

Architecture Planning Landscape Architecture

# 2009 Amendment To the Master Plan

Readington Township, Hunterdon County, New Jersey

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### Statement of Objectives, Principles, Assumptions, Policies, and Standards

Land Use Plan

**Conservation and Natural Resources Plan** 

**Utility Service Plan** 

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## Township of Readington 509 County Route 523 Whitehouse Station, New Jersey 08889

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### Introduction

Readington Township last adopted a complete comprehensive Master Plan in 1990. Since that time, numerous revisions have been made to individual Plan Elements, including incremental updates to the Land Use Plan, Conservation and Natural Resources Plan, Circulation Plan, Parks, Recreation, and Open Space Plan, and Housing Plan, notably in 1998, 2000, 2001, 2002, and 2008. This amendment to the Master Plan of Readington Township consists of a Statement of Objectives, Principles, Assumptions, Policies, and Standards, Land Use Plan, Conservation Plan, and Utility Service Plan. It compiles past revisions and adds updated information to form new complete elements as described herein.

The Statement of Objectives, Principles, Assumptions, Policies, and Standards updates and revises the Statement contained in 1990 Master Plan as well as compiles the various revisions made since that time. The Land Use Plan Element replaces the Element contained in the 1990 Master Plan and compiles and updates the amendments made in 1998, 2000, and 2002. The Conservation, Natural Resources & Agriculture Plan, last amended in 2002, is being separated into two distinct elements- a Farmland Preservation Plan (adopted in 2007) and a Conservation Plan Element contained in this amendment. The Utility Service Plan Element contained in this amendment will replace the Utilities Element in the 1990 Master Plan.

It is the intent of the Planning Board that this amendment shall supersede the 1990 Master Plan and any subsequent amendments in the event of any inconsistencies which may exist among these documents.



# Statement of Objectives, Principles, Assumptions, Policies, and Standards

The basic goal of this Master Plan is to establish reasonable objectives which will provide a balance between farming, open space preservation and appropriate residential and commercial development with regard to the community's highways, facilities and services, natural features, existing development characteristics, and available land. Within this framework, the following specific goals and policies are established for Readington Township. These goals and policies represent an update of and amendment to those contained in the 1990 Master Plan, including all subsequent amendments:

### 1. AGRICULTURAL PRESERVATION

#### Goal:

Preserve farmlands and encourage their continued use recognizing that farming is an important component of the economy of the Township, the region, and the State, and that agricultural lands are an irreplaceable natural resource and a key element of the Township's rural character.

### **Policies:**

Coordinate local agricultural land use preservation efforts with those of the State and the County and with those of adjoining municipalities.

Preserve large agricultural areas free from the intrusion of residential and other uses by zoning for appropriate intensity of use, requiring that new residential units in agricultural areas be clustered and by acquiring development rights and open space in agricultural areas.

### 2. ENVIRONMENTAL PROTECTION

#### Goal:

Protect environmentally sensitive areas, preserve the natural environment, and ensure a compatible balance between economic and environmental interests.

#### **Policies**:

Conserve and protect environmentally sensitive areas. To that end (i); continue to require new development to observe rigorous performance standards to minimize any potential adverse environmental effects; and (ii) relate development standards and the permitted intensity of use to the carrying



capacity of the soil and groundwater quality and to the objective of preserving farmland, open space and natural features.

Encourage the development of a Township-wide "greenbelt" system, incorporating natural areas, stream corridors, environmentally sensitive areas and areas of scenic beauty, in order to connect various parts of the Township through an open space network. It is recommended that the Township sponsor studies to identify the areas that should be preserved.

Promote energy conservation through the use of planning practices designed to reduce energy consumption and provide for maximum utilization of renewable resources.

Actively conserve and protect the biodiversity of the flora and fauna in the region including critical wildlife habitats, such as mature woodlands, grasslands, wetlands and stream corridors, through various mechanisms of open space preservation, including land acquisition.

