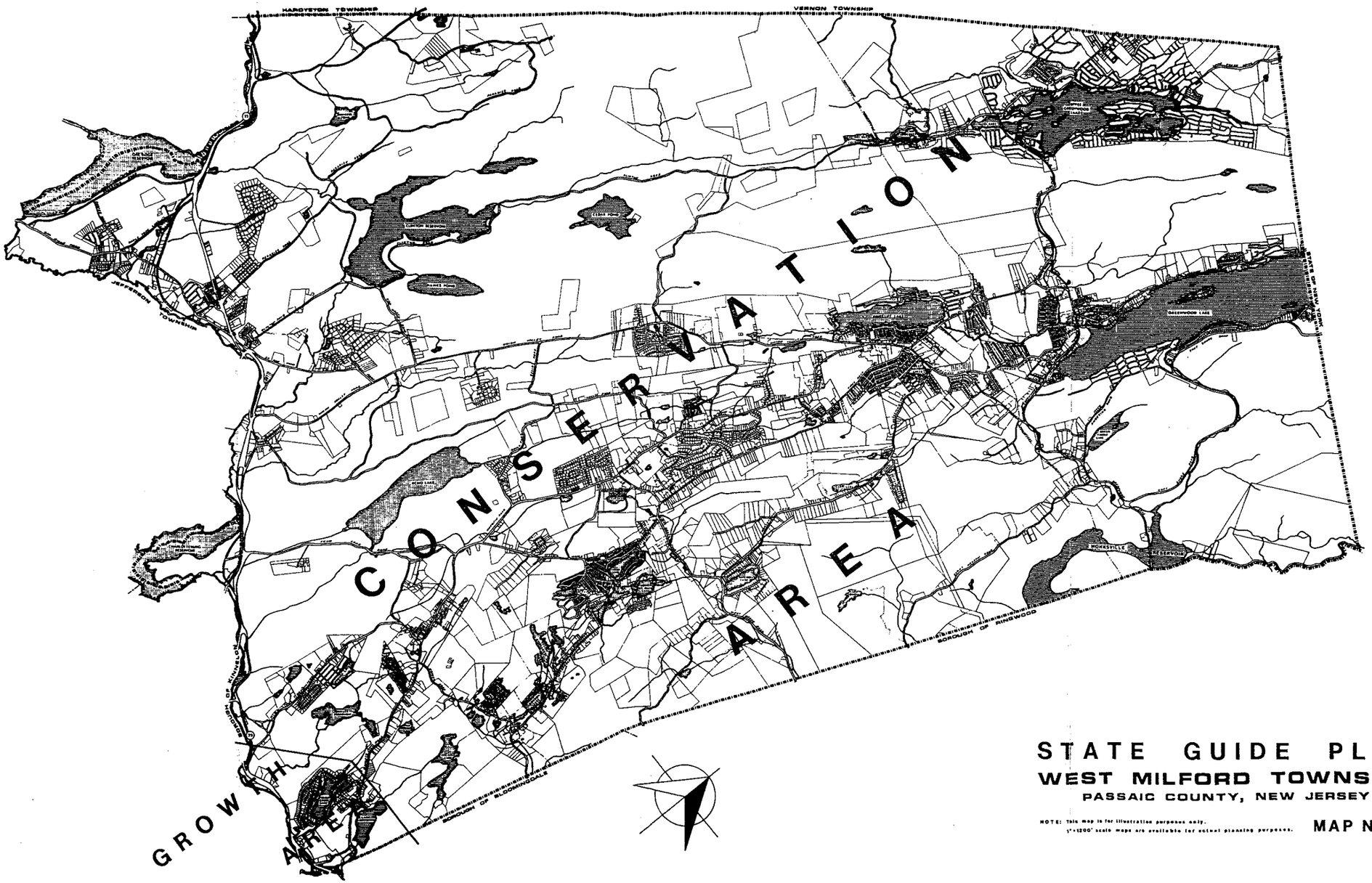
FLOODPLAINS, WETLANDS

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustration purposes only. 1"=1200' scale maps are available for actual planning purposes.

