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**2001 Master Plan**

**Land Use Plan Element**  
**Conservation Plan Element**

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**Township of Lebanon**  
**Hunterdon County, New Jersey**

*Prepared by the Lebanon Township Planning Board  
in consultation with Banisch Associates, Inc.*

**Prepared August, 2001**

**Adopted: September 26, 2001**

**The original of this report was signed and sealed  
in accordance with N.J.A.C. 13:41-1.3**

# LEBANON TOWNSHIP MASTER PLAN

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# LEBANON TOWNSHIP

## 2001 Master Plan

### *Foreword*

Lebanon Township offers a great diversity of land and water resources. Bounded by two of the preeminent recreational rivers in New Jersey, the South Branch of the Raritan River and the Musconetcong River, and containing the highest elevation in Hunterdon County, the Township offers a mosaic of hills and valleys, forests and agricultural land. The Township's rugged terrain present an obstacle for development, but its desirable characteristics also provide an attraction for those seeking a rural, agricultural landscape. The dominant land uses in the Township remain forest and farmland, which imparts the rural character the Township seeks to protect.

Lebanon Township is a rural agricultural community where beautiful rolling hills provide long views and vistas, largely wooded or farmed, laced with streams and brooks and dotted with ponds. It is well suited to low intensity residential and farm use for those who prefer a rural agricultural lifestyle amid the beauties of nature. The slopes associated with the rolling terrain and the wetlands and heavy soils, which are a natural accompaniment of the streams and ponds, limit the suitability of much of the Township land for industrial or commercial use or high density residential development.

Two principal concerns have motivated past Township Committees and its Planning Boards. One has been the preservation of the rural agricultural countryside and the farms that are an essential part of its lifestyle. The second has been the careful management of development in environmentally sensitive areas. Accordingly, steep slopes and wetlands ordinances have been enacted and large lot zoning patterns have been designed to minimize the adverse impacts of high density development on land not suitable for it. Township officials have neither encouraged commerce and industry to settle in the Township nor developed an infrastructure of roads or public water and sewer facilities which would attract it.

Indeed, Lebanon Township was among the first Hunterdon County municipalities to limit the intensity of land use in response to environmental considerations. This Master Plan refines these regulatory limitations to better respond to the goals of environmental protection and agricultural retention. These local actions support the intent of the State Development and Redevelopment Plan and, when responsibly enacted by municipalities, obviate the need for home rule intervention by state boards or authorities.

A fundamental assumption of the Township's planning program has been that the Township's predominant 5 acre zoning, coupled with the difficult physical conditions in the Township, would protect the rural characteristics and environmental resources of the Township, and would serve to control major development. However, pressures on the

Township's land and water resources are becoming ever greater, leading to a need for more rigorous development controls. Changes in State and County policies concerning farmland and open space preservation make it apparent that more effective approaches to land management and preservation are needed.

As the supply of easily developable land in the Township dwindles, increasing pressure is being placed on more environmentally constrained areas and the remaining supply of agricultural land. The same attributes which the Township seeks to protect - its scenic quality, natural resources and agricultural lands - are those which attract new residential development. Thus, the Township has reexamined its planning policies and principles and developed more proactive methods, including regulatory and acquisition approaches, to retain farmland and protect the quality of the environment.

### ***Guiding Principles***

This Master Plan is dedicated to preserving, protecting and enhancing Lebanon Township's natural and cultural resources, and promoting a sustainable future for the Township and the region. The vision for addressing and managing change in Lebanon's future is reflected in these key principles:

*The essential character of Lebanon Township as a community of single family homes and small farms should be maintained.*

*Residential and agricultural zones should provide a restful environment secure from intrusion by uses not directly related to residential and agricultural pursuits.*

*Farming and agriculture should be encouraged and promoted.*

*Community character should be maintained through an orderly and controlled development pattern within the limits of available water supplies, the capacity for effluent disposal and the preservation of the Township's natural beauty.*

*Water quality and quantity should be protected for the current and future use and enjoyment of residents, downstream users and ecological receptors.*

*Design and performance standards should protect environmentally sensitive areas with the goal of improving the quality of the air and water that flow through Lebanon Township.*

*Future development should be managed to protect the rural character of the Township's countryside and road network, including its tree-shaded lanes, meandering streams and brooks, open fields and pastures, wooded areas, and rugged topography.*

*Commercial development should be limited to development nodes where services and facilities can be provided and maintained most economically. Industrial*

*development should be sharply restricted, as it produces negative effects on the residential and agricultural nature of the Township.*

The realization of these objectives will require a combination of public actions, such as farmland and open space preservation, and sustainable land use strategies and zoning techniques, as well as a variety of private conservation efforts.

### ***Introduction***

The preparation of this Master Plan was prompted by the 2000 Reexamination Report adopted by the Planning Board in August 2000. The Planning Board had also completed Reexamination Reports in 1988 and 1994. Following the recommendations of the 1988 Reexamination Report, the Planning Board adopted the 1991 Master Plan Review and Update, which updated the background data that forms the basis for the Master Plan. The 1991 Master Plan Review and Update also revised the objectives of the Township's prior Master Plans.

This 2001 Master Plan includes the statement of objectives, principles, assumptions, policies and standards upon which the subsequent proposals for the physical, economic and social development of the Township are based; the mandatory Land Use Plan Element, which a community is required to adopt in order to maintain the authority to zone; and, the Conservation Plan Element, which is intrinsically related to the proposals in the Land Use Plan Element. The Planning Board adopted the other required Master Plan element, the Housing Plan Element, in 1998.

The optional elements of the Master Plan will be prepared as part of a multi-year, continuing planning program. A Farmland Preservation Plan and an Open Space and Recreation Plan, which will provide the Township with tools to actively pursue acquisition and preservation efforts, assume a high priority in future planning efforts.

### ***Goals and Objectives***

Through the statement of objectives, principles, assumptions, policies and standards the Planning Board articulates the vision for the future development of the municipality. This vision builds upon what has come before, incorporates these conditions, and expresses what the Township wants to be in the future.

The purposes of the Municipal Land Use Law (MLUL) articulate the objectives of the State in providing municipalities with the power to plan and zone. These purposes of the enabling legislation combine with detailed local goals and objectives to guide the development of the Master Plan. The purposes of the Municipal Land Use Law (NJSA 40:55D-2) are as follows:

- a. To encourage municipal action to guide the appropriate use or development of all lands in this State, in a manner which will promote the public health, safety, morals, and general welfare;
- b. To secure safety from fire, flood, panic and other natural and manmade disasters;
- c. To provide adequate light, air and open space;
- d. To ensure that the development of individual municipalities does not conflict with the development and general welfare of neighboring municipalities, the county and the State as a whole;
- e. To promote the establishment of appropriate population densities and concentrations that will contribute to the well being of persons, neighborhoods, communities and regions and preservation of the environment;
- f. To encourage the appropriate and efficient expenditure of public funds by the coordination of public development with land use policies;
- g. To provide sufficient space in appropriate locations for a variety of agricultural, residential, recreational, commercial and industrial uses and open space, both public and private, according to their respective environmental requirements in order to meet the needs of all New Jersey citizens;
- h. To encourage the location and design of transportation routes which will promote the free flow of traffic while discouraging location of such facilities and routes which result in congestion or blight;
- i. To promote a desirable visual environment through creative development techniques and good civic design and arrangements;
- j. To promote the conservation of historic sites and districts, open space, energy resources and valuable natural resources in the State and to prevent urban sprawl and degradation of the environment through improper use of land;
- k. To encourage planned unit developments which incorporate the best features of design and relate the type, design and layout of residential, commercial, industrial and recreational development of the particular site;
- l. To encourage senior citizen community housing construction;
- m. To encourage coordination of the various public and private procedures and activities shaping land development with a view of lessening the cost of such development and to the more efficient use of land;
- n. To promote utilization of renewable energy sources; and

- o. To promote the maximum practicable recovery and recycling of recyclable materials from municipal solid waste through the use of planning practices designed to incorporate the State Recycling Plan goals and to complement municipal recycling programs.

It is interesting to note that over half of the purposes of the statute are directed at protecting the environment, retaining open space and preventing urban sprawl. The statute also seeks to provide a desirable visual environment.

In addition to the MLUL purposes, and the goals of rural conservation and resource protection outlined above in the Introduction, the objectives of the 1991 Master Plan have been refined and expanded in this Master Plan. The statement of objectives is the fundamental component that guides the Planning Board's development of policies, strategies and standards. These include:

### **Land Use and Management**

- To exercise stewardship over the lands and waters of Lebanon Township to ensure that these resources are available for the sustenance and enjoyment of present and future generations.
- To protect and maintain the prevailing rural character and unique sense of place of the Township, including diverse residential neighborhoods, historic settlement areas and scenic landscapes, which result from the natural topography, agricultural lands, woodlands and watercourses.
- To promote the goals and objectives of Lebanon Township through the incorporation of local policies and strategies that respond to the basic premises, intent and purposes of the State Development and Redevelopment Plan and the Hunterdon County Growth Management Plan.
- To provide a future land use pattern that preserves large contiguous areas of farmland and other open lands and serves the needs of the community for housing, community services and a safe and healthful environment.
- To continue and expand upon land use policies that promote controlled development at suitable locations and appropriate intensities by discouraging the extension of growth-inducing infrastructure into rural areas.
- To establish development densities and intensities at levels which do not exceed the current planning capacity of the natural environment and available infrastructure, based on the sensitivities and limitations of these systems.

- To offer flexibility in development techniques which recognize new approaches and technologies that are responsive to evolving demographic, economic and environmental needs.

### **Community Design**

- To develop standards to ensure good visual quality and design for all land use categories.
- To ensure that new development is visually and functionally compatible with the physical character of the Township.
- To provide for a proactive approach to physical design and community planning so that adjacent land uses function compatibly and harmoniously in terms of scale and location.
- To improve the visual and physical appearance of developed areas through the implementation of design standards for features such as signs and buffering and protect residential neighborhoods from encroachment by incompatible uses.
- To retain to the greatest extent practicable attractive vistas from public rights-of-way, including views of hills, valleys, ridgelines, woodlands, farmlands, hedge rows, stream corridors, flood plains and other natural areas.

### **Natural Resources**

- To protect environmental resources which contribute to the rural character of the Township, including but not limited to steep slopes, ridgelines, trout streams, wetlands, stream corridors, potable water supplies, watersheds, aquifers, rivers, viewsheds, forests and other vegetation, habitats of threatened and endangered species and unique natural systems.
- To limit the intensity of development, in areas relying on groundwater supplies and on-site sewage disposal, based on conservative estimates of available water resources and the ability of the soil and ground water to sustain on-lot disposal systems without degrading or impairing the water quality.
- To promote the protection of biological diversity through the maintenance of large contiguous tracts and corridors of recreation, forest, flood plain and other open space lands.
- To continue the acquisition of important open space through the use of the Township's open space tax and other sources of funding.
- To promote land use and management policies that provide for clean air and protection from noise and light impacts.

- To promote the development and adoption of resource management standards to manage land use activities in a manner that protects and maintains natural resources for the future use and enjoyment of generations to come.
- To identify and manage stream corridor buffer areas by maintaining undisturbed vegetation in order to protect and improve water quality, wildlife corridors and opportunities for passive and active recreation.
- To ensure that development involving steep slopes is required to meet design standards which enhance the attractiveness of the site.
- To refine the Township's tree protection ordinance so that the high quality forests of the Township, which contribute so much to the Township's environmental quality and scenic beauty, are preserved and maintained
- To protect groundwater supply and quality through the adoption of aquifer management programs, including relevant standards for wellhead protection programs, and standards to protect groundwater recharge areas, such as impervious coverage limitations.
- To protect the sensitive headwaters of the Musconetcong River and the South Branch of the Raritan River.
- To protect groundwater resources to meet the demands of the Township and as a resource to the region.

### **Housing**

- To promote and support the development and redevelopment of affordable housing intended to address the Township's fair share of the region's lower income housing.
- To provide a range of housing opportunities within the Township.
- To develop housing strategies to address the needs of various age groups, including housing for senior citizens.
- To provide for residential densities and lot sizes that do not exceed the capabilities and limitations of natural systems and available infrastructure.

### **Agriculture**

- To encourage the preservation of agriculture through proactive planning where there are suitable conditions for the continued operation and maintenance of agricultural uses.

- To preserve a large contiguous land base to assure that agriculture remains a viable, permanent land use.
- To coordinate agricultural preservation activities with the State Agriculture Development Committee (SADC), Hunterdon County Agricultural Development Board and other open space preservation activities in the Township.
- To continue to seek the expansion and preservation of Agricultural Development Areas.
- To recognize agriculture as a significant economic industry in the community and to encourage economic opportunities in this industry.
- To provide financial incentives, financing mechanisms and enhanced opportunities for agricultural businesses that assist in maintaining agriculture as a viable economic activity.
- To encourage compatibility between agricultural operations and neighboring non-agricultural development through the right-to-farm ordinance.

### **Transportation**

- To create a circulation plan sufficient to accommodate planned development, while retaining the unique and scenic features of the rural road network.
- To coordinate with other municipalities and governmental bodies for a regional approach to transportation that respects and enhances the character of the community.
- To establish transportation policies and programs that improve connections among housing, employment and commercial uses, including provisions for vehicular and pedestrian travel and bicycle paths.
- To control development in rural areas so that traffic will not exceed the capacity of the existing rural road network to provide safe, efficient and convenient traffic movements, based on rural road service standards designed to maintain the character of the community.
- To recognize that roadways are public lands that deserve aesthetic design consideration as well as efficient movement of vehicles, and to carefully plan entrances to the Township because they represent a visitor's first impression of the Township.
- To encourage transportation funding for maintenance of the existing transportation system, rather than encouraging the development of new systems in rural areas.

- To minimize the impacts of transportation systems on the environment, including air and noise pollution.

### **Economic Development**

- To provide for desirable non-residential development in appropriate areas of the Township that will complement the existing character of the community and aid in broadening the local tax base.
- To promote the redesign of existing commercial sites to provide a more efficient land use pattern through such approaches as reduced curb cuts, interconnecting driveways, improved pedestrian and bicycle linkages and enhanced landscaping.
- To provide for new commercial areas in compact forms in areas with utilities in order to concentrate businesses and provide a variety of services.
- To coordinate such items as architectural design, access, landscaping, adequate parking, lighting, signs and similar design features to produce visually and functionally compatible economic development.

### **Historic and Cultural Resources**

- To safeguard and conserve the heritage of the Township by preserving those resources that have historic, archaeological, social, cultural, economic and architectural significance, based on national, state and local importance and criteria.
- To discourage encroachment on historic structures and sites by uses and buildings that are incompatible or detract from the design of the historic features.
- To encourage the preservation, rehabilitation or adaptive reuse of historic buildings and structures that protects their architectural integrity and preserves their context within the historic landscape.
- To encourage the development of land use regulations which acknowledge and permit special treatment for historic landscapes, districts, sites, and structures including setbacks, buffers and other design criteria.

### **Community Facilities and Utilities**

- To plan for the expansion of necessary public services, such as utilities, community facilities and recreation, at a reasonable cost in response to the proposals in the land use plan element.
- To establish a system whereby necessary capital improvements can be programmed and planned in advance, and land can be reserved to meet the future needs for community facilities and open space.

- To provide facilities for community groups and cultural activities.
- To ensure that the development process acknowledges and addresses the impact on community facilities and utilities through the payment of the fair share of any off-tract improvements for community facilities to the extent permitted by law.
- To encourage the coordination of facilities between the Township and local School District so that the schools serve as multi-age facilities for the community.

### **Recreation and Open Space**

- To promote the provision of appropriate and balanced public open space and recreational facilities through public action and the development review process.
- To prepare and maintain a recreation and open space master plan to establish and enhance recreational lands and public open space; to establish linkages of public spaces through the use of greenways, greenbelts, waterways, paths and bikeways; and, to establish as the highest priority for public acquisition, areas of unique recreational, scenic or environmental value.
- To encourage the public acquisition of areas of exceptional recreational or scenic value, or environmental sensitivity, at all levels of government, with priority given to acquisition of land to meet present and future demand for active and passive recreation.
- To support State and County open space programs and ongoing acquisitions for their value to the goals of the community.
- To promote cultural activities that provide recreational opportunities for a broad spectrum of residents and guests.
- To assess and provide opportunities for active and passive recreation to meet the needs of all citizens.
- To devise appropriate strategies for the public and private ownership and maintenance of open space and recreation lands.
- To encourage the continuation and expansion of non-profit camps for their valuable contribution to the recreation and open space resources of the Township.

### **THE LAND USE PLAN**

This Land Use Plan Element has been designed to implement the foregoing goals, objectives, principles and assumptions in a manner which respects and responds to the capabilities and limitations of the natural conditions - groundwater quantity and quality,

surface water resources, agricultural use opportunities, soils, woodlands, wetlands and flood prone areas. The Plan generally depicts the proposed location, extent and intensity of development of land to be used in the future for varying types of residential, commercial and industrial purposes, as shown on the Land Use Plan Map. These land use planning proposals become effective agents for managing change when implemented through the zoning ordinance.

The Land Use Plan Element is the fundamental unit of the Master Plan, with the broadest scope and most far-reaching consequences. It represents a municipality's basic statement about the future disposition of land and the physical form of the community. Informed by the other plan elements, which play supporting roles, the Land Use Plan and the Conservation Plan have the greatest influence on the Township's future, as they shape local zoning.

This Plan maintains the policy orientation of prior Master Plans, but refines land use strategies to better address evolving conditions and concerns. It provides a more detailed description of the goals, objectives and intent of the Plan, and suggests new planning initiatives to achieve the Township's objectives. The recommendations of the 2000 Reexamination Report are also reflected in this Land Use Plan.