Lands identified as containing critical wildlife habitat, threatened and endangered flora, or Natural Heritage Priority Sites should be considered the highest priority sites for preservation.

Educate the public regarding environmental protection and natural resources.

Protect and preserve the scenic viewsheds and scenic edges of public thoroughfares through the classification, location and configuration of land uses.

Protect groundwater quality by meeting or exceeding NJDEP standards for nitrate dilution in groundwater for each watershed in the Township.

Protect surface water quality by minimizing erosion, maximizing infiltration of stormwater, and prompting development practices that will not negatively affect water temperature and turbidity.



#### 3. **RESIDENTIAL DEVELOPMENT**

#### Goal:

Preserve the existing housing stock and provide the opportunity for the development of a wide variety of housing types to meet the needs of varied income and age levels, family compositions, and life styles.

#### **Policies:**

Increase the opportunities for households to obtain satisfactory housing at affordable prices through use of planned development and clustering techniques where appropriate.

Investigate alternate forms of residential clustering that promote, at selected locations served by public sewer & water, compact residential clusters maximizing the amount of common open space to be achieved.

Meet the housing needs of a wide range of income and age levels, with particular attention being paid to accommodating the Township's affordable housing obligation, by providing varied housing types at varying residential densities dispersed throughout the Township in appropriate locations with pedestrian access to services.

Encourage the construction of affordable housing which does not create an adverse impact on the public health, safety and general welfare of the Township or on future residents of the development.

### 4. ECONOMIC DEVELOPMENT

#### Goal:

Encourage development of industrial, office, research, commercial, and service uses, selected and regulated so as to preclude land use incompatibilities and in an amount that would increase the tax base which supports the local government and the public school system without disturbing the fragile residential-agricultural balance in the rest of the Township or negatively impacting traffic circulation.

#### **Policies:**

Encourage well designed retail and service uses that blend harmoniously with the Township's rural character with appropriate access from major arteries and



in an amount not in excess of that needed to satisfy the commercial demands of local residents and businesses.

Maintain strict performance standards for the development of industrial, office, research or commercial uses such that development compatible with the environment will be assured.

Encourage retention of farmland and agriculture, to the extent practical, adding diversity to the Township's economic and local job base.

#### 5. CIRCULATION

#### Goal:

The encouragement of transportation routes and traffic controls designed to promote the free and coordinated flow of traffic, and discouragement of facilities and routes which would result in congestion or blight.

#### **Polices:**

Encourage the channelization of traffic onto appropriate facilities in a manner which produces a minimum detriment to residential or non-residential areas.

Continue to accommodate traffic from approved new land development projects while maintaining existing levels-of-service and without negatively affecting rural character.

Encourage the use of public transportation and mass transit. Support existing and potential park-and-ride and kiss-and-ride facilities in the Township.

Ensure preservation of the Solberg-Hunterdon Airport as a public aviation facility.

Identify roadways with scenic and rural character for preservation and protection

Encourage pedestrian and bicycle transportation throughout the Township.



#### 6. COMMUNITY FACILITIES/AND RECREATION

#### Goal:

Ensure the provision of community recreation and educational facilities to adequately accommodate Township needs.

### **Policies:**

Encourage location of new public facilities in appropriate locations in and around centers. Also promote cooperative use of school facilities for recreational and community activities to the extent practicable.

Continue the creation of local park and recreation systems distributed and designed to provide a variety of open space uses. Encourage and develop passive recreation opportunities.

Promote the development of a Township-wide "greenbelt" network which includes major environmentally sensitive areas and enables creation of natural buffers and linkages between development areas as well as parks and public facilities.

Provide adequate public safety service (police, fire, rescue squad) with appropriate facilities, manpower and equipment distributed according to development patterns.