MAP NO. 6



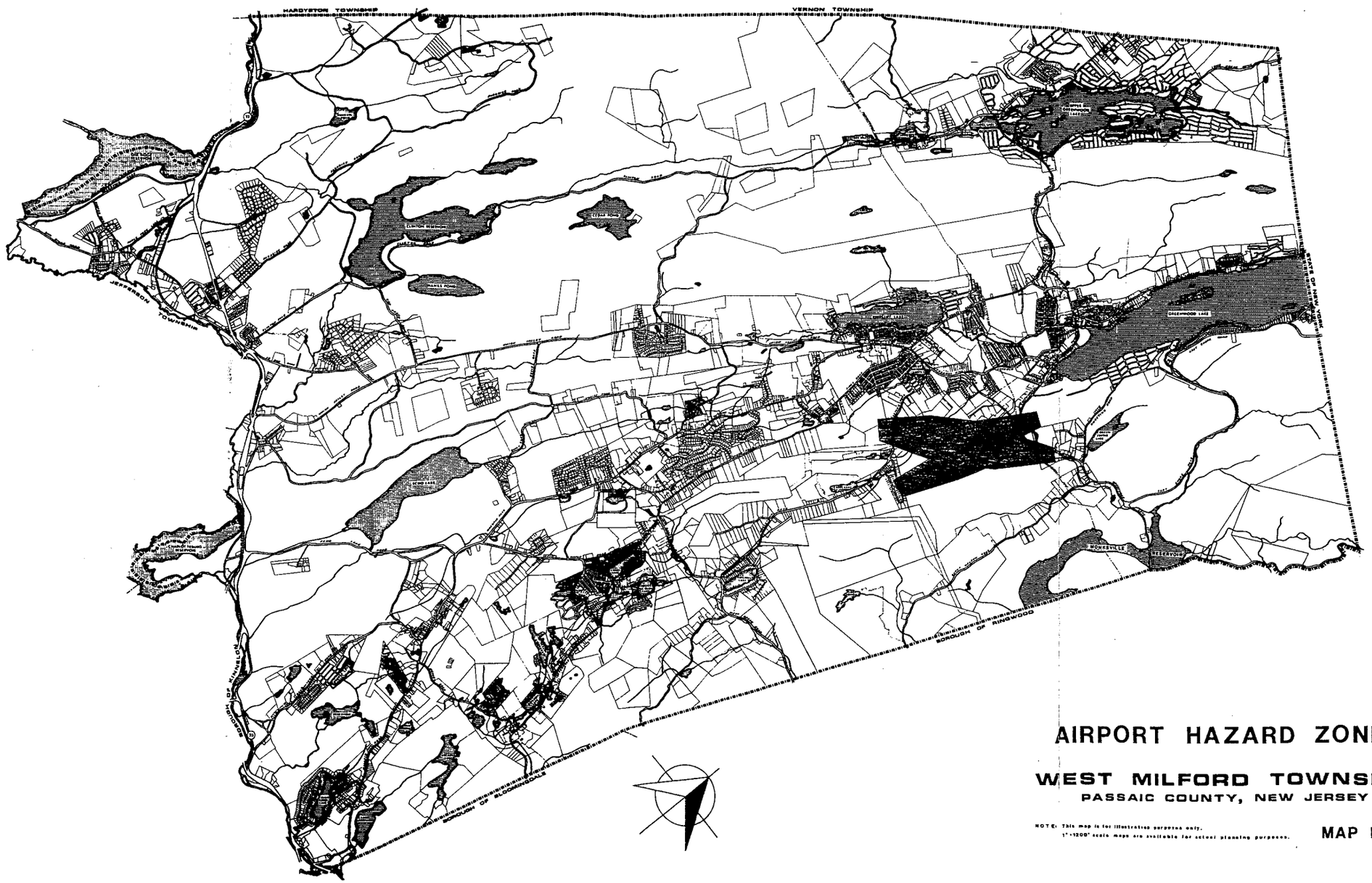
STATE GUIDE PLAN

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustrative purposes only.
1"=1200' scale maps are available for actual planning purposes.