### **Residential Land Use**

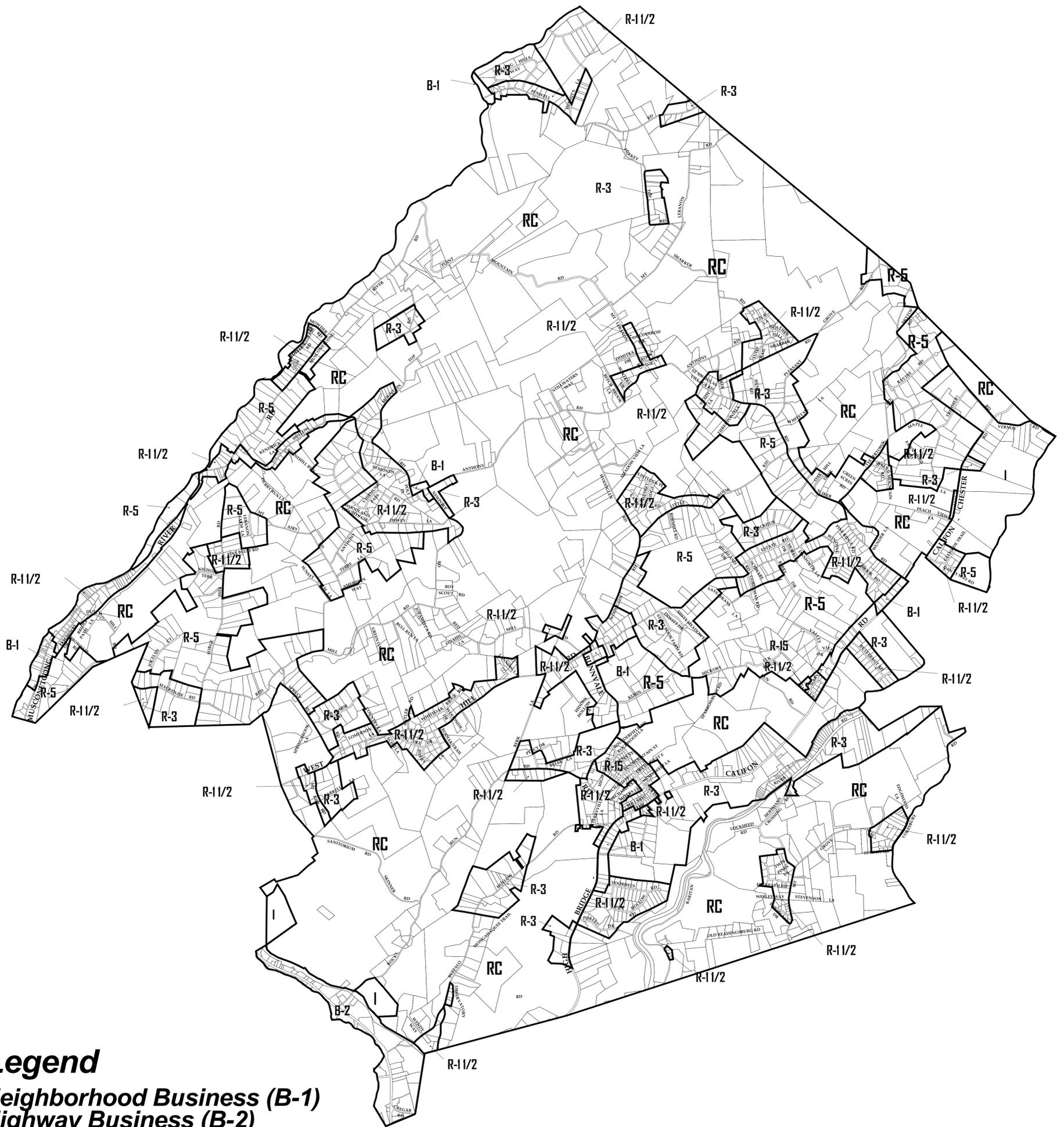
The residential lands in the Township traditionally have been divided into four districts, predominantly reflecting historical development patterns and existing lot sizes. These four districts cover a broad spectrum of lot sizes and environmental conditions, ranging from small-lot neighborhoods to expansive wooded and agricultural areas. This Land Use Plan proposes an additional residential district, as indicated on the Land Use Plan map and discussed below.

The Plan acknowledges that changes in land use classifications and densities will create nonconforming vacant lots. With regard to vacant lots in any residential zone throughout the Township, the Plan proposes the grandfathering of all vacant lots of 30,000 square feet or greater, so that each of these vacant lots has a residential development opportunity. The Plan also acknowledges that changes in land use classifications and minimum lot sizes will create nonconformities for developed lots that should receive appropriate treatment in the implementing ordinances, in order to provide reasonable opportunities for the modification and/or expansion of preexisting housing units.

### **Resource Conservation District**

The Resource Conservation (RC) District is intended to comprehensively address the goals of protecting groundwater quantity and quality, preserving surface water resources, conserving the scenic rural character and promoting continued agricultural use opportunities. The RC District embodies the rural and agricultural countryside that the Township's planning program has sought to maintain throughout its history.

# Land Use Plan Lebanon Township August 2001



## Legend

- Neighborhood Business (B-1)**
- Highway Business (B-2)**
- Industrial (I)**
- One-Family Residential (R-1 1/2)**
- One-Family Residential (R-15)**
- Rural Residential (R-3)**
- Rural Agricultural (R-5)**
- Resource Conservation (RC)**

Map Scale=1:20,000

1 0 1 Miles



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Hunterdon County Division of GIS

The lack of public water and sewer infrastructure throughout the District limits future development potential, which should be designed in response to the carrying capacity limitations of the natural systems. Capacity-based planning involves the measurement of a municipality's ability to accommodate growth and development within limits defined by natural resource capabilities and existing infrastructure. A capacity analysis determines the limiting factors in an area's ability to grow and evaluates the capacity of the limiting factor. With the absence of public water and sewer infrastructure the limiting factor thus becomes an element of the natural environment, such as water.

Sustainable development policies provide a land use framework that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development respects capacity limits and provides a margin of safety, and incorporates the goals of stewardship over land and water resources, and the prolonged maintenance of a desirable physical environment.

A dominant theme in the planning process has been the protection of water resources, with a particular emphasis on groundwater quantity and quality. Because of the singular importance of this resource, the Planning Board commissioned a study of the groundwater resources of the Township. This study analyzed the ability of the groundwater system to provide a sustainable yield of water, and the parameters which affect the quality of groundwater. The Township's groundwater resources are of value not only to the current and future residents of the Township, but also to downstream consumers and ecological receptors. As a recharge and headwaters area for one of the most populous and fastest growing regions in the State, the responsible course of action is for the Township to protect these resources through all available measures.

The Township is underlain by two distinct types of geologic formations. The characteristics of this bedrock geology dictate how well they function as aquifers, or groundwater systems. Approximately 90% of the Township is underlain by Precambrian igneous and metamorphic bedrock, consisting of gneiss and granite. This area is designated as the Precambrian Crystalline Rock area in the groundwater resources report. The remainder of the Township, lying along the Musconetcong River and the South Branch Raritan River near Califon, consists of Ordovician-Cambrian limestones and dolomites, or carbonate formations. These areas are designated the Limestone/Dolomite area in the groundwater resources report.

The characteristics of the Limestone/Dolomite area indicate that there is more available groundwater in this formation than in the Precambrian Crystalline Rock area, but the Limestone/Dolomite is susceptible to hazards such as sinkhole formation, subsidence and rapid transport of pollutants. The storage potential of the Limestone/Dolomite formation is enhanced by the presence of solution channels which provide spaces for groundwater storage, while the Precambrian Crystalline Rock formation is less porous with limited fracturing and limited available groundwater.

The groundwater management strategy represented by the RC District seeks to balance the goals of limiting the degradation of groundwater while also permitting appropriate

uses of land. The land and water management policies of this Plan do not attempt to achieve non-degradation of groundwater, which would essentially prevent further development in these areas. While a strong argument can be made that the Township's groundwater resources merit a non-degradation approach, this Plan seeks a balance between resource protection and reasonable development expectations. Thus, this Plan seeks to program development at densities which permit limited degradation while protecting the potability and availability of groundwater resources.

Additional support for the limited degradation policy that underlies the RC District is provided by the surface water resources of the Township. Approximately 20% of the Township drains to the Musconetcong River, a trout maintenance stream and valued recreational resource. The other 80% of the Township drains to the Spruce Run Reservoir and the South Branch of the Raritan River, a trout maintenance stream, which flows through the Ken Lockwood Gorge, one of New Jersey's premier trout streams. The South Branch of the Raritan River is also a vital water supply resource for much of central New Jersey, and is one of the fastest growing regional watersheds in New Jersey. The tributaries to these rivers are all headwaters, or places of origin for the surface water system. Headwaters are particularly vulnerable to degradation because of the limited available flow, and any degradation in headwaters is felt downstream throughout the surface water system. The headwaters flowing to the Musconetcong River are all trout production streams, New Jersey's highest surface water classification outside of public conservation lands, and the headwaters of the South Branch are classified as trout production or trout maintenance streams.

In addition to the protection of groundwater and surface water resources, the RC District responds to the goals of conserving significant elements of the rural and agricultural countryside. The scenic vistas, wooded hillsides, agricultural fields and historic settlement patterns create the rural character that pervades much of Lebanon Township. These are fragile resources, which are highly susceptible to degradation. Full development at previously permitted densities has consumed most of the countryside, with little consideration given to the conservation of important natural and cultural features. In this development pattern, permitted units have been situated in a somewhat geometric arrangement that fails to recognize the natural patterns of the landscape and tends to eliminate or mar scenic vistas and characteristics.

The Township's wooded hillsides are an especially valuable resource that help define the beauty of Lebanon Township and provide many important functions. Often associated with steep slopes and poor drainage conditions, the forests prevent erosion, permit recharge, protect water quality, improve air quality, provide habitat for threatened and endangered species, and preserve streams. With over 56% of the Township's land area in forests, and over 85% of the forest consisting of deciduous forest and forested wetlands, the Township's tree cover is a critical resource that must be maintained and improved.

The importance of the Township's forests is also reflected in the critical wildlife habitat they provide. The NJDEP has developed a ranking system that prioritizes critical areas, defined as forests, wetlands and grasslands, by habitat wildlife value. The ranking

system produces detailed wildlife and habitat maps that identify critical wildlife areas and critical habitat areas. The forests of Lebanon Township fall into the highest categories of critical priority areas, indicating the presence of and habitat for endangered, threatened and priority species. The maintenance of large, contiguous areas of forested lands is an effective method to increase biodiversity on an ecosystem basis.

Full development has also required dramatic alteration of rural roadways to accommodate traffic movements and increased carrying capacity. As this alteration occurs, roadside features (trees, hedgerows, stone rows, etc.) and alignments (narrow cartways and winding alignments) are frequently lost. The rural character undergoes a subtractive process, resulting in conversion to a more suburban appearance, along with the impacts associated with this form of development.

Similarly, suburban development has consumed substantial agricultural lands in the Township. Suburban development can result in land use conflicts with agriculture as new neighbors object to the noise, odor, and other impacts of agricultural land uses on residential neighborhoods. The RC District limits the extent of residential development so that farms have fewer potentially incompatible neighbors and more lands can be retained for agricultural use. Since agriculture is reliant on the availability of significant water resources, lower densities also mean that more water is available for agricultural needs. As agriculture becomes more intensive and entrepreneurial, smaller agricultural parcels can play a meaningful role in agricultural production, especially with the advantageous access to the regional highway network and markets for ease of distribution to densely populated areas.

The long-term utility and viability of this resource is enhanced if critical masses of agricultural lands and soils are maintained wherever they currently exist. Farmland assessed parcels still account for almost half of the Township's land area. While active agricultural operations occupy less than half the farmland assessed parcels, the combination of fields and wooded parcels provides the open lands that the Township seeks to maintain. Most of the prime farmlands and soils of statewide importance remain in agricultural use. The combination of prime soils, access to densely populated markets and the Township's regional location all combine to assure an agricultural future, so long as the farmland base can be preserved. The significant amount of farmland can make farming a permanent part of the local landscape and economy.

Many different programs are available, and have been used, to preserve, protect and maintain the Township's agricultural base. The Township's farmland preservation approach involves a range of preservation strategies with a number of options for the landowner. As recommended in the Reexamination Report, a farmland preservation plan, outlining a variety of mechanisms to preserve farmland, should be prepared. In addition to the acquisition and management strategies outlined in the farmland preservation plan, land use regulation can assist agriculture by preserving two vital physical resources, land and water. If residential and non-residential development consumes all of the available water, then agriculture will not have it available. Similarly, if development consumes all of the land, then the farmland base is lost forever.

The RC District corresponds to those areas in the Township with the lowest groundwater supply potential, the greatest concentrations of steep slopes, the most limiting soil characteristics, the highest quality surface water, the best agricultural soils and the most scenic vistas. Although the District includes scattered residential developments interspersed among the agricultural and wooded lands that dominate the Township, the extent of development has not dramatically altered the scenic character and desirable natural and cultural features.

To implement the objectives, policies and principles outlined in this Plan, and to protect the environmental characteristics of the community, the RC District permits residential development at a density of 0.1 unit per acre, the equivalent of one unit per 10 acres. While the permitted development can be arranged in a conventional subdivision on 10 acre lots, the Plan also suggests other development options that better address the goals of the Plan to retain significant land areas in an undeveloped state, and which permit increased densities in order to achieve the goals.

Open lands zoning is a development concept that seeks to promote the objectives of this Plan to protect the Township's critical resources. This concept requires most of a tract to remain open and available for farmland or other resource use, and defines minimum standards for soil quality and usable land for the open lands. The remaining land is then planned to accommodate the permitted residential development. The open lands zoning technique provides for the retention of 65 to 70% of the parcel for continuing agricultural or resource conservation use, and limits the areal extent of residential development to no more than 30 to 35% of the parcel, arranged on lots of 2 acres. In order to promote the use of this technique, it is recommended that a density of one unit per 7.5 acres be permitted when a conforming open lands subdivision is proposed. This technique dramatically reduces the sprawl typically resulting from conventional zoning, and a vehicle is provided for the permanent preservation and conservation of major portions of the natural and agricultural landscape while accommodating permitted development. The taxable status of all resulting lots is maintained, since all properties remain in private ownership, and private ownership eliminates questions about the long-term maintenance of public or homeowners' open space and any related municipal responsibilities. As with the clustering option discussed below, a minimum tract size of 30 acres is required for an open lands subdivision.

Two other development options, clustering and lot averaging, are also recommended for the RC District. Clustering, designed to provide useful tracts of open space as a byproduct of residential development, permits a reduction in the minimum lot size in return for permanent commitments of open space areas, with the open space dedicated to either a public body or homeowners' association. Clustering is permitted where at least 65% of the tract can be retained in open space, subject to a minimum lot size of 2 acres. As with open lands zoning, a density of one unit per 7.5 acres is permitted to promote the potential use of the cluster zoning technique. With clustering, open lands zoning and lot averaging, the applicant must also submit a conforming conventional subdivision plan to establish the number of lots that could be developed under a conventional subdivision.

Lot averaging, under which the reduction in the size of some lots is permitted provided that other lots exceed the minimum lot area requirements, is a recommended development option for tracts of 30 acres or less. It is further recommended that a density of one unit per 7.5 acres be permitted when a lot averaging subdivision is proposed. The lot averaging approach should require that a majority of the lots fall within a specified range of lot sizes, such as 2 to 5 acres, in order to create larger lots designed to meet specific conservation objectives. This form of lot averaging offers greater potential to conserve critical resources than some other forms of this development concept. The benefits of lot averaging over clustering include maintaining the taxable status of all resulting lots, since all properties remain in private ownership. In addition, private ownership also eliminates any questions about the long-term maintenance of public or homeowners' open space and any related municipal responsibilities. This technique should be permitted for any subdivision involving 30 acres or less.

In addition to the residential development options outlined above, the Resource Conservation District also permits the principal and conditional uses outlined under the R-5, Rural Agricultural District.

#### R-5 Rural Agricultural District

The R-5 District is designed to recognize those areas of the Township which have largely developed under the 5-acre zoning that has prevailed in the Township. These areas include the following: the Forge Hill Road area north of Glen Gardner, which has been the location of several major subdivisions; along Musconetcong River Road near Butler Park; near Symonds Lane in the north central part of the Township; between Woodglen and East Hill Roads east of Woodglen; along Hollow Brook Road near Teetertown; and, along Sliker Road from East Hill Road to St. Nicholas Village.

In order to promote the goals of the Plan relative to resource conservation, it is recommended that the R-5 District also permit open lands zoning and lot averaging as development options, at the prevailing density of one unit per 5 acres. Under the open lands zoning development option, approximately 50% of the tract can be retained for continuing agricultural or resource conservation use, with the remaining area accommodating the permitted residential development on 2 acre lots. With the lot averaging option, a majority of the proposed lots should fall within a specified range of smaller lot sizes, such as 2 to 3 acres, in order to create larger lots designed to meet specific conservation objectives. As with the standards for the RC District, the applicant must submit a conforming conventional subdivision plan to establish the maximum number of lots that could be developed.

The R-5 District also allows single family detached dwellings with minimum lot areas of 5 acres and farms as permitted uses in the District. Also permitted as conditional uses are animal farms, animal kennels, institutional and public uses, nursing homes, supplementary apartments and home occupations. This District, as well as the R-3 and

R-1 ½ Districts, also permits camps, private country clubs and private recreation facilities, and roadside farm stands as conditional uses.

### R-3 Rural Residential District

The R-3 Residential District is scattered through many parts of the Township, and takes several forms. The largest concentration of the R-3 District occurs along the High Bridge-Califon Road (Route 513) from Bunnvale to the outskirts of Califon. Other large concentrations occur along Sliker Road from Teetertown to Saint Nicholas Village, and along East Hill Road to the east of Woodglen. These locations recognize existing development patterns along some of the major collector roads in the Township. Other R-3 Districts, near Penwell, Bunnvale, the Borough of Hampton and along West Hill Road, serve as a transitional land use category between higher and lower density residential uses.

The R-3 District permits single family detached dwellings with minimum lot areas of 3 acres and farms as the principal permitted uses in the District. The permitted conditional uses include most of the conditional uses listed under the R-5 District, except that animal farms, animal kennels and nursing homes are not permitted.