### 7. UTILITIES

#### Goals:

Balance development with sewer capacity and water supply

#### **Policies:**

Sewer Service Areas within the Township should reflect available treatment capacity. Reserve any excess sewer capacity for affordable housing in satisfaction of the Township's fair share obligation.

Protect groundwater and surface water quality by ensuring that the Township meet or exceed the NJDEP standard for nitrate dilution in areas that rely on septic disposal systems outside of sewer service areas.



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#### HISTORIC PRESERVATION

#### Goal:

Preserve and protect sites and villages of significant historic interest for present and future generations to appreciate and enjoy.

#### **Policies:**

Encourage the preservation and restoration of structures and villages of significant historic interest.

Continue the nomination of significant structures and villages for inclusion on the State and National Register of Historic Places.

Encourage appreciation of the rich history of Readington Township and of the architecture of significant structures.

#### 9. RECYCLING

#### Goal:

Ensure the recycling of materials within the township is in compliance with the New Jersey Mandatory Source Separation and Recycling Act (N.J.S.A. 13-1E-1 et seq.).

#### **Policies:**

Establish and enforce Township and State regulations on the recycling of materials.

Provide for the collection of recyclable materials and increase the types of items to be collected.

Increase awareness of recycling rules and regulations through education and outreach to residents and businesses.



### Land Use Plan Element

#### Introduction

This Land Use Plan Element seeks to promote the goals and objectives of the Master Plan for the conservation, development and redevelopment of land within the Township. The Land Use Plan Element synthesizes the policies and recommendations found in the other elements and statements in this document. The Land Use Plan is designed to encourage compatible land uses, the restriction of development on environmentally sensitive lands, and the careful management of growth and preservation on the remaining land. This Master Plan is a continuation of earlier efforts to manage the direction of growth, preservation and development.

Readington Township was settled in the early 18<sup>th</sup> century as a farming community and remained predominantly agriculturally–oriented for 250 years. The village of Three Bridges in the south, along the South Branch of the Raritan River and a handful of other crossroads hamlets emerged from amongst the farmland over the years. Potterstown and Readington are two of the oldest settlements in the area. In 1847 the railroad arrived and spawned a village around the station at Whitehouse.

After the Second World War and with the improvement of the major arterial systems (most notably Routes 22 and 202) the Township began to show tangible signs of change. Highway-oriented business uses began to occupy sites along Route 22 and the pace of single family residential construction began to accelerate. However, residential development was still generally nestled near the established villages or the Route 22/28 corridor. This development pattern permitted farming to continue virtually unimpeded in the vast interior of the Township (the area between Routes 22 and 202).

In the 1970s and 1980s, development pressures increased dramatically in Readington. The final completion of Interstate 78 in 1989 with an interchange at County Route 523 along with improvements to Routes 22, 202 and 31, made the Township widely accessible. Its rural character and rolling landscape made it a desirable location to live and work. As a result, the residential development pattern began to shift from the traditional pattern described above towards a more conventional subdivision approach. These subdivisions were comprised of generally large single family homes on 1.75 to 2 acre lots utilizing wells and on-site septic systems. Substantial areas of farmland within the Township were consumed by rural residential subdivisions.

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It was also at this time that large scale planned development was constructed at Lake Cushetunk and near Three Bridges. Between Hunter's Crossing, Whitehouse Estates, Van Horne Mill at Cushetunk Lake, and Cushetunk Commons, a total of 1,400 units were created from the late 1980s through the mid 1990s.

The swift pace of residential development in Readington continued during the 1990s. From 1990 through 2000, over 1,200 units were added to the Township's housing stock (a growth rate of approximately 25%). While a significant number of these new units were located in the Planned Neighborhood Development district, substantial acreage within the Rural Residential district was also being consumed by residential subdivisions. This growth was also reflected in the loss of land under farmland assessment which declined by 2,077 acres (from 16,519 acres to 14,442 acres) between 1982 and 1998.