MAP NO. 7



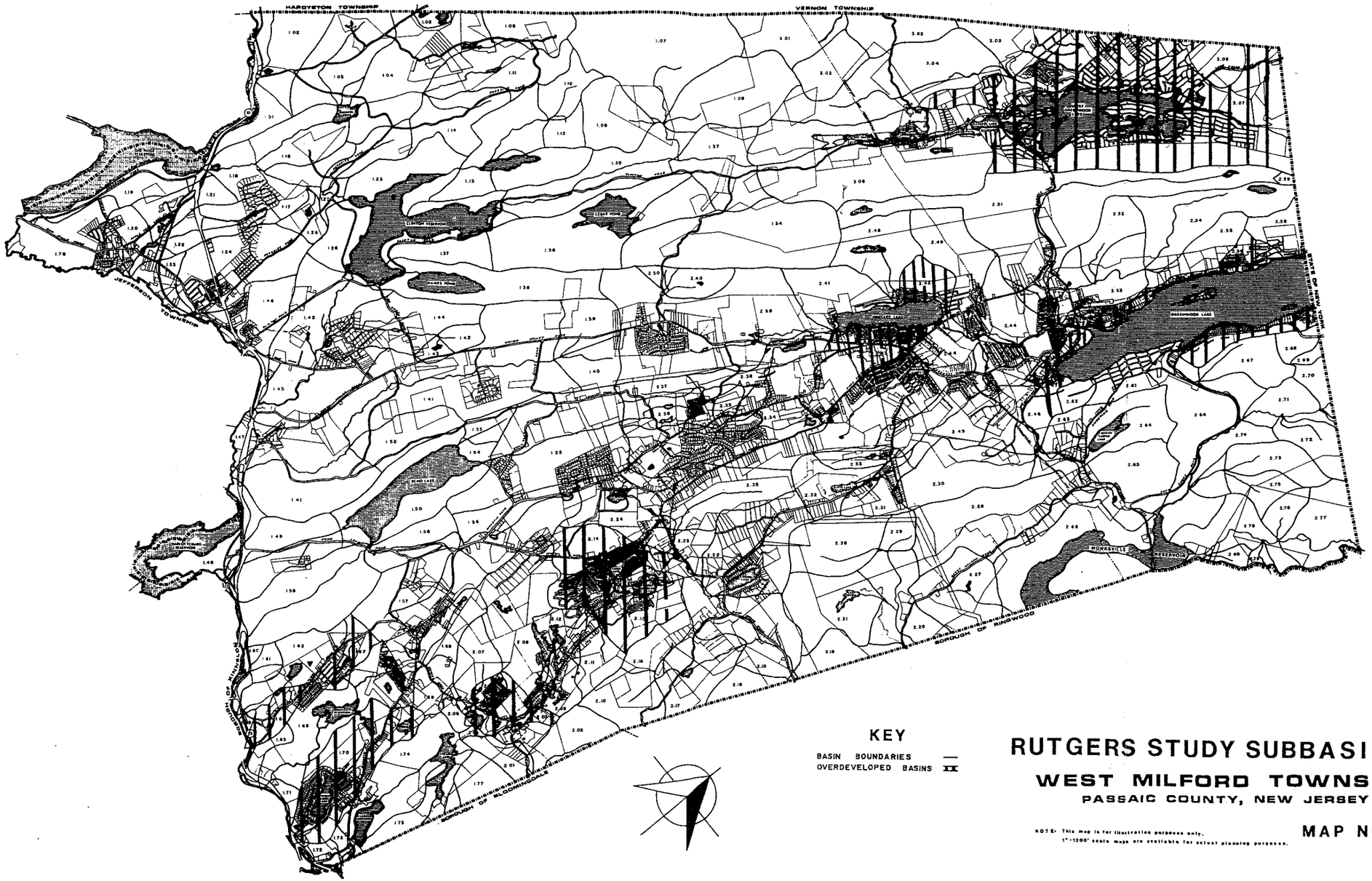
AIRPORT HAZARD ZONE

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustrative purposes only.
1"=1200' scale maps are available for actual planning purposes.

MAP NO. 8



KEY

BASIN BOUNDARIES —

OVERDEVELOPED BASINS ▥

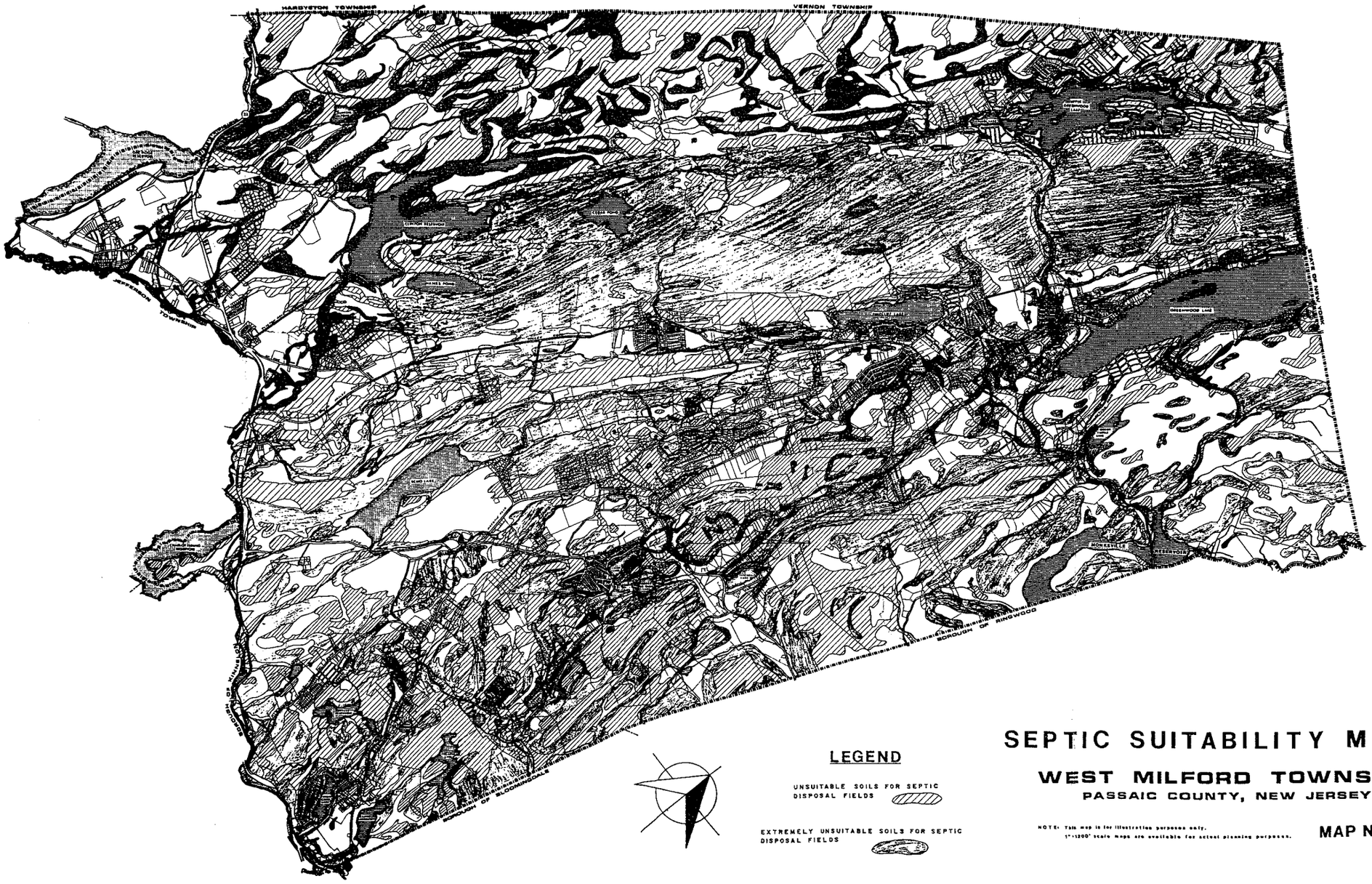
RUTGERS STUDY SUBBASINS

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustration purposes only. 1"=1200' scale maps are available for actual planning purposes.