### R-1 ½ Residential District

The R-1 ½ District is identified throughout many parts of the Township, and generally takes one of two forms. Each of the Township's historical settlement areas, including Woodglen, Bunnvale, New Hampton, Changewater, Penwell, and the Califon area, has some R-1 ½ District to identify the higher density development node. The R-1 ½ District also occurs linearly radiating from the development nodes along the surrounding country roads. This situation occurs along West Hill Road, Musconetcong River Road and Sliker Road. Older subdivisions are another form of the R-1 ½ District.

The R-1 ½ District permits single family detached dwellings with a minimum lot size of 1 ½ acres and farms as the principal permitted uses in the District. Permitted conditional uses are the same as those permitted in the R-3 District.

### R-15 Residential District

The R-15 Residential District is located in only two parts of the Township, on the north and east sides of the village of Bunnvale at the intersection of Bunnvale Road and Route 513, and along Route 513 east of Hickory Run Road. The Bunnvale area is one of two sections of the Township that have available a community water supply system, with the other section being one subdivision adjacent to Califon Borough.

The R-15 is completely developed with residential dwellings on lots with a minimum area of 15,000 square feet. The Land Use Plan proposes to retain this settlement area in its existing configuration and subject to existing standards.

## **Non-residential Land Use**

The non-residential districts in the Township are characterized by two types of development patterns, small commercial nodes near existing villages and hamlets, and linear development along the Township's two major thoroughfares, Route 31 and Route 513. For the most part the Township's non-residential districts, with the exception of the Route 513 industrial district, represent historic development patterns arranged in a linear fashion near older settlement areas. To preserve and protect the scenic, agricultural character of the countryside and residential neighborhoods, the Township has not encouraged large-scale industrial development, and encouraged commercial development in nodes, where services and facilities can be economically provided and maintained.

The Land Use Plan includes three non-residential districts, including six small-scale, neighborhood business districts, one highway commercial district and two industrial zones. This Plan also recommends some modifications of the existing non-residential districts to limit development in inappropriate areas. Due to the prominence of the non-residential districts along the major transit corridors in the Township, and the proximity of these districts to residential areas, attentive site design is important to protect the scenic amenities and residential character of the Township. Therefore, each of the non-residential districts should include screening, buffering and landscaping standards designed to promote attractive and compatible development.

### **Industrial (I) District**

The major Industrial (I) District is located on Route 513 at the eastern end of the Township adjacent to Washington and Tewksbury Townships. The district is partially developed with industrial, storage and office uses, but is largely in farm uses. A second Industrial District, the site of a former quarry, is located west of Mt. Kipp at the boundary with Glen Gardner, and a third Industrial District is located on Rocky Run Road east of the railroad. The primary non-residential uses permitted in the district include business, administrative, executive and professional offices; industrial and manufacturing uses; and, research laboratories. Permitted conditional uses include commercial roadside stands, institutional and public uses, and detached one-family dwellings. The permitted principal and conditional uses are not proposed for change in this Plan, but it is recommended that the minimum lot size for conditional residential uses in this district be increased.

The former Land Use Plan included one additional industrial district, consisting of one lot, located on Anthony Road at the end of Wood Glen Road. For a variety of reasons, including accessibility and proximity to residential areas, this Plan recommends the elimination of this isolated industrial district.

### **Highway Business (B-2) District**

The Highway Business (B-2) District is located in one part of the Township, along both sides of Route 31 in the Township's southwest corner. The district is bounded by the

Spruce Run to the west and the Conrail railroad line to the east. The corridor is primarily developed with a mix of commercial and residential uses, and includes public property owned by the State as part of the Spruce Run Reservoir. Existing lot sizes vary widely, from residential and commercial uses on lots of less than one acre to an undeveloped lot of 23 acres.

There are two defining characteristics of this corridor through the Township. Physically, the area is a narrow band constrained by the Spruce Run on one side and the Conrail line on the other. From a land use perspective, the lot pattern and mix of uses along the corridor reflect over a century of development when Route 31 was not the major artery it is today.

The area is largely developed, or the combination of lot size and environmental constraints precludes much additional development. Redevelopment opportunities are somewhat limited by the same factors, and the proximity of the Spruce Run, one of the major feeder streams to Spruce Run Reservoir, to the west side of the corridor heightens environmental concerns. The Township will continue its efforts to improve this district through careful planning of development and redevelopment opportunities.

#### Neighborhood Business (B-1) District

The Neighborhood Business (B-1) Districts are located in proximity to the Township's villages, hamlets and other small settlement areas. The largest and most developed of the commercial areas is located on Route 513 adjacent to the northwest side of Califon Borough. This area includes the major retail commercial uses, including a grocery store and small shopping centers, and is linked to the Califon commercial center on Route 513. The Bunnvale commercial area is also located on Route 513, and consists of several retail establishments, including a restaurant and motor vehicle-related uses. The other four neighborhood business districts, at New Hampton and Pennwell along Musconetcong River Road; at Woodglen, the municipal service center in the Township; and, Anthony Road at Newport Road, recognize existing long-standing uses.

The intent of these districts is to provide limited commercial activities in close proximity to neighborhoods and existing uses. Because these districts are interwoven with the surrounding residential and agricultural community, only limited expansion opportunities are afforded.

## Lebanon Township Conservation Plan Element

### *Introduction*

The Municipal Land Use Law (NJSA 40:55D-1 et seq.) authorizes municipalities to plan and zone to promote the general welfare. The 15 purposes of the MLUL (NJSA 40:55D-2) explain the State legislature's rationale for the statutory authorization for municipal land use planning and regulation. More than half of these purposes highlight the importance of conserving natural resources and a clean healthy environment. The public health and safety (subsection "a") bear a direct relationship to the use and management of New Jersey's land and water resources. Securing safety from floods and other natural and manmade disasters (subsection "b") and providing adequate light, air and open space (subsection "c") are similarly directed at conserving natural resources. "Preservation of the environment", in part through planning for "appropriate population densities and concentrations" (subsection "e"), is a key underpinning of local land use policy.

"Providing sufficient space in appropriate locations" for a variety of land uses, "according to their respective environmental requirements", is intended "to meet the needs of all New Jersey citizens" (subsection "g") for a healthy environment. The statute also seeks to promote the conservation of "open space, energy resources and valuable natural resources in the State and to prevent urban sprawl and degradation of the environment through improper use of land" (subsection "j"). The conservation of energy is cited in subsection "n" ("promote utilization of renewable energy sources") and subsection "o" ("promote the maximum practicable recovery and recycling of recyclable materials").

Preventing urban sprawl has long been an objective of New Jersey's planning and zoning law, which is supported by the related objectives of protecting the natural environment and preventing its degradation.

In furtherance of these conservation objectives, the MLUL provides for preparation and adoption of a Conservation Plan Element (NJSA 40:55D-28b.8.) which reads as follows:

"Conservation plan element, providing for the preservation, conservation and utilization of natural resources, including, to the extent appropriate, energy, open space, water supply, forests, soil, marshes, wetlands, harbors, rivers and other waters, fisheries, endangered or threatened species, wildlife and other resources, and which systematically analyzes the impact of each other component and element of the Master Plan on the present and future preservation, conservation and utilization of those resources;"

This Conservation Plan outlines Lebanon Township's strategies to meet the statutory mandate to protect the environment. While it is designed to function in concert with the other plan elements, the most important linkage will be between the Land Use Plan and the Conservation Plan. Together, these plan elements propose the location, scale and

intensity of new development and the resource management strategies needed to protect the environment.

This Master Plan recognizes that “business as usual” will not meet the conservation objectives of the MLUL. Retaining suburban residential zoning and other high intensity zoning options will overtax the natural environment, with substantial degradation of surface water and groundwater quality. It will also entail the removal of substantial forested areas, which are in short supply, and farmlands, which are particularly vulnerable to suburban sprawl. The principles of sustainable development demand that resource commitments made during this generation will be sustainable—that is, able to be continued for the benefit of future generations.

The most effective way to protect farmland and natural resource lands is to buy the land or the development rights. This approach permanently preserves these valuable features, and is most effective at limiting the effects of development. The continuing New Jersey voter commitment to open space preservation, most recently evidenced in the approval of the \$1 billion Garden State Preservation Trust, bodes well for such acquisitions. However, hundreds of thousands of acres of undeveloped and “underdeveloped” land will remain beyond the reach of publicly funded acquisitions. Thus, local land use regulations continue to play a controlling role in how the environment is managed, during and after development. Air, water and soil are the essential resources which support a healthy biota.

Fragmentation and degradation of vegetation, land and water resources has been a byproduct of human activity. Woodlands, initially cleared for agricultural use, have given way to residential neighborhoods easily developed on these high, dry and usable soils. Water quality has been progressively altered and impacted by human activity. The quality of the air we breathe and the water we drink determines the health of the human organism and all life forms. This Conservation Plan seeks to minimize further degradation of these resources and establish an arsenal of environmental health-building tools for the 21<sup>st</sup> century and beyond. This calls for a systems approach to natural resource conservation, where interconnected natural systems are viewed as a collective resource, not a series of separate features.

The variety of biological species is an indicator of the health of an ecosystem. Maintaining biological diversity requires protection of critical habitat areas. While habitats of endangered or threatened plant or animal species are of special importance, threatened or endangered status may be transient. For instance, the great blue heron and bald eagle have been removed from the protected list, yet their critical habitats remain essential to their continued survival. Additionally, the extirpation of rare species removes elements from the food chain that help maintain ecological balance. The explosive deer population in New Jersey is but one example of the damage that can be wrought when this natural balance is lost.

Protecting biodiversity requires the protection of terrestrial and aquatic habitats that are highly susceptible to degradation. Pristine waters cannot be maintained without

protection of their watershed areas. Freshwater wetlands play an important role in filtering contaminants from the surface water and groundwater regime and, while protected by state statutes, are not immune from impacts that occur beyond the regulated areas. Similarly, prime forested areas, including mature stands of native species, are easily lost or damaged through fragmentation, a manmade impact that reduces biodiversity.

The scenic wonder of ridgelines, slopes and ravines is only one aspect of the value of these natural features, without which certain species will not remain. Similarly, grassland habitats are essential to the nesting, feeding and breeding of a variety of grassland bird species, yet such areas are frequently lost to development. The effects of agriculture and suburban development have isolated woodland segments, and eliminated or prevented the interconnection of the remaining woodlands. The background studies identify woodland areas by forest cover type, as well as critical wetland, water and grassland habitats. Land development should be arranged to maximize the conservation of substantial masses of critical habitat areas, by limiting the aerial extent of development and promoting conservation techniques targeted to these resources.

Carrying capacity is a planning technique used to establish the maximum population level of a species based on the availability of natural resources. Carrying capacity had its genesis in ecological studies, used to manage wildlife habitat rangeland for grazing. In the context of land use planning, carrying capacity has been defined as the ability of natural and man-made systems to support a level of population growth and ancillary development while maintaining established standards of performance. When applied to regulating land use, an assessment of carrying capacity is useful in establishing maximum densities or intensities of development. However, sustainability requires that we provide a margin of safety, and not plan for the maximum development that can currently be supported.

The policies and strategies of this Conservation Plan seek to limit the impacts of development and retain the natural terrain and features to the greatest extent practicable. This plan also promotes the restoration of natural systems that have been degraded by past activities. As new regulatory tools or techniques become available, they should be evaluated for their ability to promote the Conservation Plan objectives and adopted where appropriate. Additionally, open space acquisition priorities should be established to address the goals of the Conservation Plan.

### **Energy and Air Quality**

Protection of the Township's air quality is largely dependent on regional, state, national, and even international factors. Similarly, energy conservation and utilization is shaped by a host of factors. However, local land use regulations determine future land use patterns, which have a direct effect on air quality and energy use. Management approaches that the Township can initiate to mitigate air pollution and promote energy conservation include the following:

- a. Promote alternative means of transit by providing opportunities and access for alternative transportation systems (buses, car and van pooling, bicycling, and walking).
- b. Adopt development regulations that provide for residential neighborhoods and retain existing wooded areas and large contiguous open land areas.
- c. Reduce the need for vehicular trips by facilitating better interconnections among residential, commercial, office, and recreational uses.
- d. Encourage energy conservation through subdivision design, building design, building orientation, and the evaluation of microclimate conditions such as solar access and wind direction.
- e. Recommend landscaping standards that provide buildings with maximum solar access, shading, and wind protection.
- f. Encourage the maximum recovery of recyclable materials and the use of renewable energy sources.
- g. Design bikeways, pedestrian walkways and other routes to maximize opportunities for non-motorized travel in existing and new development.

### **Forest Resources and Native Vegetation**

Woodlands and other native vegetation perform a series of important functions related to the ecological balance. Forests produce oxygen, giving them intrinsic value. They reduce soil erosion and surface runoff and promote aquifer recharge, because of the high moisture holding capacity of the forest soils and tree canopy. Forests provide habitats for plant and animals and provide open space and recreation lands. They enhance the visual character of scenic corridors, create a feeling of privacy and seclusion and reduce noise impacts. And they affect local climatic conditions near or within their boundaries, such as the cooling effect on trout streams. Woodlands and other native vegetation also provide visual diversity in the terrain, enhancing the value of property. Removal of trees and other vegetation can result in ecological, hydrological, and economic impacts.

The following approaches are recommended to preserve, protect and improve the forest resources in the Township.

- a. A woodland conservation program, including identification of the floodplain, mesic and upland forest stands on the tract should be required as part of any application for development.
- b. Performance standards should be established limiting the extent of forest removal, based on the quality of the forest type. Priority wooded areas for preservation include unique forest types, woodlands adjacent to public water supply tributaries,

habitats critical for endangered and threatened species, 100-year floodplains, wetlands, stream corridors, and slopes of 15% or greater.

- c. Performance standards should encourage the preservation of habitat areas that are as large and circular as possible, gradual and undulating at the edges and connected by wildlife corridors wide enough to maintain interior conditions (i.e. 300' or more). Development activities in forested areas should minimize disturbance to important woodlands.
- d. Hedgerows and forest areas along traveled roadways and established property boundaries should be retained and enhanced, where appropriate.
- e. Woodland areas along open space corridors should be preserved and interconnections among existing woodlands should be promoted.
- f. Reforestation and afforestation of open spaces, resulting from cluster designs, should be required to enhance habitat, promote recharge and reduce surface runoff, erosion and flooding.
- g. Reductions in residential density and commercial/industrial impervious coverage standards should be considered to promote the retention of forests in Lebanon Township.

### **Groundwater**

The groundwater resources of the Township provide irrigation and potable water supplies to much of the Township's rural areas. In addition, groundwater provides the base flow to rivers and streams during low flow periods, and sensitive plant and animal communities are dependent upon this surface hydrology. The importance of groundwater resources is highlighted in the report *The Groundwater Resources of Lebanon Township*, prepared by M2 Associates for the Planning Board. The following activities are recommended to protect and maintain this critical resource:

- a. A public education program should be established to provide information to septic system owners concerning the proper maintenance of these facilities. An improved septic testing ordinance also should facilitate better operation of septic systems.
- b. Ongoing public education should be directed at preventing the discharge of toxic and hazardous pollutants to groundwater.
- c. The Environmental Commission, in conjunction with the Health Department, should conduct an environmental inventory of groundwater quality, including an analysis of existing groundwater samples and an identification of existing facilities which could adversely impact groundwater. Among the facilities that should be mapped and inventoried are the following:

1. Underground storage tanks.
  2. Gas, fuel, and sewer line locations.
  3. Large septic systems for commercial/industrial users.
  4. Permitted community septic systems.
  5. Hazardous substance storage areas and facilities.
  6. Permitted NJPDES groundwater or surface discharge facilities.
- d. The Township should consider the establishment of a wellhead protection program.
  - e. Landscaping standards should require the use of native and locally adapted plants, and designs which minimize irrigation, maintenance and turf areas and require mulches to preserve soil moisture.
  - f. The Township's aquifer testing ordinance should be monitored and periodically reviewed to ensure that it accomplishes the goal of assuring adequate water supply.
  - g. Reductions in residential density and commercial/industrial impervious coverage standards will serve to protect the availability and potability of groundwater.

### **Scenic Resources**

Scenic character is an important element in the general perception of the quality of life in Lebanon Township. The protection of scenic vistas, particularly those seen from public rights-of-way, will serve to maintain the Township's rural character. Since the local development review process plays a primary role in shaping new land use patterns, local review agencies are the appropriate administrative authority to encourage conservation of scenic characteristics. The following activities are recommended:

- a. Scenic roads and corridors should be identified and categorized in terms of the scenic elements that contribute to their quality.
- b. Design standards should be developed to guide the location and configuration of development, in order to protect the various categories of attractive views, including enclosed roadside views, extended roadside views, and distance views.

### **Steep Slopes**

Development of steep slopes produces a variety of environmental impacts, including increased soil erosion and sedimentation, decreased surface water quality, decreased soil fertility, increased overland flow, decreased groundwater recharge, and altered natural drainage patterns. In order to reduce the potential for these negative impacts, the Township should:

- a. Review and revise, if necessary, standards that relate the intensity of development to the slope gradient.
- b. Develop standards that limit tree removal and soil disturbance on steep slopes.

### **Stream Corridors**

The Township is laced with a network of headwater tributaries to the Musconetcong and South Branch Raritan Rivers. In order to protect stream corridors from development impacts, it is recommended that the Township consider the following management approaches:

- a. Woodlands and other vegetated buffers should be maintained or established along all stream corridors.
- b. Where past land use practices have resulted in the removal of trees along stream corridors, management practices should include the reestablishment of the tree cover.
- c. A stream corridor protection ordinance, modeled after the programs established by the Delaware and Raritan Canal Commission and the Stony Brook Millstone Watershed Association, which seeks to protect the stream corridor and adjacent wetlands, floodplains, and contributory uplands with steep slopes, should be implemented.
- d. Management and monitoring strategies should be developed for stream corridor areas.