The Township reacted to this trend with a concerted effort to preserve farmland and open space. Beginning with the 1990 Master Plan the Township set forth its intent to preserve farmland, particularly in areas where large parcels in agricultural use predominate. It also identified the carrying capacity of the soil and preservation of environmental features as key indices for gauging the appropriate intensity of residential use.

The 1998 Master Plan Amendment brought intensified focus to these issues through the creation of a new land use designation, termed Agricultural Residential (AR). The Agricultural Residential land use category provided for larger minimum lot sizes for conventional subdivisions and greater open space/agricultural set-asides within clustered subdivisions than the former Rural Residential (RR) category. The 1998 changes were coincidental with the 1998 NJ Preservation Bond Act which designated funding for open space and farmland preservation for a 10 year period.

A key strategy employed by the Township to preserve land has been to permit "cluster" subdivisions in the RR, SSR, and AR land use categories. This zoning technique allows for smaller lot sizes (1.5-2 acres), but requires set-asides of preserved land. The Township first required mandatory clustering in 1988 for areas within the Agricultural Development Area (ADA). With the introduction of the AR land use category in 1998, mandatory clustering was continued for tracts of land 40 acres in size or greater. In 2002 the Land Use plan was further amended to expand the AR district in order to better align the plan with existing agricultural and open space land uses.

Through this technique and the targeted use of State, County, and local funds, Readington has had great success in preserving land for farmland and open space. As of

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2009 there were a total of 1,959 acres of municipal open space, 686 acres of County open space and 873 acres of State open space, for a total of 3,518 acres of preserved open space within the Township. There were also a total of 65 farms comprising 4,560 acres that have been permanently deed restricted. In all, this means that a total of 26% of the Township's land mass is dedicated open space, parkland or preserved farmland.

The pace of development in the years immediately after 2000 slowed considerably; however, development pressure remained. Perhaps the most notable projects during this time were within the senior residential land use categories. The Township identified a need to provide for age-restricted housing beginning in the 1990s and adopted an amendment to the land use plan in 2000 that identified potential locations and types of senior housing. New age-restricted housing zones were subsequently adopted at the end of that year. The Township finally saw interest from developers in providing this housing type during the beginning of the current decade. The Country Classics age-restricted development at the Hogan tract, approved in 2004, consists of 51 apartment units. The Renaissance at Readington development on Route 22, approved in 2005, will contain 73 single family homes and 137 townhouses.

At the present time development is continuing, albeit at a slower pace than in the 1990's and the early part this decade. This can be attributed to the reduction in available developable land, larger economic conditions, and the Township's land use and land preservation efforts. Recent development has trended toward small residential subdivisions, non-residential projects, and redevelopment. These include day-care centers and mixed-use proposals that contain affordable housing. The Township's ordinance that reserves available sewer capacity in the Readington Whitehouse Sewer Service Area for those projects with an affordable housing component has been effective in drawing developer interest. In March 2009, the Planning Board adopted a Reexamination Report that made numerous recommendations for changes to the land use plan in response to these recent trends and in light of new State regulations regarding water quality and wastewater management and the release of revised habitat data. Those recommendations are contained in this revision to the land use plan element.

The extent of existing sewer capacity and ability of unsewered areas to accommodate additional septic systems and still meet NJDEP nitrate dilution standards requires that the Township take a fresh look at the permitted densities in the residential and non-residential areas of the Township.

Recently updated species habitat information, available through the release of revised NJDEP Landscapes Project Habitat Data, reveals that large areas of the Township



contain critical habitat for threatened and endangered species. The Landscapes Project data was not available when the last comprehensive review of land use was undertaken in 1998.