MAP NO. 9



LEGEND

UNSUITABLE SOILS FOR SEPTIC DISPOSAL FIELDS

EXTREMELY UNSUITABLE SOILS FOR SEPTIC DISPOSAL FIELDS

SEPTIC SUITABILITY MAP

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

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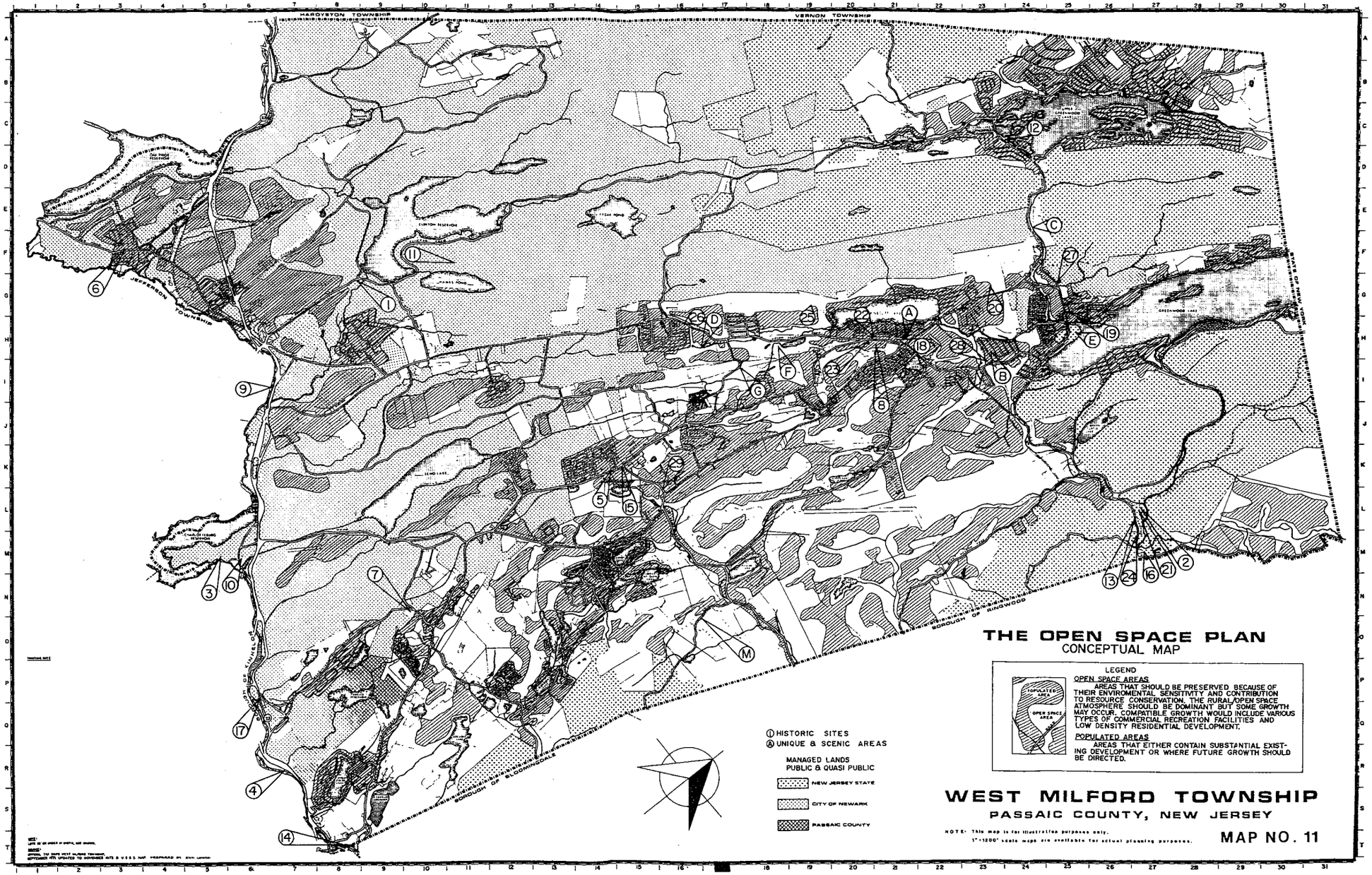
MAP NO. 10



THE OPEN SPACE PLAN
CONCEPTUAL MAP

LEGEND

OPEN SPACE AREAS
AREAS THAT SHOULD BE PRESERVED BECAUSE OF THEIR ENVIROMENTAL SENSITIVITY AND CONTRIBUTION TO RESOURCE CONSERVATION. THE RURAL/OPEN SPACE ATMOSPHERE SHOULD BE DOMINANT BUT SOME GROWTH MAY OCCUR. COMPATIBLE GROWTH WOULD INCLUDE VARIOUS TYPES OF COMMERCIAL RECREATION FACILITIES AND LOW DENSITY RESIDENTIAL DEVELOPMENT.

POPULATED AREAS
AREAS THAT EITHER CONTAIN SUBSTANTIAL EXISTING DEVELOPMENT OR WHERE FUTURE GROWTH SHOULD BE DIRECTED.