### **Surface Water**

Surface water is impacted by both point and non-point source pollution. Non-point source pollution, which has become a major concern, can be mitigated by local land use strategies and management approaches. Non-point source pollutants include septic system effluent, agricultural runoff, stormwater runoff, and construction activities. In order to mitigate potential impacts to the Township's surface waters, the following management approaches are recommended:

- a. Water quality best management practices should be adopted or refined, to protect the quality of surface waters and promote maximum habitat values. These include:

Clustering development on the least porous soils, to promote infiltration

Buffer strips and techniques to maximize overland flow, such as grassed swales and filter strips

Regional stormwater management approaches and extended detention facilities

Wet ponds (retention basins) and wetland or marsh creation

Detain runoff using infiltration practices, including trenches, basins, drywells and other structural solutions

Water quality inlets and oil/grit separators

- b. Reductions in residential density and impervious coverage standards can reduce the potential impact to surface waters from non-point pollution.

### **Threatened and Endangered Plant and Animal Species**

Threatened and endangered plant and animal species are indicators of ecological diversity and environmental quality. Like the canaries in the coal mine, they warn us when we are spoiling the quality of the environment beyond natural tolerances. The presence of rare species in the Township are testament to the historical emphasis on land stewardship. In order to protect and maintain these species, the Township should:

- a. Conduct an ongoing inventory of threatened and endangered species.
- b. Design development so that it will not result in adverse impacts on the survival of threatened and endangered species.
- c. Develop a list of habitat requirements for endangered species.
- d. Map and preserve critical habitats, either through the open space acquisition or the development review process.
- e. Riparian wildlife corridors should be preserved, expanded or established.
- f. Preserve significant uplands areas where unique associations of habitats (some rare, some not) combine to promote biodiversity.
- g. Preserve nodes of biodiversity wherever they occur.
- h. Reductions in permitted residential density can also promote the preservation of critical habitats.

### **Wetlands**

Since wetlands are regulated by the State and Federal governments, the Township is preempted from adopting conflicting regulations. However, management of protected wetlands and transition areas remains an important issue, and site design decisions will affect wetlands ecosystems.

- a. A system to periodically monitor and enforce conservation easement restrictions should be developed.
- b. Permitted development should be arranged to avoid all significant wetlands, and when road crossings are unavoidable, they should be located at the point of minimum impact.

### **Relationship To Land Use Plan**

The Conservation Plan identifies natural resource protection strategies which support the Land Use Plan. The resource management standards outlined in the Conservation Plan will serve to shape the development permitted by the Land Use Plan in a manner that will preserve and protect the Township's natural resources. In addition, the Conservation Plan is intended to involve local agencies, other than the Planning Board, in a comprehensive program to conserve critical resources.

## **Land Use and Natural Resource Background Information**

### **Land Use by Property Class**

Tax class is often times a good indicator of the type of use present on a property. With the availability of tax data at the municipal level, and coupled with a tax parcel coverage, a map can be composed showing various land uses and ownership categories and give a fairly accurate picture of land use patterns. However, a land use classification system by tax class assigns a single use to each lot, and thus tends to obscure more detailed information concerning woodlands and wetlands on a lot.

According to data provided by the Hunterdon County Division of GIS, the predominant property class in Lebanon Township is agricultural at 47%, representing 9,335 acres of the Township's 20,250 acre land area (see Figure 2). This is followed by residential at 29% of the total, public land at 13%, and vacant land at 8%. Commercial and industrial uses comprise a mere 1.3% and 0.2% of the Township, respectively.

These data were also analyzed by zoning district, and show an interesting pattern relative to the land use characteristics of the different residential zoning districts. As the density of the zoning district decreases, the amount of residential development also decreases, and the amount of agricultural, vacant and public lands increases.

Given the differences in methodology and mapping conventions, it is not possible to directly compare current land use to land use summaries in past Master Plans. However, in general, residential development has resulted in a loss of agricultural and vacant lands, while public lands have increased as a result of open space acquisitions.

### **Land Use/Land Cover**

A more detailed and accurate depiction of land use can be taken from the Land Use/Land Cover classification, completed by the New Jersey Department of Environmental Protection. This data was derived from the 1995 Digital Ortho Quarter-Quads, flown for the entire State. As a comparison to the Land Use by Property Class, the Land Use/Land Cover data shows what is actually on the ground. The Property Class information may show an entire property as farm assessed, giving the impression that all of its acreage is farmed. In truth, 50% of the tract may be wooded and not farmed at all. The Land Use/Land Cover is more accurate in that it will show the true land use of the property, where, for example, 5% may be residential, 50% wooded and 45% cultivated.

Generally speaking, Lebanon Township is primarily wooded (see Figure 3). Nearly 56% of the land in the Township is covered by forest, much of which represents high priority habitat for wildlife. The spine of the Township is made up of large contiguous tracts of forest, which provide suitable habitat for a number of animal species, including some that are threatened or critical. A number of these contiguous forested tracts are County and State parkland, preserved in perpetuity.

Agricultural uses cover approximately 19% of the Township's total acreage, or approximately 3,865 acres. Masses of farmland occur in four general areas: along Forge Hill Road; around the Borough of Califon; in the Mt. Lebanon Road, Sharrer Road, and Anthony Road area; and, along West Hill Road. Comparing the land use by property tax to the land use/land cover, almost 60% of the land classified as agricultural by tax class is actually wooded.

Land Use/Land Cover designated as urban on the mapping covers land uses that range from single rural residential units to commercial and industrial uses. The general classification of urban describes areas that are developed in one fashion or another. The urban land covers approximately 17% of the Township. There are certain hamlets that have a higher concentration of urban types of uses, including Bunnvale, Lower Valley, New Hampton and Woodglen. Other concentrations of developed lands occur along Route 31, West and East Hill Roads, and Sliker Road.

Lebanon Township contains other environmentally sensitive lands, comprised mainly of forested wetlands and mature deciduous forest. Geographically, most of the wetlands are found in the northern half of the Township and are protected by surrounding forested areas. These wetlands and forested areas are a part of the overall critical habitat system and represent a symbiotic relationship. Overall, wetlands make up 8% of the total area of the Township.

Barren land and water make up a very small portion of the Township's overall land use at 0.3% and 0.6% respectively.

### **Geology and Hydrogeologic Zones**

The bedrock of Lebanon Township can be divided into two general groupings primarily based on age and rock type. The geology of Lebanon Township is shown on Figure 4.

Precambrian (older than 570 million years) igneous and metamorphic rocks underlie approximately 90 percent of the Township. Gneiss and granite underlie much of this area. The rocks in this portion of the Township include members of the Byram and Lake Hopatcong Intrusive Suites, Losee Metamorphic Suite, metasedimentary rocks, diabase intrusions, Chestnut Hill Formation, and other rocks of uncertain origin. The Precambrian rocks have been extensively deformed into a series of southwest to northeast trending folds.

The second groupings of rocks are mapped beneath approximately 10 percent of the Township along the northern boundary and in the southeastern portion near the Borough of Califon. These rocks include the Ordovician-Cambrian (440 to 570 million years ago) dolomites and limestones of the Leithsville, Allentown, Beekmantown, and Jacksonburg Formations. This group also includes the shales of the Bushkill Member of the Ordovician Martinsburg Formation and the quartzites of the Hardyston Formation.

Given the differences in median specific capacities, transmissivity estimates, depths and well yields between the Precambrian igneous and metamorphic rocks and the Ordovician-Cambrian limestones and dolomites, Lebanon Township was divided into four hydrogeologic zones with each zone underlain by one of two distinct aquifer systems. The name of each zone is based on the underlying type of bedrock aquifer system. These zones are shown on Figure 4.

Most of the Township, including a very small section near Califon Borough, is underlain by the aquifer system comprised of Precambrian igneous and metamorphic rocks and therefore, both zones are referenced as a Precambrian Crystalline Rock Zone. A limited area near the northwestern border of the Township and the area beneath Long Valley in the southeastern portion of the municipality are underlain by limestone and dolomite aquifer systems and therefore, these zones are referenced as Limestone/Dolomite Zone.

### **Topography**

Lebanon Township is at the foot of the New Jersey Highlands physiographic province and represents the beginning of some of the most varied terrain in New Jersey. The Highlands are home to some of the most scenic areas in the State and represent the most significant animal habitats and forest resources found anywhere in New Jersey outside of the Pinelands Area.

Most of the land in the Township is 400' above sea level, with the exception of lands located directly adjacent to the Musconetcong River and the South Branch of the Raritan River. Even in these areas, elevations are close to 400' feet above sea level. The highest elevation in the Township is located in the vicinity of Pleasant Grove Road and is above 1040' (see Figure 5).

There are a number of scenic ridgelines in the Township. The area of Point Mountain, a County Park, represents some of the most scenic land found in the County. From the peak of Point Mountain, the terrain runs steeply to the Musconetcong River valley, providing many breathtaking views, which stretch the entire length of the Township's eastern border. The terrain from the Warren County side of the Musconetcong River slopes gently to the waterway, providing sharp contrast to the Lebanon Township side. It also provides vistas of many miles, consisting of rolling hills and farmland. The valley of the South Branch of the Raritan River also provides unique views, although not stretching as far as those of the Musconetcong Valley. Both sides of the South Branch run steeply to the River, making for a gorge that runs the entire length of the River through the Township. The Columbia Trail, which runs next to the South Branch, provides wonderful hiking along steep and often varied terrain, offering stunning views of the River itself.

The two river valleys, along with the southwestern corner of the Township where it borders Bethlehem Township, the Teetertown Ravine Nature Preserve, the Rocky Run and Route 513 areas, and the Turkey Top Road area, possess the majority of the Township's steep slope areas. These are slopes classified as greater than 15%, which

comprise nearly 25% of the Township's land area. Slopes greater than 25% comprise 7% of the Township's area, as shown on Figure 6. These areas of the Township deserve special attention and management approaches to reduce runoff and erosion and to maintain water quality and water supply.

### **Forested Areas**

Nearly 87% of Lebanon Township's forested areas are deciduous forest, according to data provided by the New Jersey Department of Environmental Protection (see Figure 7). As stated earlier, on the whole, 56% of the Township's area is forested. Much of this forested area represents lands that are of significant resource value as habitat for threatened and endangered species.

Lebanon Township contains most of the remaining large contiguous forests in Hunterdon County. These forests are attractive habitat for a number of different bird and animal species. Contiguous forest provides a greater diversity of territory, along with less chance of human intervention. This is an important resource that must be given priority for preservation efforts amongst State, County and local plans.

Many of the contiguous forested areas of the Township have been protected through the preservation efforts of both the State and the Hunterdon County Parks System. Vorhees State Park, the Musconetcong River Reservation, Teetertown Ravine, Ken Lockwood Gorge and the Columbia Trail areas all contain significant contiguous forest resources that are permanently preserved.

The other forested areas of the Township are made up of coniferous forest (2% of the forested areas), deciduous brush and shrub land (5%), former fields (4%), mixed brush and shrub land (0.7%), mixed forest (3%) and plantations (1.3%). These categorizations together comprise only 13% of the forested area in the Township and are not as significant in terms of habitat provision as the deciduous forest areas.

### **Freshwater Wetlands**

The regulatory framework for the identification and protection of freshwater wetlands in New Jersey was established by the Freshwater Wetlands Protection Act (FWPA) of 1987. Among the unique values of wetlands are the purification of surface water and groundwater resources; the mitigation of flood and storm damage through the storage and absorption of water during high runoff periods; the retardation of soil erosion; the provision of essential breeding spawning, nesting and wintering habitats for the State's fish and wildlife; and, the maintenance of critical base flows to surface waters through the gradual release of stored flood waters and groundwater. The method for identifying and designating wetlands includes three parameters; hydrology, soil and vegetation. The hydrological factor relates to the degree of flooding or soil saturation found through soil borings; the soil factor relates to the presence of hydric soils; and, the vegetation factor relates to the presence of hydrophytes or plant species adapted to hydric conditions.

One of the requirements of the FWPA was that the N.J. Department of Environmental Protection (NJDEP) provide a comprehensive mapping of wetlands in the State. The attached map of Freshwater Wetlands is provided from the 1995 Land Use/Land Cover data, derived from digital aerial photography. Although the wetlands are not broken down by category on the mapping, they include the following classifications:

- Agricultural wetlands (modified)
- Artificial lakes
- Coniferous wooded wetlands
- Deciduous scrub/shrub wetlands
- Deciduous wooded wetlands
- Disturbed wetlands (modified)
- Herbaceous wetlands
- Managed wetlands (modified)
- Mixed forested wetlands (deciduous dominate)
- Natural lakes
- Streams and canals
- Wetlands rights-of-way (modified)

The greatest concentrations of wetlands occur below the ridge lines, in linked systems and in clusters. The vast majority of the wetlands feed into the stream network and are interspersed with many of the forested areas found throughout the Township (see Figure 8). Their primary composition is deciduous wooded wetlands, making them a contributing factor to the Township's already extensive high quality wildlife habitat.

Although the NJDEP mapping of wetlands can provide guidance as to the location of wetlands, only a field investigation can substantiate the presence or absence of wetlands. It is through this investigation that the resource value of wetlands is determined, providing for the appropriate buffers in order to aid in their continuing function.

### **Water Quality**

Lebanon Township's streams discharge into the Spruce Run Reservoir and South Branch of the Raritan River or the Musconetcong River. Downstream, the Musconetcong drains into the Delaware River. Lebanon Township is in the Upper Delaware Watershed Management Area 1 (20% of the Township) and the North and South Branch Raritan Watershed Management Area 8 (80% of the Township).

The Upper Delaware and Raritan River watersheds provide recreational and water supply opportunities which depend upon high quality river water. Water pollution sources are categorized as either point or non-point source pollutants.

A point source pollutant emanates from an identifiable source such as a wastewater treatment plant discharge pipe or an industrial plant outfall. Non-point source pollutants enter rivers and streams by non-specific means such as septic system effluent,

agricultural runoff, stormwater runoff and construction activities. Both point and non-point sources of pollution affect Lebanon Township's surface water quality.

The NJDEP has developed Water Quality Standards to replace the Water Quality Index, which were found to be archaic in its approach to water quality assessment. Water quality is evaluated with respect to Surface Water Quality Standards (SWQS) and water quality issues or concerns occur when SWQS are not met or are threatened. New Jersey's Surface Water Quality Standards (N.J.A.C.7:9B) establish the water quality goals and policies underlying the management of the state's water quality. These standards designate the use or uses of the water and establish policies and narrative and numerical criteria necessary to protect the uses.

According to the Statewide Water Quality Management Program Plan, all surface waters in Lebanon are included in the classification of FW2. This plan, prepared by NJDEP, notes that the ". . .FW2 classification is subdivided into three sub-categories: FW2-TP (trout production), FW2-TM (trout maintenance), and FW2-NT (nontrout). The water quality standards criteria for suspended solids, dissolved oxygen, temperature, and un-ionized ammonia are more stringent for FW2-TP and FW2-TM waters than they are for FW2-NT waters. In addition, the Surface Water Quality Standards identify all FW2-TP waters (and other upstream from these waters) as Category One Waters for purposes of antidegradation policy."

***Water Classifications:*** Surface waters are grouped into classifications as follows:

- **FW1:** Fresh Water 1: Fresh surface waters that are to be maintained in their natural state and not subjected to man-made wastewater discharges or increases from runoff from anthropogenic activities.
- **FW2:** Fresh Water 2: General fresh surface water classification applied to fresh waters that are not FW1 or Pinelands Waters.
- **FW- TP:** Fresh Water - Trout Production waters are designated for trout spawning/nursery during their first year.
- **FW- TM:** Fresh Water - Trout Maintenance waters are designated for the support of trout throughout the year.
- **FW- NT:** Fresh Water - Non Trout: fresh surface waters that have not been designated TM or TP. These waters are generally unsuitable for trout because of their physical, chemical, or biological species, but are suitable for a wide variety of other fish species.
- **C1:** Category 1 waters are designated for implementation of antidegradation policies for protection from any measurable change in water quality. C1 may be applied to any surface water classification except those designated as FW1 or PL.

Note: the Department is currently proposing a clarification between the definition of ND and C1 antidegradation policies.

The following list identifies the rivers and streams in Lebanon that have been designated according to water quality standards established by the NJDEP (see Figure 9):

- South Branch Raritan River : FW2-TM
  - South Branch Raritan River (Ken Lockwood Gorge and its tributaries): FW2-TM(C1)
- Musconetcong River: FW2-TM
- Spruce Run: FW2-TP
- Rocky Run: FW2-TP
- Willoughby Brook: FW2-TP
- Teetertown Brook: FW2-TP
- Little Brook: FW2-TP

Although the surface waters in Lebanon Township generally consist of good water quality and healthy fish communities, future growth may have deleterious effects. Thus, management strategies for existing and future land uses should be designed to maintain and to improve river water quality.

### **Agricultural Soils**

The State Agricultural Development Committee (SADC) established the current classification system used throughout the State in 1990 under the Agriculture Retention and Development Act of 1983. This system refines the agricultural capability classifications established by the USDA, NRCS, which had been the standard for 20-30 years, by rating agricultural soils for their specific applicability to New Jersey. While the USDA classification system provided ratings of agricultural soils based on an eight part system (Agricultural capability classes I-VIII), the classification system developed under the Agriculture Retention and Development Act established a five part system; prime farmlands, soils of statewide importance, farmland of local importance, unique farmlands and other. This system is used to classify soils shown on Figure 10.

Agriculture makes up 19% of the land use in the Township, according to the Land Use/Land Cover map, but includes 47% of the Township's land area within the farmland assessed property tax class, indicating its importance to the open lands in the Township. The mapping of prime farmland and soils of statewide importance found within Lebanon provides some indication of why this is so. Prime farmland comprises only 15% of the soil classes and soils of statewide importance a mere 8%. A comparison of the land use/land cover mapping with the agricultural soils mapping indicates, however, that most of the prime and statewide important soils in the Township continue to be used for agriculture.