Based on these factors, this master plan recommends changes to expand the Agricultural Residential zoning district and decrease permitted residential densities in order to comply with NJDEP standards for nitrate dilution in unsewered areas. This master plan also recommends the creation of two new residential zoning districts – the Special Resource Residential (SRR) district and the Hamlet Residential (HR) District. The Special Resource Residential District will replace the Steep Slope Residential (SSR) district and be expanded to encompass areas that contain concentrations of regulated environmental resources as well as critical habitat areas, generally, outside of the Agricultural Development Area. The Hamlet Residential (HR) district is being created for the hamlets of Stanton and Readington to reflect existing conditions and to ensure the preservation of the existing character in those areas.

The Township has noted a trend of churches and houses of worship occupying larger physical spaces that can accommodate larger gatherings of people. This has made these and other assembly uses increasingly incompatible with residential land uses. Based on this trend this master plan revaluates assembly uses like houses of worship, fraternal organizations, and clubs and recommends that all assembly uses be regulated similarly and that they only be permitted in areas of the Township with adequate access, away from predominantly residential areas. Specifically, they should be conditionally permitted in the B, PO, RO, ROM-I and ROM-2 districts.

Recent nonresidential development along Route 22 has continued to occur in a haphazard fashion in isolated pockets along the corridor. The character of the highway does not reflect the historic character of the nearby villages or the rural character of the Township. However, the lands on the periphery of the corridor have retained much of their rural character. This is primarily because these lands have not utilized their full development potential. Should Route 22 continue to be built out in accordance with the existing land use regulations, this undesirable development trend is expected to continue.

The Township has examined the corridor and considered a variety of measures in order to curtail further isolated highway-oriented commercial development along Route 22 and concentrate commercial development in a series of nodes, most notably, at the Route 523 intersection. The central goal for Route 22 is to promote center-based development radiating from Whitehouse and Whitehouse Station, while decreasing permitted development intensities at the periphery of these areas. This strategy also

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supports the Township goal of lowering permitted densities outside of sewer service area to more closely reflect the actual development potential of lots utilizing individual septic disposal beds. These goals will be implemented through zoning changes including the creation of two new districts, the Professional Office (PO) and Village Hospitality (VH) district as well as revisions to the existing zoning district boundaries along the Route 22 corridor and in the villages of Whitehouse and Whitehouse Station.

### **Existing Land Use**

#### Land Use Categories

This section describes how land is currently being used in the Township in contrast to how it is regulated. Analyzing existing patterns of land use is a necessary first step in determining how well current zoning is implementing the goals and objectives of the Master Plan and where changes might be required to improve this implementation. Accordingly, a map of existing land use within the Township has been created utilizing property tax records, aerial photography, and selective field investigation. The existing land use plan geographically divides Readington into ten different land use categories. The existing land use categories are described below:

SINGLE-FAMILY DETACHED RESIDENTIAL – This category consists of detached housing occupied by a single household. This category constitutes about 97 percent of the land area devoted to housing in Readington and 33 percent (9,722 acres) of all land in the Township. Single family residential uses are distributed throughout the Township, with concentrations located in the historic villages of Whitehouse Station, Whitehouse, and Three Bridges. Approximately 83 percent of the housing units in Readington are single family detached dwellings.

TWO-FAMILY AND GREATER RESIDENTIAL – This category comprises all other residential units in the Township including semi-detached (houses that are attached, having one party wall common to another house), townhouses (single-family attached residences), and apartments (multi-family housing developments such as garden apartments). This category comprises the remaining 3% of the land area devoted to housing and occupies 1% (268 acres) of the Township's total land area. These units comprise approximately 17 percent of all housing units in the Township The largest concentration of attached and semi-detached housing is located near the Route 22 Corridor in Lake Cushetunk Woods, Whitehouse Village Estates, Four Seasons at Readington, Country Classics, and the Fallone at Spring Creek (Renaissance) Property (approved). The Hunters Crossing

Townhouses on Route 202 is the only other non-single-family detached development in the Township.