WEST MILFORD TOWNSHIP
PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustrative purposes only.
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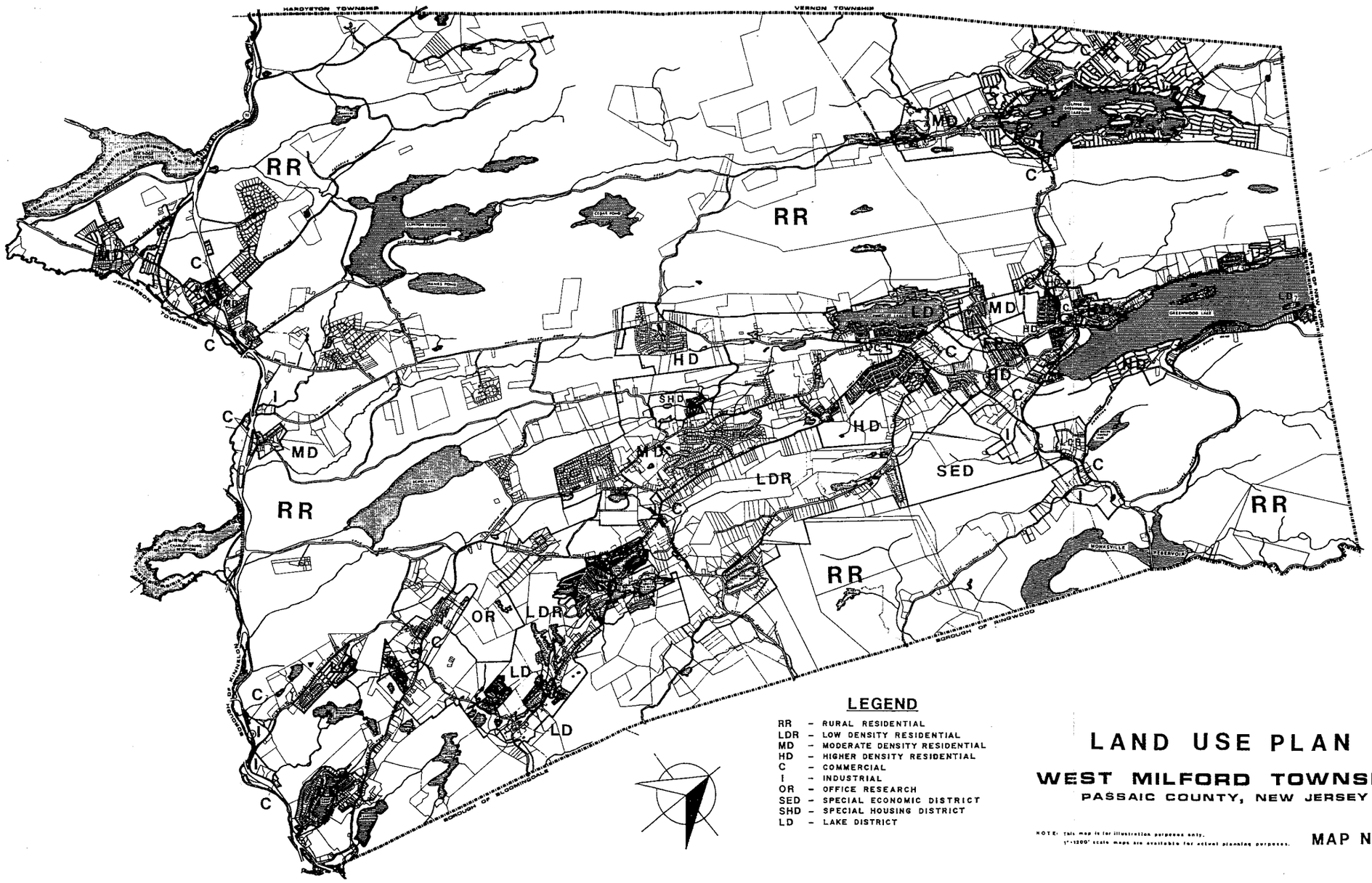
MAP NO. 11



LEGEND

RR	–	RURAL RESIDENTIAL
LDR	–	LOW DENSITY RESIDENTIAL
MD	–	MODERATE DENSITY RESIDENTIAL
HD	–	HIGHER DENSITY RESIDENTIAL
C	–	COMMERCIAL
I	–	INDUSTRIAL
OR	–	OFFICE RESEARCH
SED	–	SPECIAL ECONOMIC DISTRICT
SHD	–	SPECIAL HOUSING DISTRICT
LD	–	LAKE DISTRICT