Prime and statewide important soils, as rated by the SADC, are an irreplaceable resource, but also have many of the qualities that make them attractive for residential and non-residential development. Attributes such as level land, good drainage and fertility create competition between agriculture and development. While prime and statewide important soils will continue to provide fertile ground for agricultural uses, they will slowly yield to development interests if support for agriculture as an industry does not continue.

The following descriptions of prime farmlands and soils of statewide importance are taken from the “New Jersey Important Farmlands Inventory”, prepared by the SADC in 1990. Not included in this description are soils of local importance and unique farmlands. There are no soils of local importance within Lebanon Township that are identified by the SADC. Unique farmlands are poorly drained soils that are uniquely suited to the production of cranberries and blueberries, and which do not occur in the Township.

***Prime Farmlands*** – Prime Farmlands include all those soils in Land Capability Class I and selected soils from Land Capability Class II. Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and is also available for these uses. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods. Prime Farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding.

***Soils of Statewide Importance***- Farmlands of statewide importance include those soils in Land Capability Class II and III that do not meet the criteria as Prime Farmland. These soils are nearly Prime Farmland and economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce yields as high as Prime Farmland if conditions are favorable.

### **Limitations for the Onsite Disposal of Sewage Effluent**

Figure 11 depicts limitations for the onsite disposal of sewage effluent. This map is a soils classification map that applies numerous factors to provide a composite representation of environmental limitations. Important soil properties represented in this depiction are percolation rate, depth to seasonal high water, slope, rockiness, depth to and type of bedrock and hazard to flooding. While this map layer does not have regulatory implications, it provides a general depiction of which soils within the Township are most likely constrained for future development interests. The descriptions below give an idea of the general factors that went into each classification.

***Severe Limitations***- The severe limitations category identifies soil phases which indicate that soil properties are so unfavorable or difficult to overcome that the soil is unsuitable for development or requires special design. This produces significant increases in construction costs and requires intensive maintenance. Approximately 21% of the soil phases in Lebanon Township are categorized as having severe limitations. The factors

identified in the Soil Survey of Hunterdon County (USDA, NRCS) which contribute to severe limitations are as follows:

- High water table (0-1' below the surface)
- Water table moderately high (1-2 ½' below the surface)
- Frequent stream overflow
- Slow permeability
- Very stony
- Depth to bedrock (½ - 6')
- Moderately steep slopes (12-18%)
- Steep slopes (18-30%)

***Moderate Limitations*** – The moderate limitations category identifies soil phases that indicate that soil properties are unfavorable but that limitations can be overcome by careful planning and design, careful construction and good management. Approximately 29% of the soils in the Township are classified as having moderate limitations for onsite disposal of sewage effluent. The factors identified in the Soil Survey Manual that contribute to the moderate limitations category are as follows:

- Depth to bedrock (4-6' or 5-10')
- Stream overflow hazard
- Strong slopes (6-12%)

***Slight Limitations*** – The slight limitations category includes soil phases that have soil properties that are generally favorable for the onsite disposal of sewage effluent or, in other words, have minor limitations that are easily overcome. Approximately 28% of the soil phases in Lebanon have only slight limitations for onsite disposal; however, most of these soils are already developed or are permanently preserved as public lands.

***Unclassified Soils*** - Of significance relative to this classification are those soils in the Township that are unclassified for disposal of effluent. This is due to their unusually steep slopes and generally stony composition, making the factors that contribute to disposal capability not quantifiable. The inability to quantify the limitations because of the poor quality indicates that these soils have similar characteristics to those with severe limitations. These soil types are found mainly on ridges and steep slopes that form stream corridors, which are lands unsuitable for development. Examples of where the soils are unclassified are the Ken Lockwood Gorge; Point Mountain and the associated severe slopes, extending to Turkey Top Road; the severe slopes along Musconetcong River Road; and, the severe slopes along Route 31.

### **Depth to Bedrock**

Depth to bedrock is the measure of the thickness of the soil above rock and fractured material. Bedrock occurring within 5' of the surface has associated with it problems of foundation placement, grading, location of utilities and lack of soil volume necessary to filter sewage effluent. These are all factors that limit, but often do not prohibit

construction in areas that possess bedrock within 5' of the surface. Many times, the practice of engineering will arrive at a solution that addresses concerns associated with limiting factors and allow for development, although at a greatly increased cost. All of these factors must be considered when determining the types of development that are appropriate to various contributing factors.

Figure 12 shows the location and classification for all of the soil phases found in the Township. There are no soil phases which have bedrock less than 3.5' from the surface, yet this still contributes to moderate limitations for septic effluent disposal and would limit foundations for dwellings and excavation for roadways or utilities. It should be noted that most of the categories presented on the map have variation within the categories, some of them substantial. There is a notable difference in suitability for many construction practices just within the 3.5-8' categorization, as 5' is the true point of limitations.

There is a considerable amount of land in the Township that is incapable of classification with respect to depth to bedrock. Nearly 21% of the soil phases are unclassified due to their steep slopes and stony composition. This comprises a relatively large percentage of the Township as a whole. The category of 3.5-8' is variable and presents more limitations than not. As stated previously, bedrock at a depth of 5' or less presents limitations in construction practices. This category comprises 52% of the land and taken with the unclassified soil phases, presents limitations on more than 75% of the Township. Approximately 20% of the soil phases in the Township have bedrock at a depth of 6-10'+, which should indicate deep soils with relatively few limitations for construction.

### **Depth to Seasonal High Water**

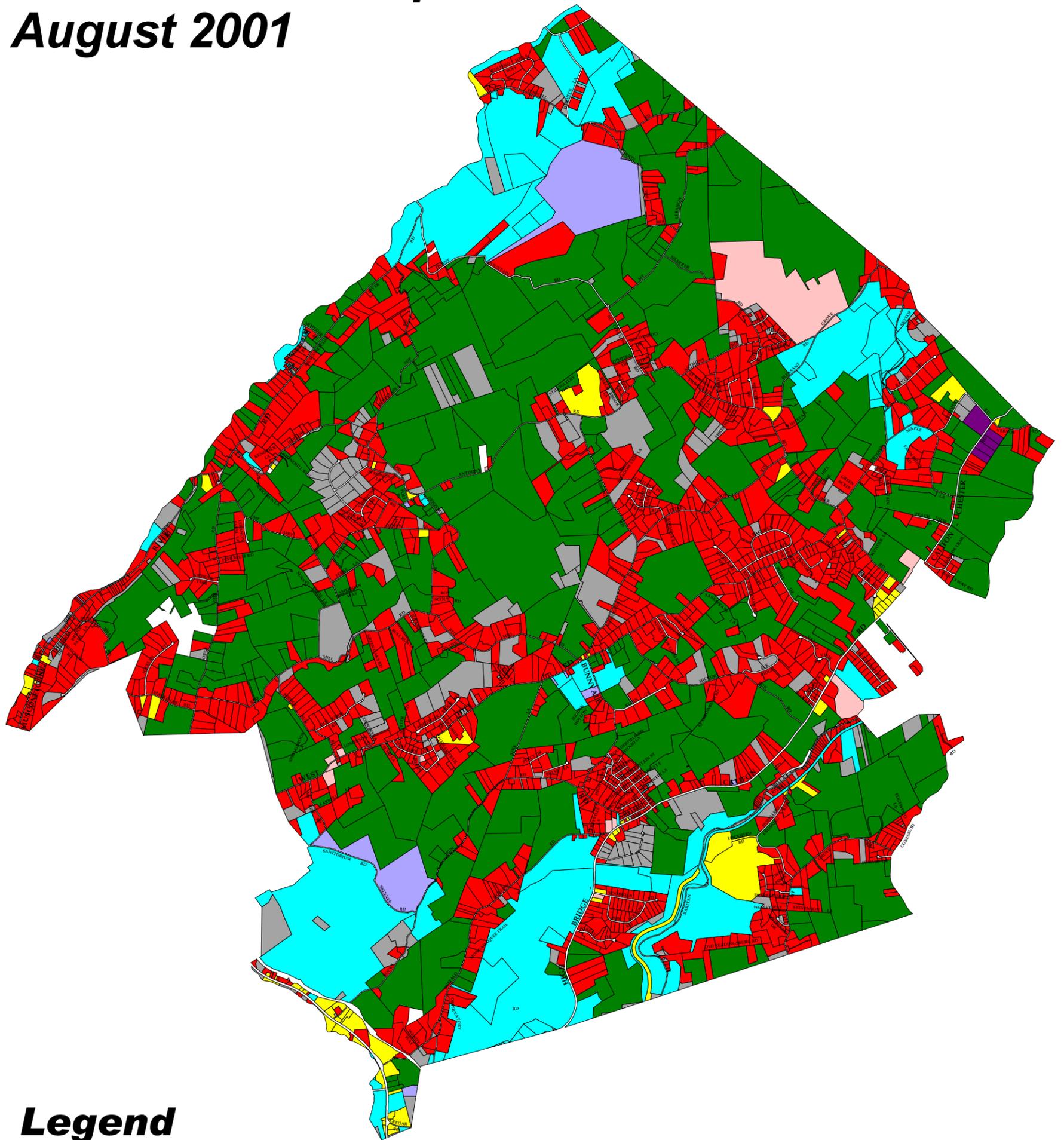
The depth to seasonal high water table is the distance from the surface to the highest level that groundwater reaches in the soil. This is referred to as seasonal high water as groundwater generally reaches its highest level between December and April. The depth to seasonal high water table is an important determinant of the limitations and opportunities for development.

Shallow depths to the water table present a number of problems with development. High water table can cause frequent flooding of basements and weaken foundations, while also presenting very serious limitations for onsite disposal of septic effluent. Effluent must permeate the soil in order to be properly processed and can be blocked by a high water table. In addition, while shallow water table depths are not appropriate for development, they often support diverse vegetation and wildlife communities. Protection of soils having shallow water tables will limit the destruction of property while also promoting diversity amongst plant and animal communities.

Figure 13 shows that 42% of the soil phases fall within the ranges that are considered limited with respect to the problems noted above. These include soils with high water tables from 0-3' below the land surface. The remaining soil phases in the Township have

a depth of 4-8', generally indicating adequate depth to the seasonal high water table for a number of different planning factors.

**Figure 2**  
**Land Use By**  
**Property Class**  
**Lebanon Township**  
**August 2001**



**Legend**

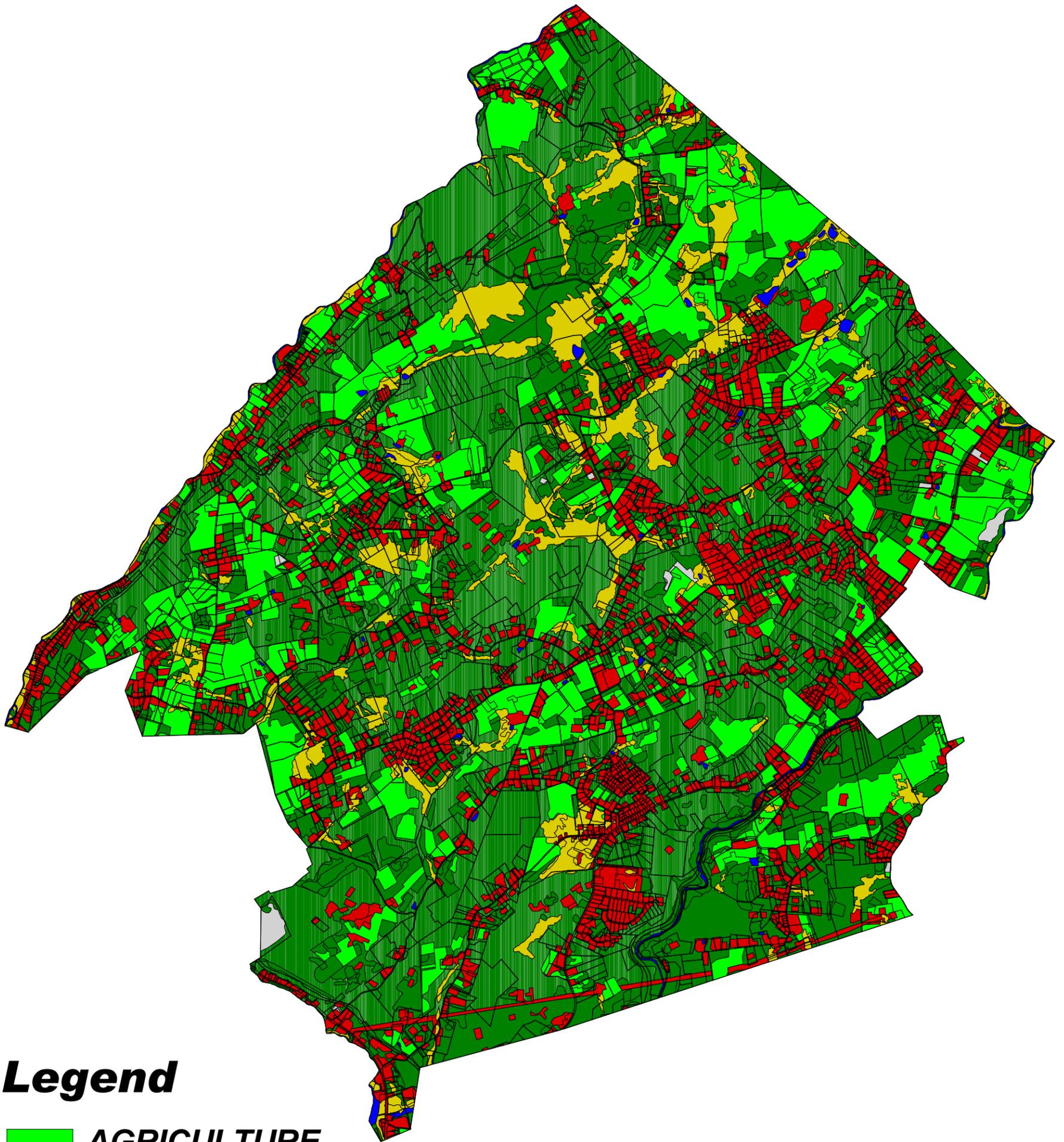
-  **Agricultural**
-  **Cemetary/Church**
-  **Commercial**
-  **Industrial**
-  **Public**
-  **Quasi-Public**
-  **Residential**
-  **Vacant**



1 0 1 2 Miles

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Data Sources:  
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# Figure 3 Land Use /Land Cover Lebanon Township August 2001



## Legend

	<b>AGRICULTURE</b>
	<b>BARREN LAND</b>
	<b>FOREST</b>
	<b>URBAN</b>
	<b>WATER</b>
	<b>WETLANDS</b>



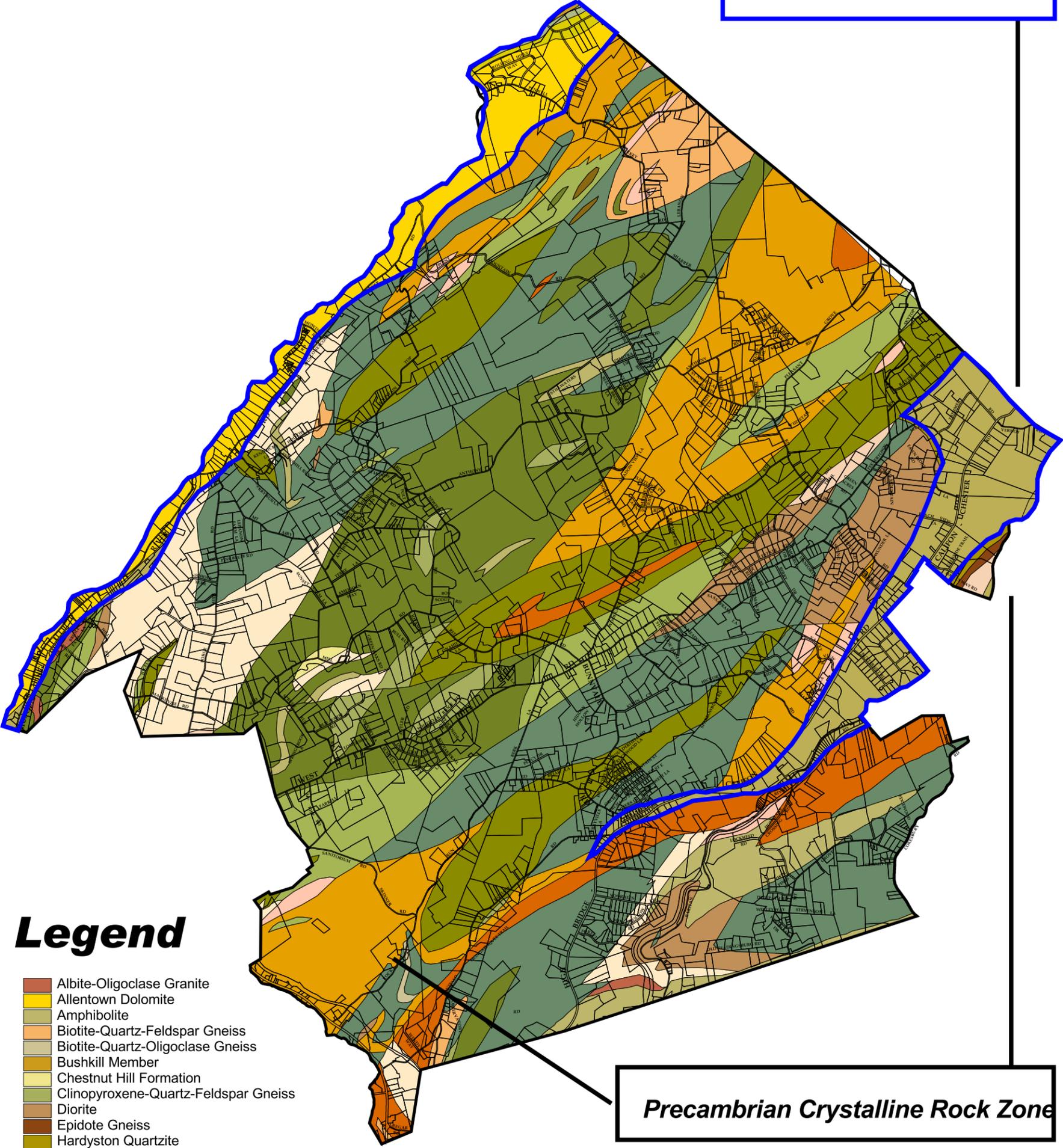
1 0 1 2 Miles

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# Figure 4 Geology Lebanon Township August 2001