PUBLIC/QUASI-PUBLIC/UTILITY – The Public classification refers to governmental uses. Accordingly, it includes municipal offices and facilities, sewage treatment or storm water management uses, and schools. It also includes nonprofit community facilities, and recreational facilities that have a widespread local membership but are not public facilities. This category may be contrasted with State, County, and Township-owned land used or intended for recreational or conservation purposes. In that circumstance it has been categorized as Preserved Open Space category rather than public. This category occupies 1.7% (512 acres) of the Township's land area.

CHURCH/CEMETERY – This category includes religious institutions and cemeteries and makes up 0.3% (86 acres) of the Township's land area.

COMMERCIAL/OFFICE – This category includes retail sales and services such as stores, restaurants and entertainment. It also comprises services provided to households and businesses. The Commercial/Office category contains professional, business, and general administrative offices. However, where offices are operated as part of a distribution or manufacturing facility, they have been placed in the Industrial category. Readington's largest concentration of commercial uses is along Route 22. The largest concentration of office uses is along Route 523, north of Route 22 where Merck has their worldwide headquarters. 4.9% (I,45I acres) of the Township's land area is devoted to commercial/office uses.

INDUSTRIAL – This category encompasses manufacturing, assembly, distribution, warehousing, research and development, and office uses related those facilities. The largest concentration of industrial uses in the Township is near County Line Road in the Tannery Road Industrial Park. 0.6% (172 acres) of the Township's land area is devoted to industrial or manufacturing uses.

FARM/AGRICULTURAL – Areas that are tilled and growing field crops as well as wooded parcels that are formally assessed as farms have been included in this category. The agricultural category also includes areas utilized for raising livestock, and horse breeding and stabling. The largest concentrations of agricultural land are found in the southern, southeastern, and northeastern portions of the Township. However there are large farm parcels located throughout Readington. 39.5% of the Township's land area (11,642 acres) is currently devoted to agriculture or silvaculture.

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PRESERVED OPEN SPACE/RECREATION- Open space designates land held by the Township or another government for active and passive recreation or conservation purposes. It also includes private land that has been deed restricted as open space and private golf courses. In Readington, aside from the municipal government, the DEP and Hunterdon County have significant open space land holdings. This category comprises 16.5% (4,848 acres) of the land in the Township

RAILROAD – This category identifies land used for railroads and railroad rights-of-way. 0.3% (93 acres ) of the land in Township is occupied by railroads.

VACANT/WOODED – Vacant land is open or wooded land with no discernible use and assessed for tax purposes as vacant land. This contrasts with lands used for agriculture that may on inspection seem vacant, but are farmland assessed. 2.2% (633 acres) of the Township is characterized as vacant by the tax assessor.

The Township contains approximately 29,428 acres, or 46.0 square miles. The acreage of the existing land use categories is depicted in the following table.

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#### Table LU-1. Existing Land Use by Tax Class<sup>1</sup>

Existing Land Use	Acreage	% of Total Acreage
Single Family Detached Residential	9,721.9	33.0
Two Family and Greater Residential	268.3	I.O
Public/Utility	512.0	I.7
Church/Cemetery	86.9	0.3
Commercial/Office	1,450.6	4.9
Manufacturing/Industrial	172.3	0.6
Agricultural	11,641.9	39.6
Open Space/Recreation	4,848.3	16.5
Railroad	92.9	0.3
Vacant/Wooded (does not include agriculture)	633.3	2.2
Total	29,427.8*	100.0%

\*Approximately 2.0 square miles of land not included in the table is comprised of roadways and public rights-of-way.