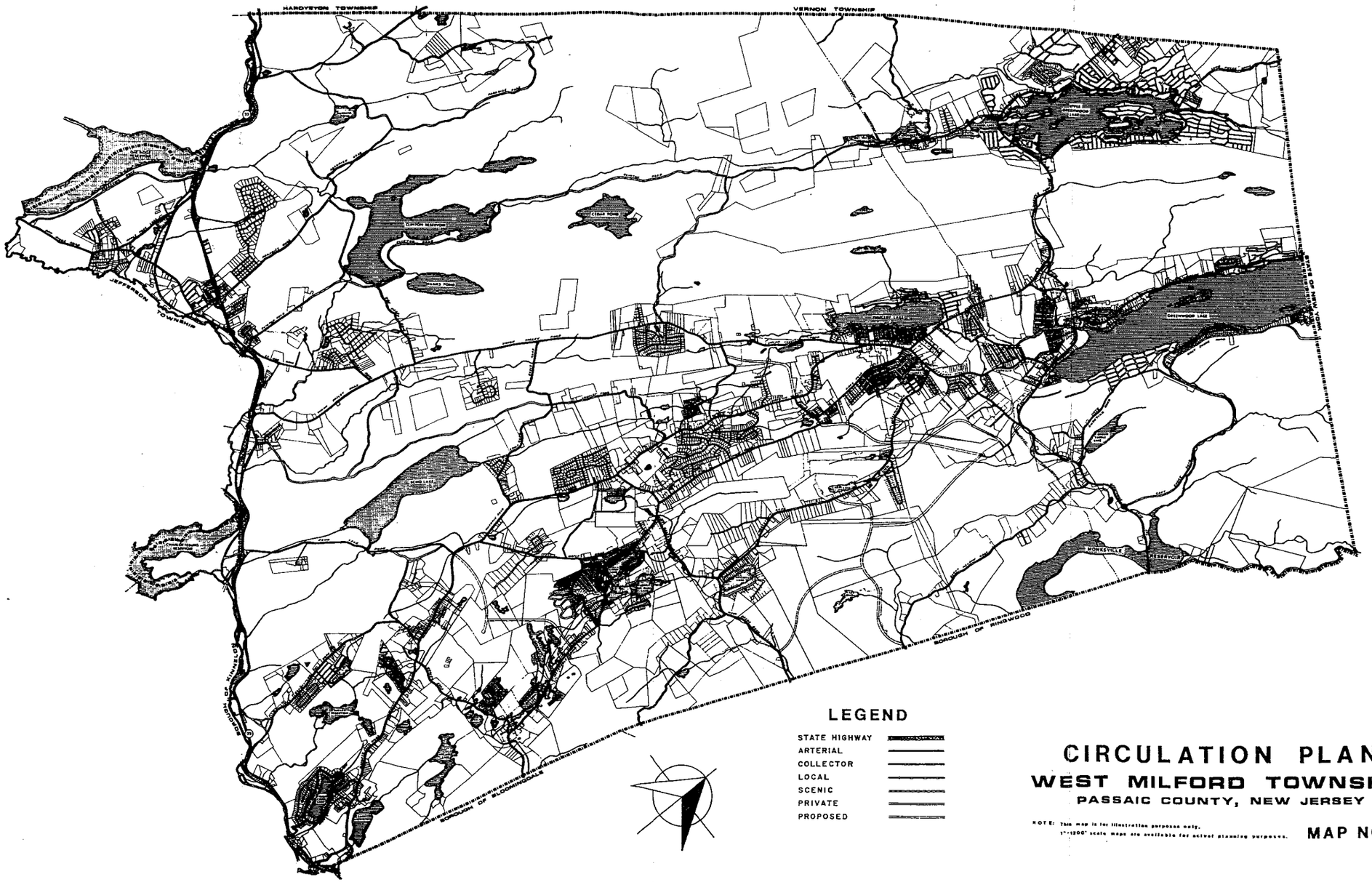
LAND USE PLAN

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustration purposes only.
1"=1200' scale maps are available for actual planning purposes.