Limestone/Dolomite Zone



Precambrian Crystalline Rock Zone

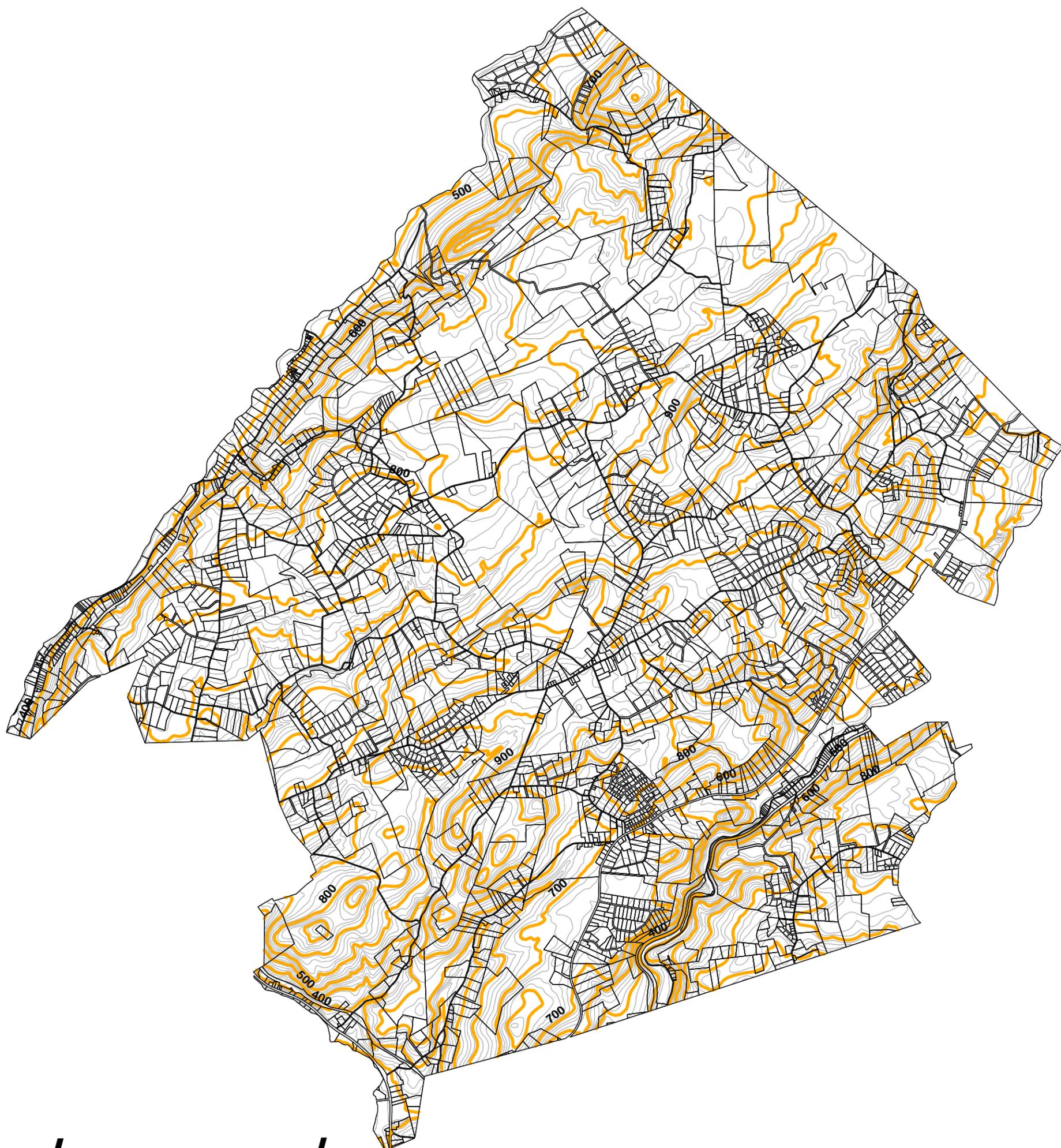
## Legend

- Albite-Oligoclase Granite
- Allentown Dolomite
- Amphibolite
- Biotite-Quartz-Feldspar Gneiss
- Biotite-Quartz-Oligoclase Gneiss
- Bushkill Member
- Chestnut Hill Formation
- Clinopyroxene-Quartz-Feldspar Gneiss
- Diorite
- Epidote Gneiss
- Hardyston Quartzite
- Hornblende Granite
- Hornblende-Quartz-Feldspar Gneiss
- Hypersthene-Quartz-Oligoclase Gneiss
- Jacksonburg Limestone
- Leithsville Formation
- Lower Part
- Microperthite Alaskite
- Potassic Feldspar Gneiss
- Pyroxene Alaskite
- Pyroxene Gneiss
- Pyroxene Granite
- Pyroxene Syenite
- Quartz-Oligoclase Gneiss
- Upper Part



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# Figure 5 Topography Lebanon Township August 2001



## Legend

-  **20 Foot Contour**
-  **100 Foot Contour**

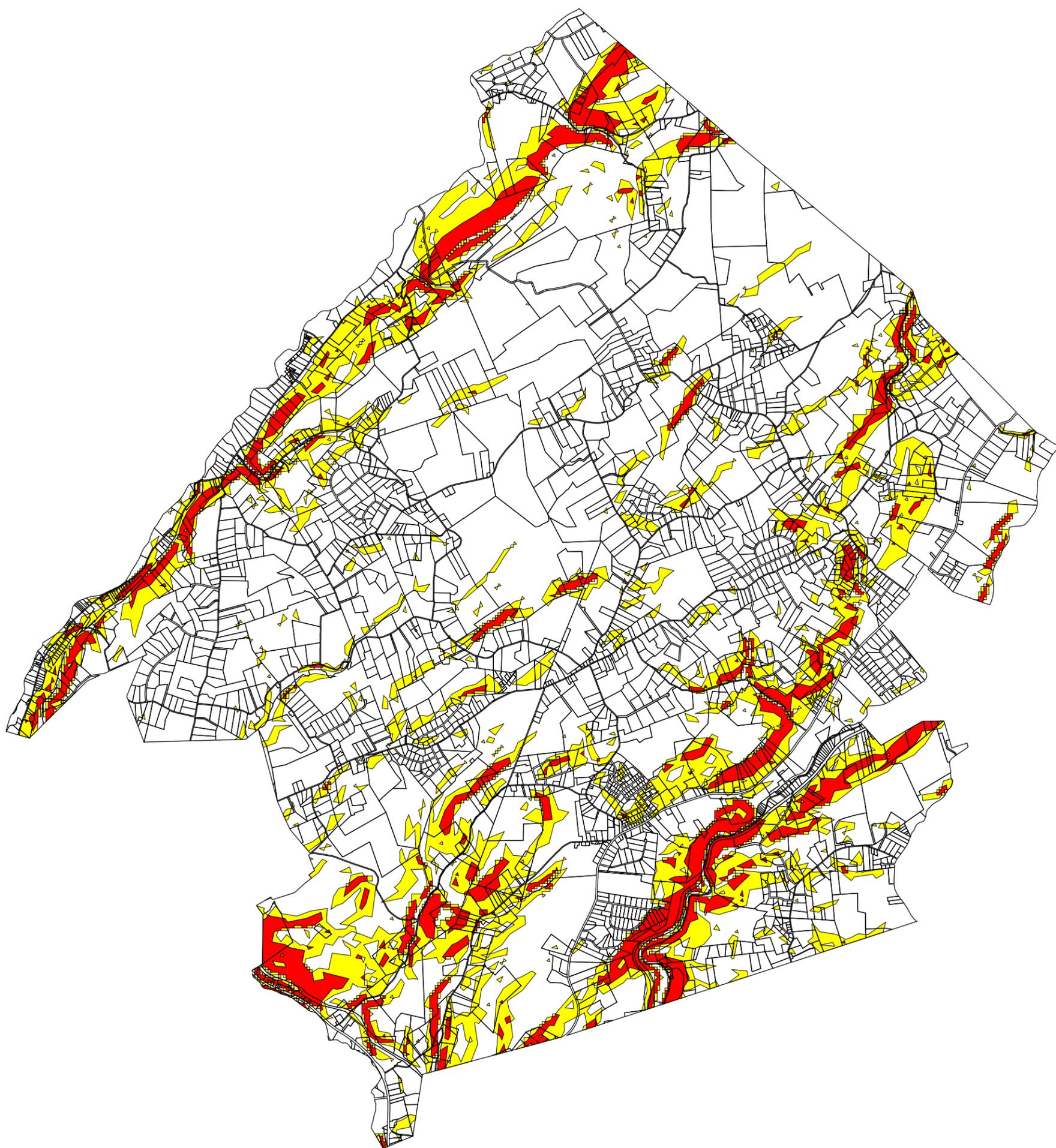


1 0.5 0 1 2 Miles



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USGS

# Figure 6 Steep Slopes Lebanon Township August 2001



## Legend

-  Slopes of 15%-24.99%
-  Slopes of 25% and Greater



1 0 1 2 Miles

A horizontal scale bar with markings at 1, 0, 1, and 2 miles.

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# Figure 7 Forested Areas Lebanon Township August 2001



## Legend

-  **Coniferous Brush and Shrubland**
-  **Coniferous Forest**
-  **Deciduous Brush and Shrubland**
-  **Deciduous Forest**
-  **Former Field, Brush Covered**
-  **Mixed Deciduous/Coniferous Brush and Shrubland**
-  **Mixed Forest**
-  **Plantation**

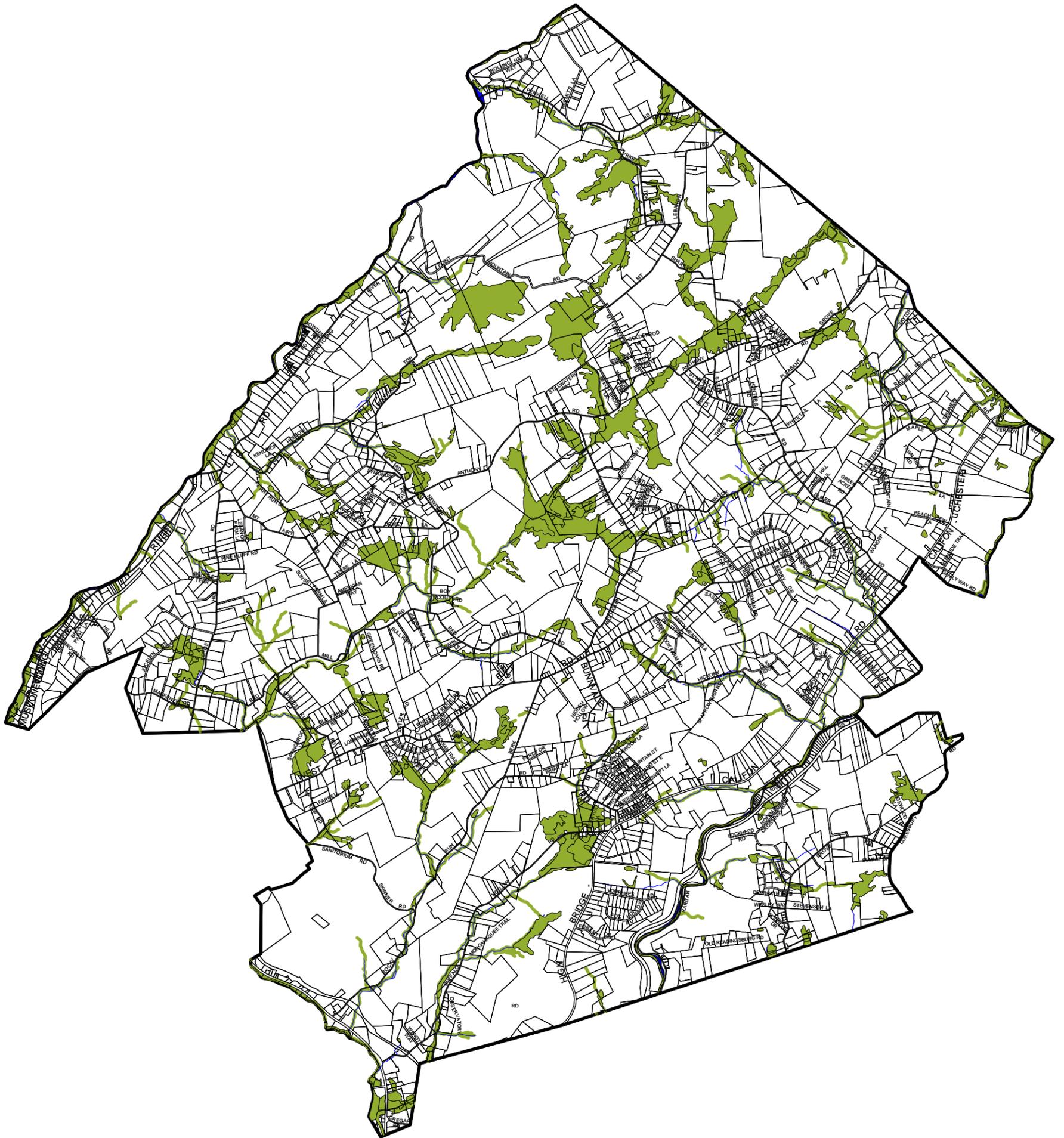


0 1 Miles

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# Figure 8 Wetlands Lebanon Township August 2001



## Legend

-  **Wetland Areas**
-  **Drainage Areas**
-  **Rivers and Streams**



1 0.5 0 1 2 Miles

This map was developed using NJDEP Geographical Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

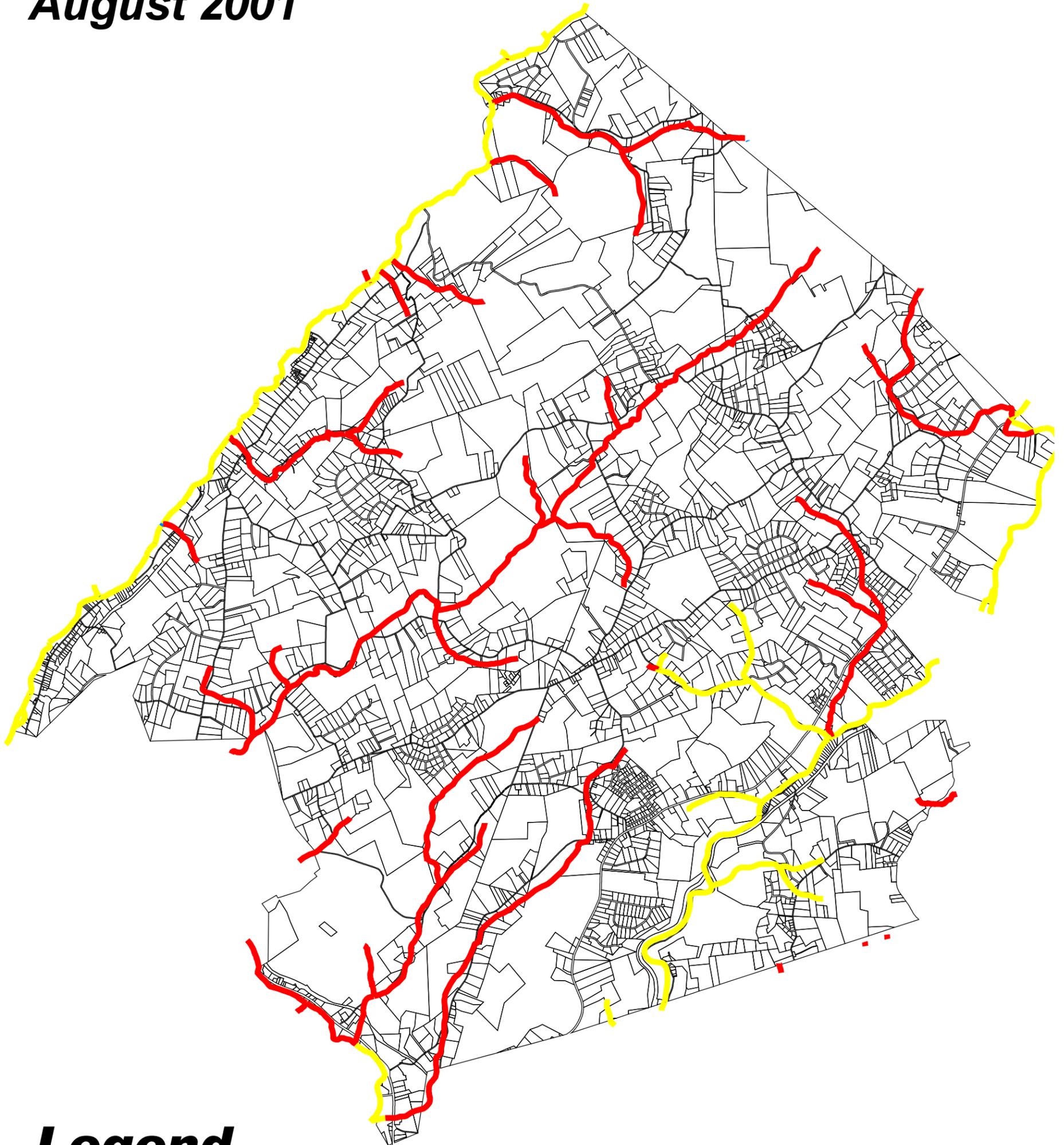
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# Figure 9