MAP NO. 12



LEGEND

- STATE HIGHWAY
- ARTERIAL
- COLLECTOR
- LOCAL
- SCENIC
- PRIVATE
- PROPOSED

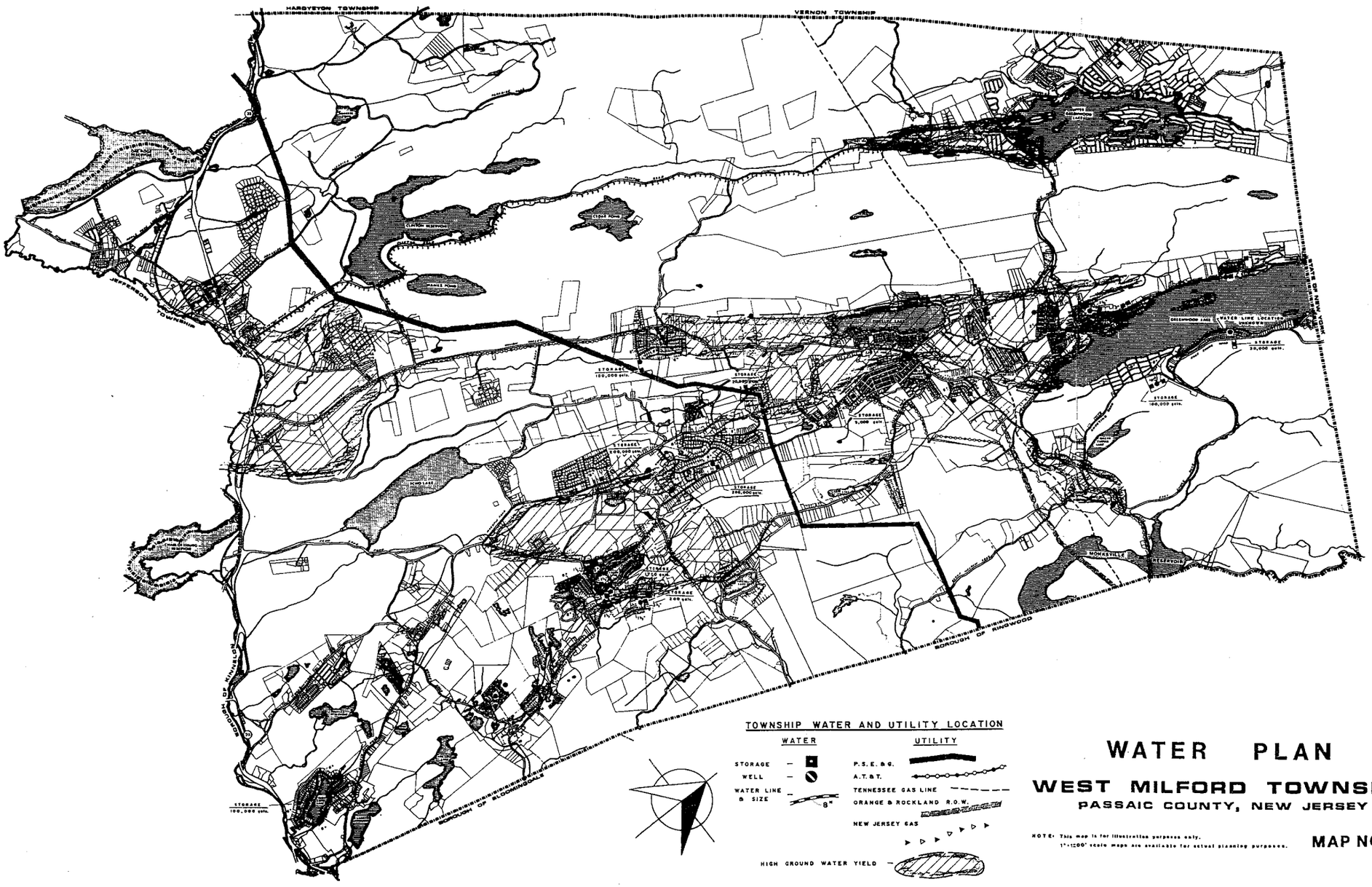
CIRCULATION PLAN

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustrative purposes only. 1"=1200' scale maps are available for actual planning purposes.

MAP NO. 13



TOWNSHIP WATER AND UTILITY LOCATION

WATER		UTILITY	
STORAGE		P.S.E. & G.	
WELL		A.T. & T.	
WATER LINE & SIZE	8"	TENNESSEE GAS LINE	
		ORANGE & ROCKLAND R.O.W.	
		NEW JERSEY GAS	
HIGH GROUND WATER YIELD			