## Trout Maintenance and Trout Production Designations

### Lebanon Township

#### August 2001



## Legend

 **Trout Production**

 **Trout Maintenance**

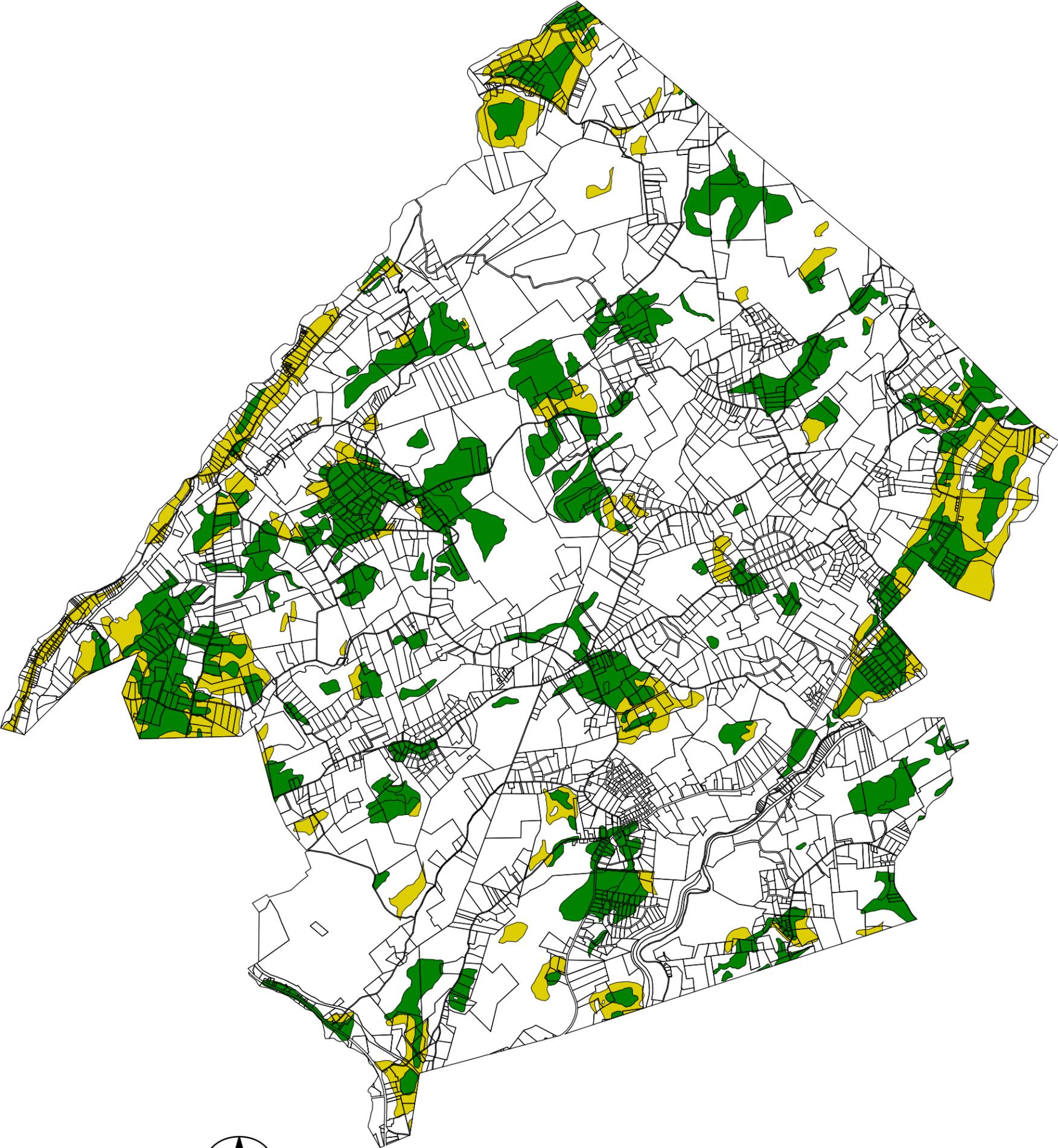
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1 0 1 2 Miles



**Figure 10**  
**Prime and Statewide**  
**Important Agricultural Soils**  
**Lebanon Township**  
**August 2001**



**Legend**



-  **Prime Soils**
-  **Statewide Important Soils**



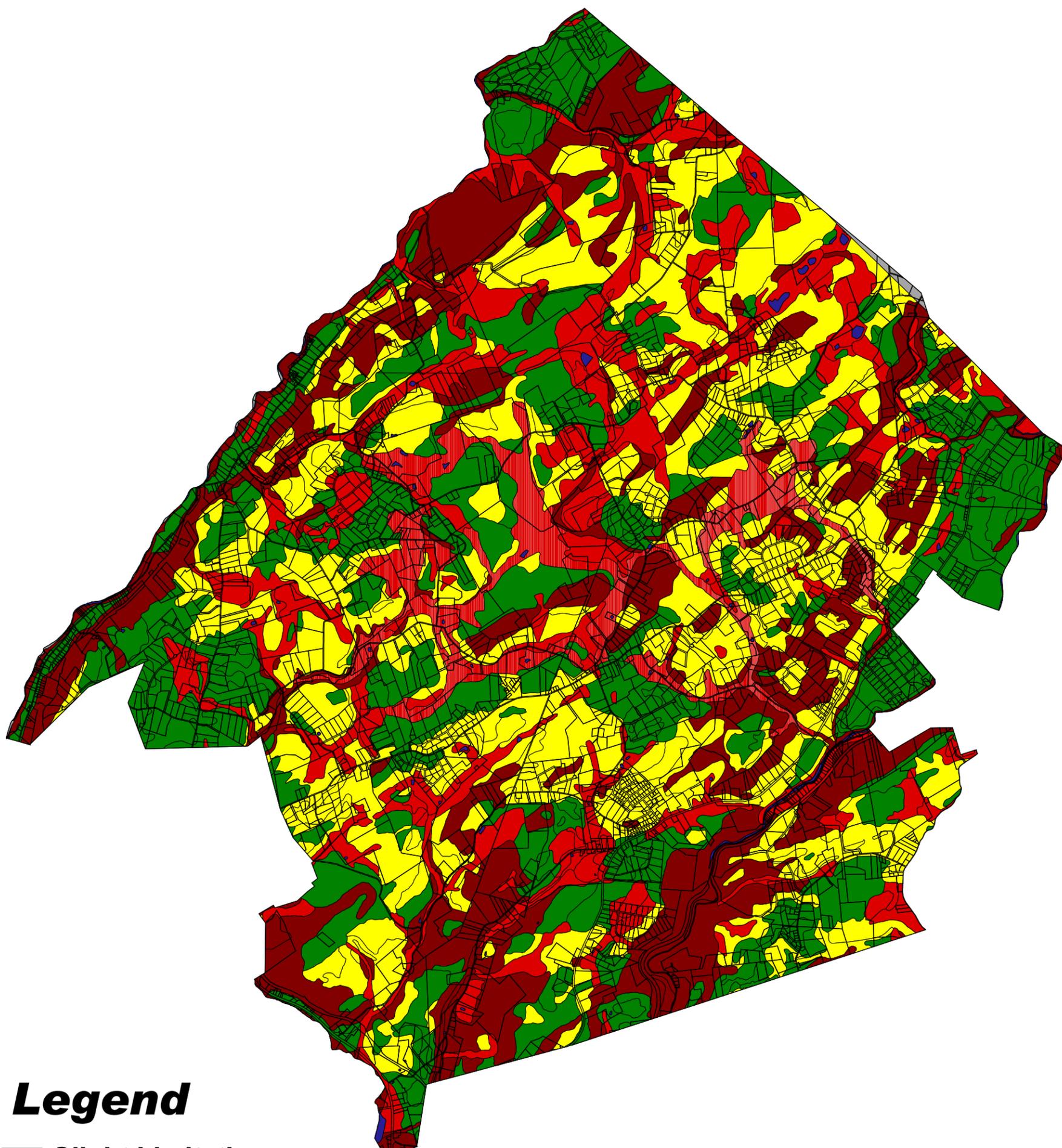
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Data Sources:  
Hunterdon County Division of GIS  
Hunterdon County Soil Survey - USDA

# Figure 11

## On-Site Septic Limitations

### Lebanon Township

August 2001



## Legend

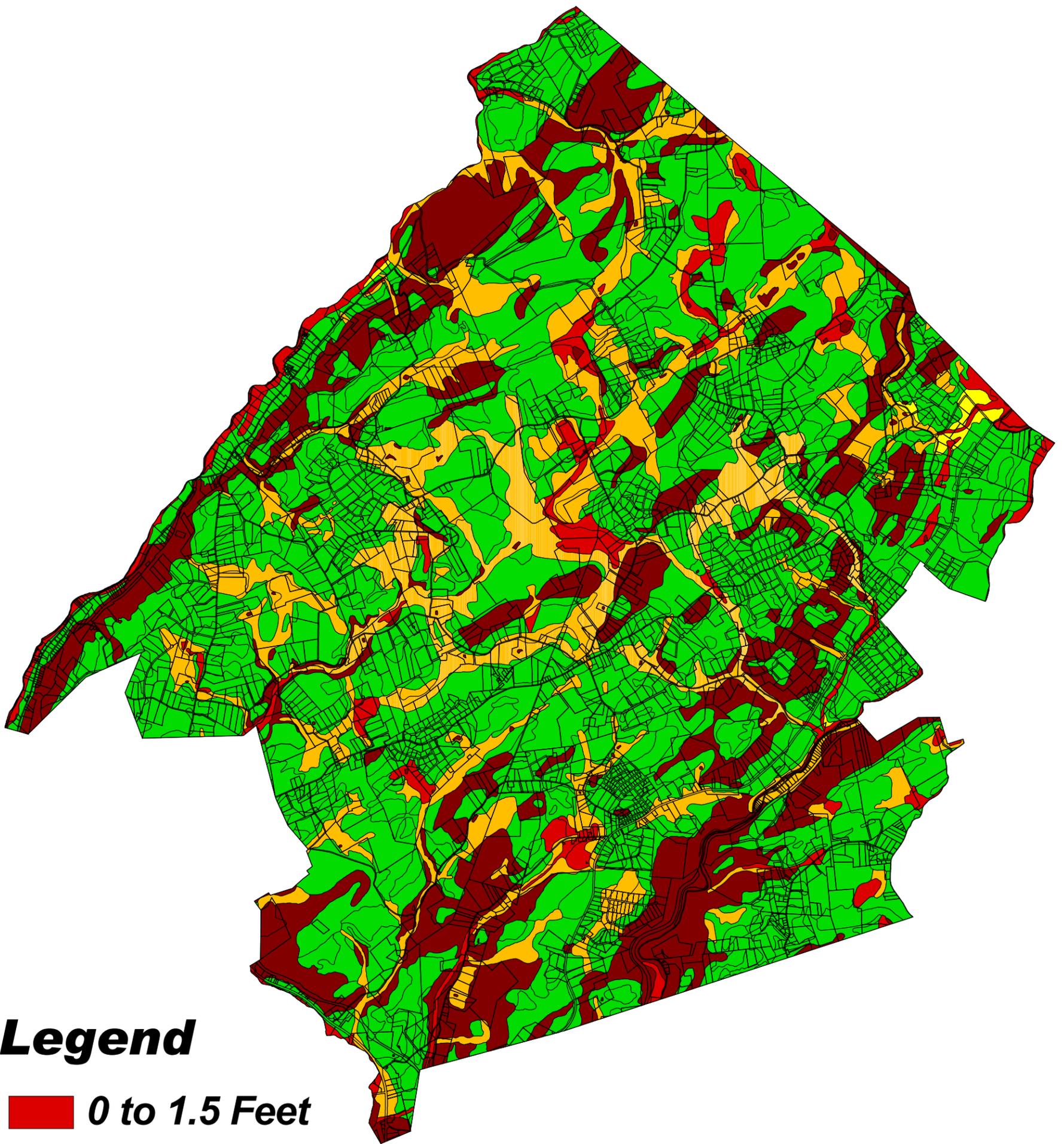
-  Slight Limitations
-  Moderate Limitations
-  Moderate to Severe Limitations
-  Severe Limitations
-  Unclassified
-  Water
-  No Data

1 0 1 Miles



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**Figure 13**  
**Depth to Seasonal High Water**  
**Lebanon Township**  
**August 2001**



**Legend**

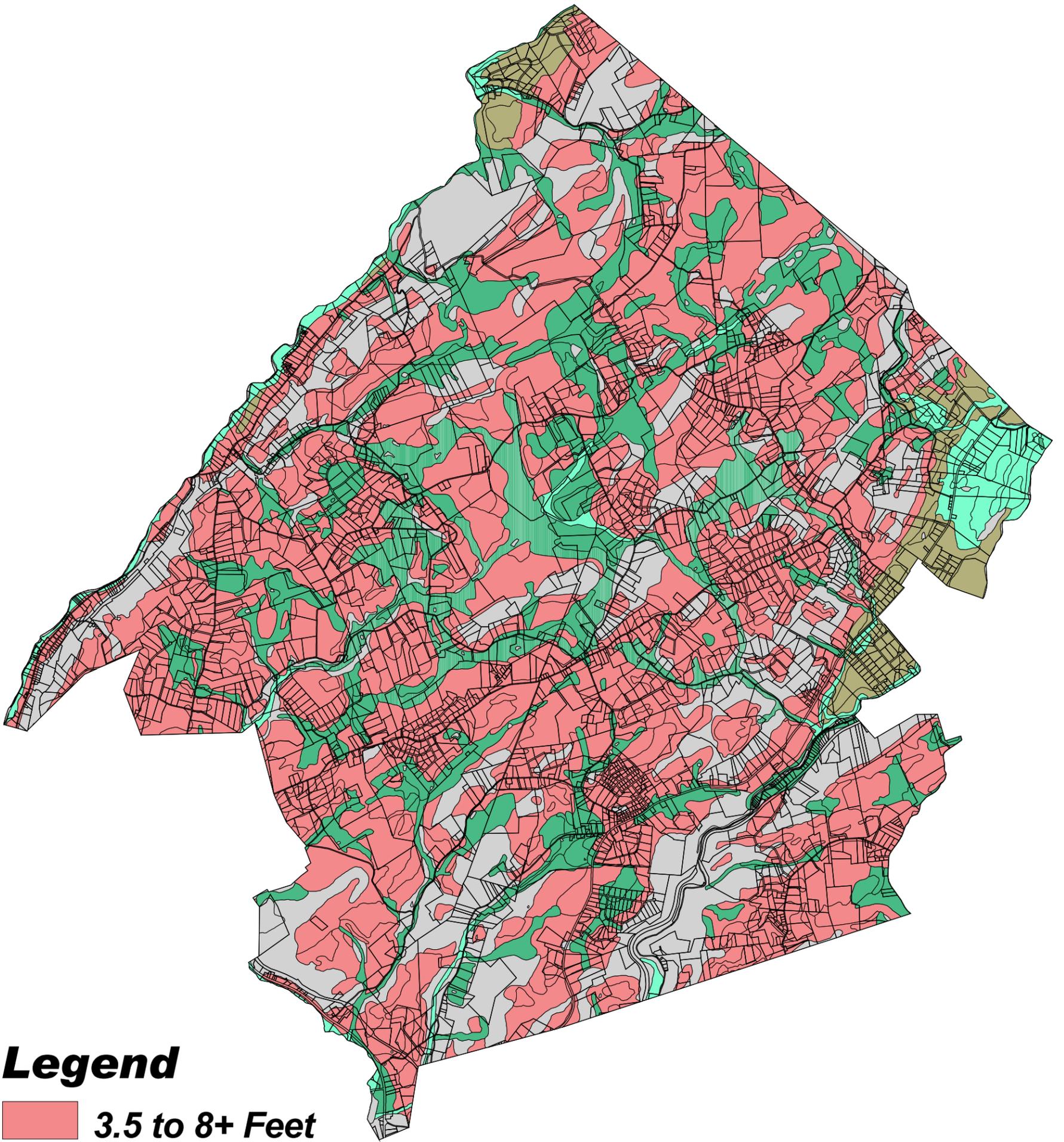
-  **0 to 1.5 Feet**
-  **0.5 to 2.5 Feet**
-  **3+ Feet**
-  **4 to 8+ Feet**
-  **Unclassified**



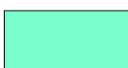
1 0 1 Miles

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Hunterdon County Soil Survey - USDA

**Figure 12**  
**Depth to Bedrock**  
**Lebanon Township**  
**August 2001**



**Legend**

-  **3.5 to 8+ Feet**
-  **4 to 7+ Feet**
-  **5 to 10+ Feet**
-  **6 to 10+ Feet**
-  **Unclassified**

1 0 1 Miles



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Hunterdon County Soil Survey - USDA

## **Review of Municipal, County and State Plans and District Solid Waste Management Plan**

The Municipal Land Use Law (MLUL) requires that a municipal Master Plan include a statement concerning the relationship of the Plan to the plans of contiguous municipalities, the master plan of the county in which the municipality is located, the State Development and Redevelopment Plan (SDRP), and the district solid waste management plan of the County (N.J.S.A. 40:55D-28d.). The purpose of this analysis is to ensure that the general welfare of adjoining municipalities, the County and the State as a whole is addressed in the local planning process. Towards this end, this review of other agency plans addresses the plans of adjoining municipalities, Hunterdon County and the State of New Jersey.

### **Plans of Contiguous Municipalities**

Lebanon Township's adjoining municipalities include Washington Township, Morris County to the northeast; Washington and Mansfield Townships, Warren County to the northwest; the Boroughs of Glen Gardner and Hampton, and the Townships of Bethlehem and Union, Hunterdon County to the southwest; Califon and High Bridge Boroughs, Hunterdon County to the south; and, Tewksbury Township and Califon Borough, Hunterdon County to the east.

#### **Washington Township, Morris County**

Lebanon Township shares its northeastern border with Washington Township along the Hunterdon/Morris County line. The common boundary with Washington Township includes several low-density residential districts with minimum lot sizes ranging from 80,000 square feet in the R-2 district to 200,000 square feet in the R-5 district, which are contiguous with Lebanon's lower density residential districts.

#### **Mansfield and Washington Townships, Warren County**

Lebanon shares a common border with Mansfield Township from Butlers Park Road to ¼ mile north of Stephensburg Road. The adjacent district in Mansfield along this border includes single-family residential with minimum lot sizes ranging from ½ acre to 1-acre, while lower density residential districts are found in Lebanon Township. South of Butlers Road to Route 31 Lebanon shares a border with Washington Township, where a majority of the adjacent district in Washington Township is Rural Residential, opposite a mixture of medium and lower density residential districts in Lebanon. This district permits low density residential on 4-acre lots. A small portion of Washington's Office Commercial district is located west of Lebanon's B-1 neighborhood commercial district.

#### **Hampton Borough, Hunterdon County**

The common boundary with Hampton Borough includes a Highway Commercial district from Route 31 to Route 645 where the district changes to the R-2 Residential district and

lot sizes of 2 acres are required for conventional single-family development. Moving south along this border the district changes to R1/2B Residential which permits high density residential on ½ acre lots, which is contiguous with Lebanon’s R1 ½ district developed to identify the higher density nodes.

Glen Gardner Borough, Hunterdon County

To the southwest, Lebanon Township abuts a small Industrial, Office and Research district in Glen Gardner Borough where the land use plan supports light manufacturing, office and research uses. South from Forge Hill Road to Route 628 the adjacent land use changes to Rural Residential (RR) where the intent of the district is to maintain the character of the surrounding area by establishing rural residential densities. The RR district in Glen Gardner Borough permits conventional single-family dwellings on 3-acre minimum lots. The districts in Glen Gardner are opposite lower density residential districts in Lebanon Township.

Moving south from Route 628 to Sanatorium Road the Township abuts the Borough’s Conservation Management district intended to maintain environmental protection and open space standards. Single family residential is permitted in harmony with the protection of natural features. The minimum lot size permitted for residential lots is 5 acres. The Conservation Management district also permits performance and cluster subdivisions with a maximum open space component and a minimum overall tract size. This district corresponds to similar districts in Lebanon Township.

The Borough includes another small Industrial, Office and Research district contiguous with Lebanon’s Industrial district before changing to Village Residential, which is intended to create a village mix of single-family and two-family homes. The average density in this district is 4 units per acre.

Bethlehem Township, Hunterdon County

The common boundary with Bethlehem Township includes a low-density mountain residential district where 3-acre minimum lots are permitted. The 1999 Master Plan Land Use Plan Element recommended that the minimum lot size be enlarged to five acres in this district. The adjoining district in Lebanon Township is highway commercial.

Union Township, Hunterdon County

Lebanon shares a common boundary with Union Township south of Route 31. The adjacent land use districts in Union Township include Watershed Management, Institutional and Parkland districts, which permits agricultural, institutional and forestry uses on lots ranging from 5 acres in the Parkland and Institutional districts to 9 acres in the Watershed Management. The Watershed Management district permits single-family dwellings on 9-acre lots. These districts are adjacent to Lebanon’s highway business district along Route 31.

### Borough of High Bridge, Hunterdon County

A small portion of Lebanon's highway business district abuts the Commercial district in the Borough of High Bridge where commercial uses not detrimental to downtown businesses are permitted. The district permits larger business uses including manufacturing, warehousing and office, which are in appropriate to the downtown area. The remaining common boundary of High Bridge Borough permits a mixture of residential densities ranging from 7,500 square feet in the R-4 district to 105,000 square feet in the R-1 district. These districts are adjacent to Lebanon's Resource Conservation district.

### Clinton Township, Hunterdon County

The majority of Lebanon's southern border, which consists of a lower density residential district, abuts Clinton Township's single-family residential (R-1) district where the minimum lot size for a single-family dwelling unit is 5 acres. Where Route 31 enters the Township the adjacent land use plan includes an office building district, which permits a broad range of development opportunities including, clubs, lodges, banks and professional office for business, administrative and professional purposes. Clinton Township's office building district abuts Lebanon Township's highway commercial district.

### Tewksbury Township, Hunterdon County

The majority of Lebanon Township's southeastern border, which include only residential districts, abuts Tewksbury Township's Rural (R-3) district where agriculture and single family dwellings are permitted on lots 3 acres or greater. Tewksbury includes two small Village Residential districts along Lebanon's border, which were established to recognize small enclaves of existing clusters of older homes. The minimum lot size for new dwellings in the Village Residential district is 1.5 acres.

### Califon Borough, Hunterdon County

The Township shares a border with Califon Borough where a variety of uses are permitted in both municipalities. The adjacent land use districts include the Highway Business district, which permits a variety of commercial, warehouse and professional office uses, and several single-family zoning districts ranging in density from minimum lots of 22,000 square feet in the medium residential district to 3 acres in the rural residential district.

In general, the plans of Lebanon Township's adjoining neighbors include a mix of residential and non-residential districts. For the most part, the character of the development and planning and zoning in adjoining municipalities conforms to that in Lebanon Township. However, where potential conflicts exist, as in cases of non-residential and abutting residential development, careful site planning and design can minimize most impacts.

### **Hunterdon County 1986 Master Plan**

In accordance with the New Jersey County and Regional Planning Act of 1968 (N.J.S.A. 40:27-2) the Hunterdon County Planning Board prepared a Master Plan for the physical development of the County, entitled the Hunterdon County Growth Management Plan, 1986. The plan recognized that Hunterdon had become one of the fastest growing counties in the state. The plan established long-term land use goals and objectives to accommodate the diverse demands for future growth in Hunterdon County while retaining the rural and historic character and environmental quality of the county. Lebanon Township's Master Plan advances these same objectives in its guiding principles. The Plan designates all of Lebanon Township as a Rural Conservation Area, which is consistent with the Township's planning approach.

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

The New Jersey State Planning Act was signed into law over fifteen years ago, providing for the first State Plan ever formally adopted with input from New Jersey's counties, municipalities, and citizens. The State Planning Act of 1985 (NJSA 52:18A-196 et. seq.) recognized the intent of the legislature to provide for sound and integrated statewide planning in order to "conserve its natural resources, revitalize its urban centers, protect the quality of its environment, and provide needed housing and adequate public services at a reasonable cost while promoting beneficial economic growth, development, and renewal...."

The State Planning Act established a process (Cross-acceptance) that invited the active participation of state agencies, and County and local governments as well as concerned citizens and private interests. Among the guiding principles of the State Planning Act are "the provision of adequate and affordable housing in reasonable proximity to places of employment" and the recognition that "the preservation of natural resources and environmental quality is vital to the quality of life in New Jersey".

The State Planning Commission, created under the State Planning Act, was empowered to effectuate its goals by promoting coordination among state agencies and local government, providing technical assistance to local governments, developing recommendations for a more efficient and effective planning process and recommending to the Governor and Legislature such actions as would improve the efficiency or effectiveness of the planning process.

The Cross-acceptance process is a collaborative, participatory process by which state agencies and local governments join in statewide planning to achieve full public participation in the process and a consensus among all levels of government. For this reason, the State Development and Redevelopment Plan (SDRP) carries with it the weight of a long and detailed process of comparison of planning goals, negotiation of differences, and resolution of issues, allowing for a coordinated set of public policies which resonate around central themes. Additionally, N.J.S.A. 40:55D-28 (d) requires that municipal master

plans include a statement indicating the relationship of the municipal master plan to the SDRP.

On March 1, 2001, the State Planning Commission adopted the Final State Plan. This document represents modifications that came about during cross-acceptance of the Preliminary State Development and Redevelopment Plan, which began in 1997 and came to a close in 1999.

While some of the policies and mapping in the Plan have changed, many have remained the same. What has also remained the same is the classification system that the State Planning Commission has used to map the entire State into appropriate "Planning Areas". The Planning Areas for Lebanon Township are shown on Figure 14.

Lebanon Township includes two Planning Area designations and a small area designated as Park, as identified in the State Plan Policy Map in the Final State Plan. They are Planning Area 4B, Rural/Environmentally Sensitive, and Planning Area 5, Environmentally Sensitive and Parkland.

The significance of these Planning Area designations and the State Plan itself have been largely ceremonial to date, with no regulatory authority backing either. However, the State Plan has gained more clout as a regulatory tool amongst State agencies themselves over the past couple of years. Many state funding sources and discretionary awards have had State Plan compliance requirements built in, making use of the State Plan and its policies more attractive to municipalities throughout New Jersey.

Planning Area 4B represents lands in the State that have environmentally sensitive features, yet still possess agriculturally productive soils or may have a prevalence of farming as an industry. This is the case over most of the Township, which possesses unique forest resources that provide contiguous habitat for many threatened or endangered species, yet also possesses a number of viable farms or agriculturally based businesses. The challenge in this Planning Area is the continuation of agriculture as a viable business, through continued funding of farmland preservation efforts, while balancing environmental resource protection.

Planning Area 5 possesses many of the State's significant environmental resources, yet lacks the farming and productive soils found in Planning Area 4B. It is comprised mainly of land that has wetlands, forests, and steep slopes, yet may also possess scenic views and other valuable qualities as well. The portion of the Township that is categorized as Planning Area 5 is found in both the northern and southern areas.

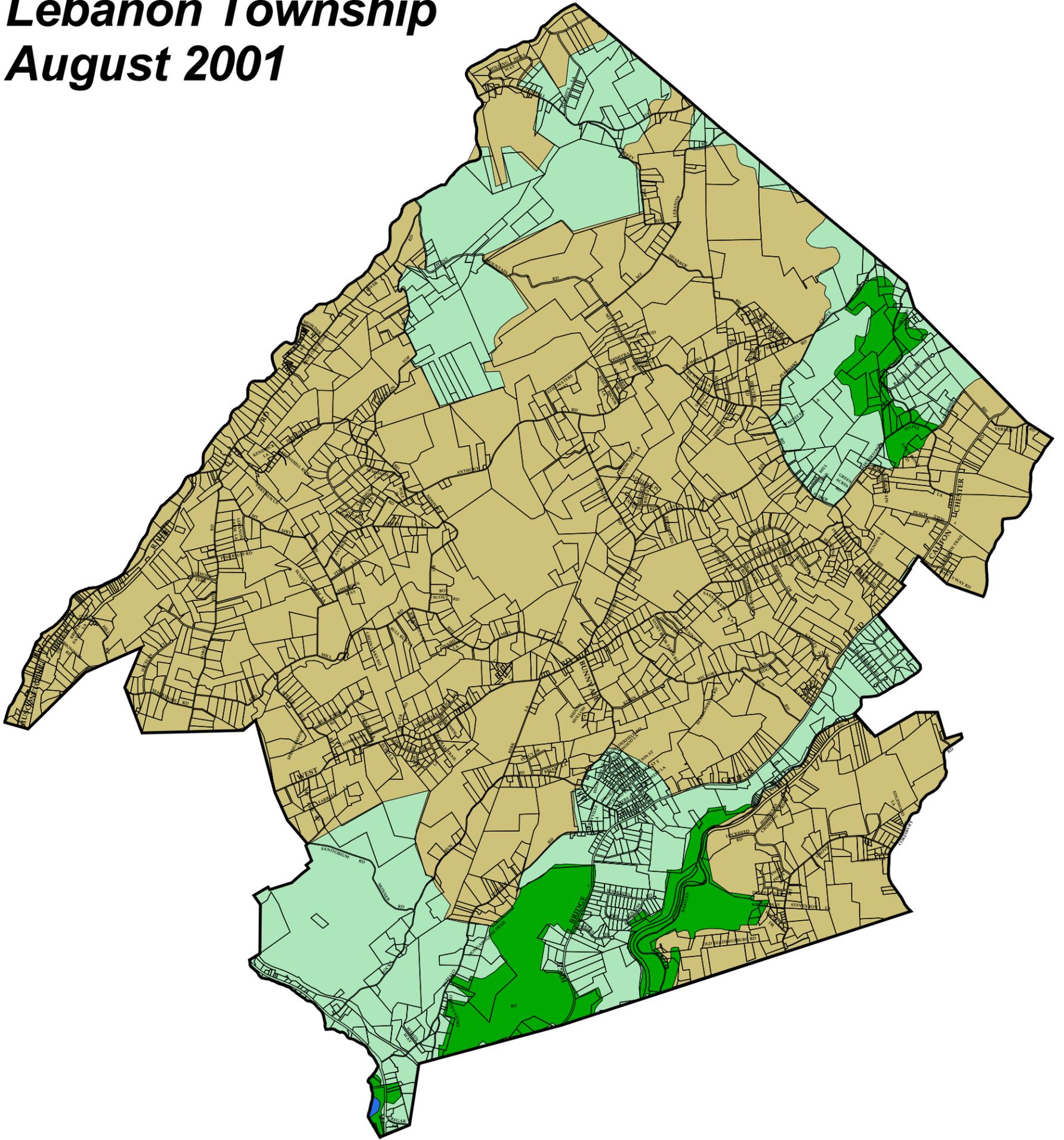
Lebanon Township's Land Use Plan evolved in response to the Cross-acceptance process and State Development and Redevelopment Plan. Lebanon officials participated in Cross-acceptance in order to assess the implications of the basic principles which guide the State Plan. The goals of the Township's Master Plan, which articulate the Township's vision for its future, have been formulated in response to these basic principles.

# Figure 14

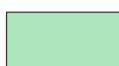
## Planning Areas

### Lebanon Township

#### August 2001



### Legend

-  **Park**
-  **Water**
-  **PA-4B (Rural and Environmentally Sensitive Planning Area)**
-  **PA-5 (Environmentally Sensitive Planning Area)**

1 0 1 2 Miles



"This map was developed using NJDEP Geographical Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized."

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 NJ Office of State Planning  
 NJDEP

Significantly, under the adopted SDRP, nearly 72% of the land in the Lebanon Township is classified PA-4B while the remaining 23% is classified PA-5 and 5% classified as Park.

The Rural/Environmentally Sensitive Planning Area (PA 4B) is characterized in the State Plan by:

- land currently in agriculture or natural resource production, or having a strong potential for production based on soil productivity for agriculture
- undeveloped wooded tracts, vacant lands and large contiguous tracts of agricultural lands, and other areas outside Centers predominantly served by rural two lane roads and individual wells and septic systems.

The intent of the SDRP for PA 4B seeks to:

- Maintain the Environs as large contiguous areas of farmland and other lands;
- Revitalize cities and towns;
- Accommodate growth in Centers;
- Promote a viable agricultural industry;
- Protect the character of existing, stable communities; and
- Confine programmed sewers and public water services to Centers.

The Environmentally Sensitive Planning Area (PA 5) is characterized in the State Plan by:

- high quality surface waters and their watersheds
- watersheds of potable water supply sources
- aquifer recharge areas
- valuable ecosystems and habitat for threatened and endangered species
- contiguous freshwater wetlands systems
- significant natural features or landscapes, including critical slope areas, ridge lines, important geological features and unique ecosystems.
- prime forested areas

The SDRP cites PA 5 as “highly vulnerable to damage of many sorts from new development...including fragmentation of landscapes, degradation of aquifers and potable water, habitat destruction, extinction of plant and animal species and destruction of other irreplaceable resources .” These environmental sensitivities prompted concern in the SDRP that “new development (in PA 5) has the potential to destroy the very characteristics that define the area.”

The intent of the SDRP for PA 5 seeks to:

- protect environmental resources through the protection of large contiguous areas of land
- accommodate growth in Centers
- protect the character of existing stable communities
- confine sewers and programmed water services to centers
- revitalize cities and towns

According to the SDRP, these areas, along with Planning Area 5, “are not currently nor are they intended to be urban or suburban”. The State Plan recommends protecting the rural character of the area by encouraging a pattern of development that is supportive of agriculture and other related economic development efforts that promote a stronger rural economy in the future while meeting the immediate needs of rural residents, and by identifying and preserving farmland and other open lands. The Plan also promotes policies that can protect and enhance the rural economy and agricultural industry, thereby maintaining a rural environment while also protecting valuable ecosystems or wildlife habitats.

The State Plan emphasizes that growth should be organized within existing or planned centers, and that the Environs, outlying areas of lower development intensity outside centers, should be protected from suburban sprawl. The State Plan does not include any designated centers in Lebanon, however, the list of proposed centers includes Long Valley, Penwell, New Hampton, Bunnvale and Woodglen.

In order to accommodate State Plan goals for both the Environs and central places, development needs to be realigned along smart growth principles. A push-pull relationship should evolve where growth is directed away from the Environs and into the cities and older suburbs, where redevelopment opportunities abound. The redevelopment vision of the State Plan cannot be realized unless the economic force behind sprawl is redirected toward these redevelopment opportunities.

The State Plan vision for New Jersey in 2020 sees diverse and thriving cities and towns with a desirable quality of life where reinvestment and public/private partnerships have reclaimed brownfield sites. At the same time, this 2020 vision foresees rural areas where limited growth has been accommodated “while maintaining the rural character and large contiguous areas of farmland so important to all the citizens of New Jersey” and where “farmland and other open lands have been preserved to ensure the future viability of agriculture and maintain a rural environment.”

The State Plan is not mandatory; however, it is a comprehensive guide to land use planning for a better New Jersey built upon an inclusive cross-acceptance process, and the ultimate success of the endeavor is largely in municipal hands. Lebanon Township has incorporated local policies and strategies that respond to the basic premises, intent and purposes of the State Plan.

### **District Solid Waste Management Plan**

Hunterdon County has adopted a Solid Waste Management Plan in accordance with the requirements of the State “Solid Waste Management Act”. The Solid Waste Management Act established a comprehensive system for the regulation of solid waste collection, recycling and disposal. The Act authorizes Counties to develop and implement comprehensive solid waste management plans which meet the need of municipalities within the County.

In accordance with the County's Solid Waste Management Plan, curbside recycling occurs every two weeks, and residents can contract with private waste hauling companies for more frequent collections. Once a month the Township Municipal Building serves as a depot for recycling drop-offs. The Township also participates in hazardous waste collections, phone book recycling, used motor oil recycling and tree chipping programs. General solid waste collection is handled by private waste haulers on a contractual basis with individual property owners.

The development proposed in the Lebanon Township Master Plan is consistent with the intent of the District Solid Waste Management Plan in terms of recycling, solid waste collection and solid waste disposal and complies with all applicable state laws.

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