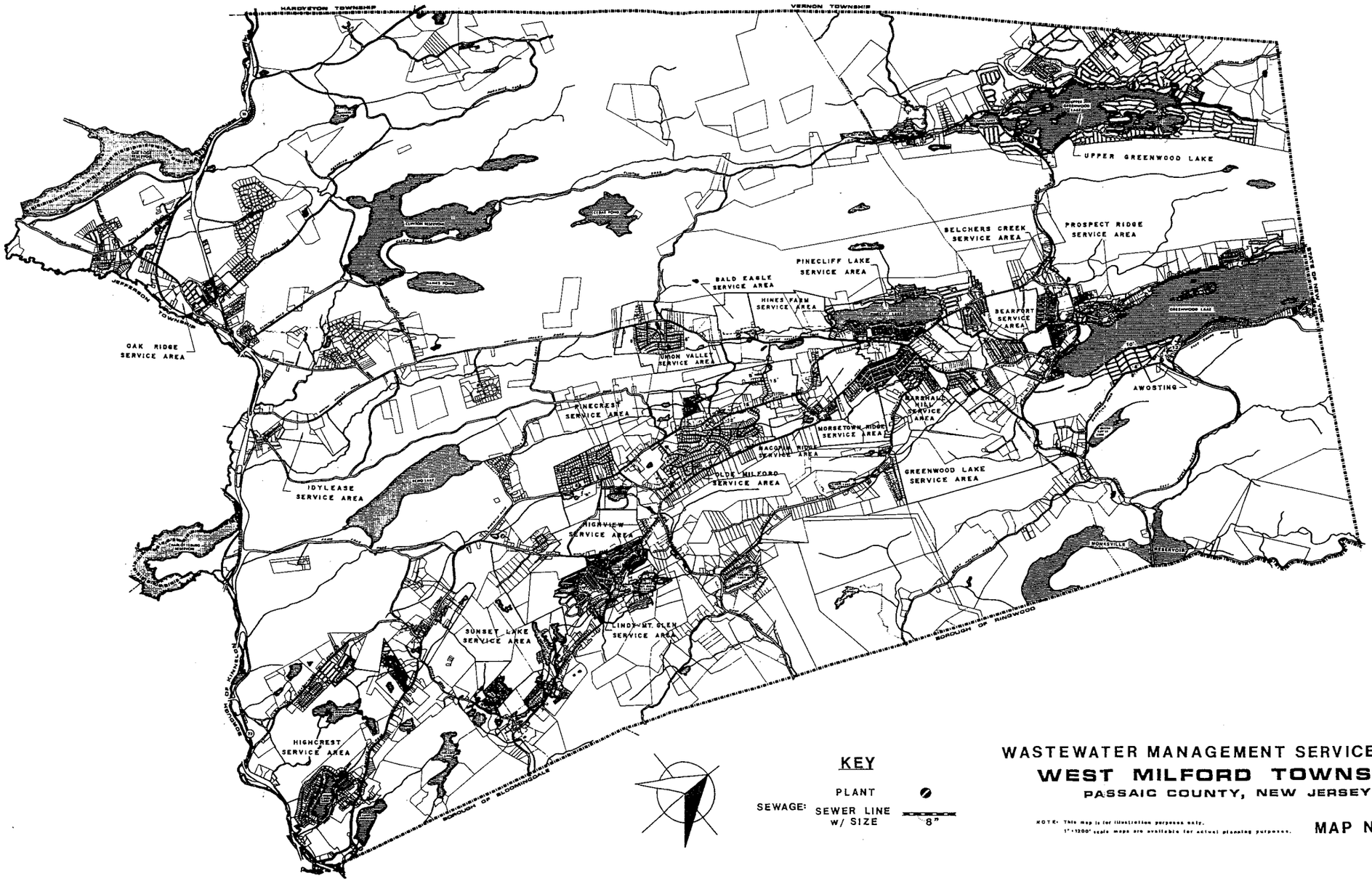
WATER PLAN

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustration purposes only. 1"=1200' scale maps are available for actual planning purposes.

MAP NO. 14



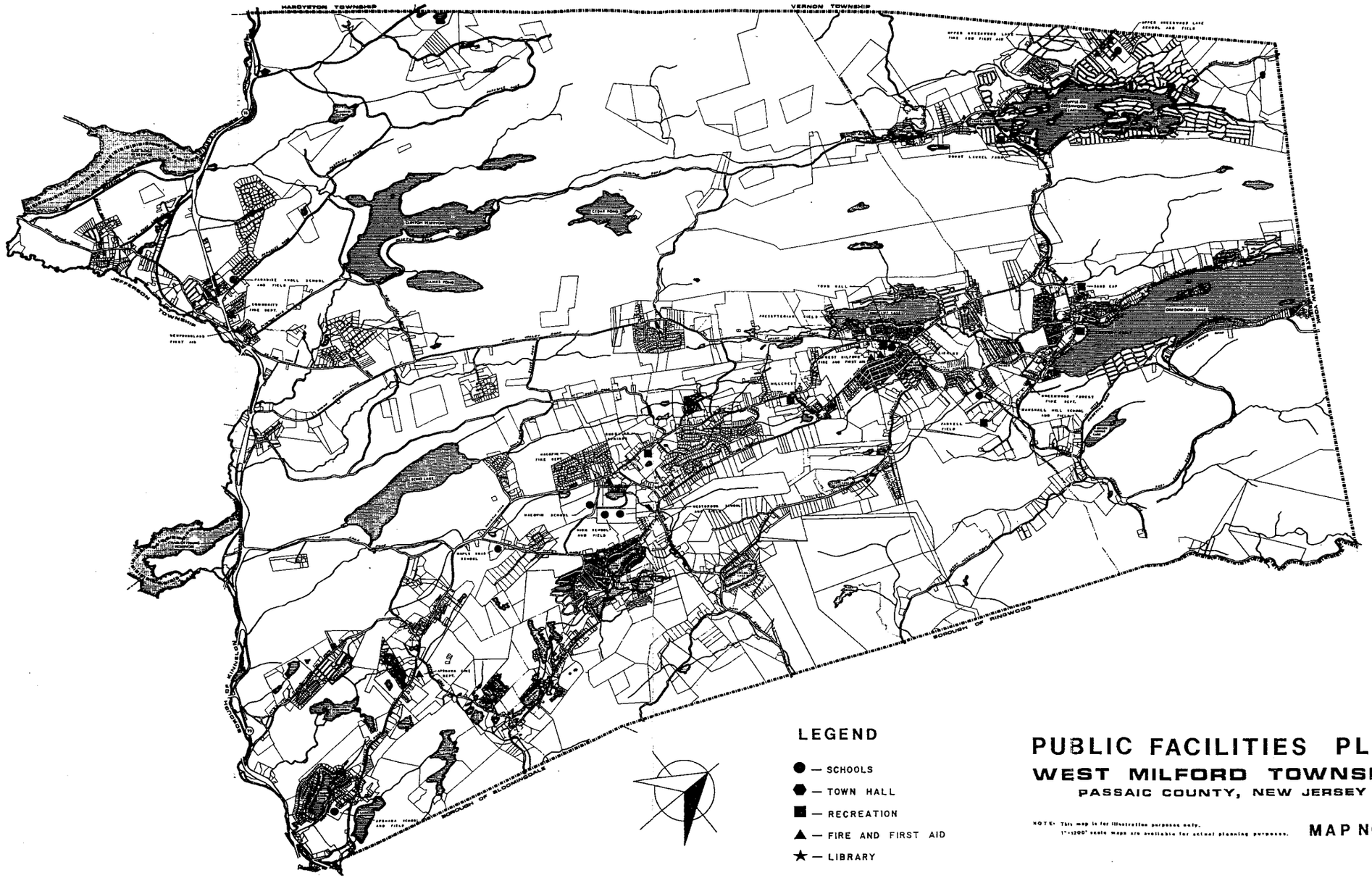
WASTEWATER MANAGEMENT SERVICE AREAS

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustration purposes only. 1"=1200' scale maps are available for actual planning purposes.

MAP NO. 15



PUBLIC FACILITIES PLAN

WEST MILFORD TOWNSHIP

PASSAIC COUNTY, NEW JERSEY

NOTE: This map is for illustrative purposes only. 1"=1000' scale maps are available for actual planning purposes.

MAP NO. 16