As the table indicates, agriculture is the largest land use in the Township. Single family detached residences, however, are a close second; indicating that, without the preservation efforts that the Township has undertaken, it could quickly overtake agriculture for the top position. Open space/Recreation represents the third largest land use followed by commercial/office uses, vacant land, public uses, and two family and greater residential. This pattern represents Readington's strong heritage as a rural and agricultural community as well as the rapid increases in residential development that have occurred over the last thirty years. The most notable aspect of the existing land use is the large amount of land that is devoted to agricultural uses. Almost 40% of the land in the Township falls into this category. While some of this land has been preserved, 61.5% of it remains, technically, available for development, subject to existing zoning. However, as will be discussed later, much of this land is environmentally constrained and/or contains areas of critical habitat. In addition, the NJDEP rules governing the

<sup>&</sup>lt;sup>1</sup> *Sources:* 2008 Readington MOD IV Tax Assessment Records, 2007 aerial photography and field investigation.



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ability of this land to accommodate new septic systems have been revised. This presents the Township with crucial decisions to make to determine how to balance additional growth with natural resource preservation and the environmental carrying capacity of the land.



# **Existing Land Use by Property Class**

Readington Township, Hunterdon County, NJ June 2009



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### Land Use Designations

The following land use categories represent a set of recommendations for the use and development of property in Readington. The land use categories are intended to set overall land use policy for the Township. The land use categories set density limits for residential development and floor area limits for non-residential development

The following are descriptions of the land use designations used for the Readington Township Land Use Plan:

#### Special Resource Residential - SRR (I d.u./10 acre lot)

The Special Resource Residential (SRR) district is being introduced to expand the focus on protection of critical environmental features beyond steep slopes. Accordingly, this district will replace the Steep Slope Residential (SSR) zone and be expanded to include lands with concentrations of critical environmental features as well as critical habitat areas (defined as Ranks 3, 4, and 5 in the NJDEP landscapes project), generally, outside of the Agricultural Development Area (ADA).

Overall, the area within the SRR district is chiefly characterized by steep and/or heavily wooded terrain. The primary development type consists of unplanned, single-family dwellings on larger lots; the average lot size in the SRR district, at 11.7 acres, is larger than in the rest of Township. Although several agricultural properties are located within the district, the majority of actively cultivated lands are located outside of the SRR area.

While limiting the intensity of development in areas with steep topography is still a priority, the Township wishes to extend protection to other critical features including woodlands, land within and adjacent to the regulatory flood plain, wetlands, and stream corridors. In addition to lands within the existing SSR district the SRR district will be mapped in areas that are within the regulatory flood plain of the South Branch of the Raritan along the Township's border with Hillsborough and Raritan Townships and on lands within the regulatory flood plain for the Rockaway Creek, north of Route 22. Both of these waterways are classified as Category-I (the most restrictive designation) by the NJDEP for all or a portion of their length in Readington Township. In addition, the Township recognizes that lands containing critical habitat have been increasingly fragmented and lost due to traditional patterns of residential development, thus greatly reducing or eliminating their value to threatened and endangered species. Accordingly, this plan will also map the SRR district on lands categorized as Ranks 3, 4, and 5 in the NJDEP Landscapes Project habitat data that are not being used a part of an active

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agriculture operation, however some parcels with active agriculture are also being included because they adjoin or are surrounded by other parcels with critical habitat. The intent is to preserve the existing large, contiguous expanses of habitat found in these areas. This is primarily in the vicinity of Cushetunk and Round Mountains, as well as lands north of Interstate 78. It should be noted that many of the lands with environmental constraints also contain critical habitat areas, further supporting the policy of preservation and reduced density for these areas.

The SRR zoning district will permit single family homes on 10 acre lots. This is an increase from the five acre lots that were permitted under the steep slope residential district. The permitted FAR in the SRR district will be decreased to 0.02 from 0.04. The Township should also consider enacting appropriate impervious coverage limits in the SRR zone that will help to limit stormwater runoff and aid in the protection of surface water quality. These changes are being made in order to reduce the potential for ecological problems inherent in more intense development, to minimize adverse ecological effects (such as soil erosion and loss of vegetation) due to construction, and to prevent the fragmentation of critical habitat areas. This district will have the lowest density residential development in the Township. It is intended that development be concentrated in areas that would have the least disturbance to critical features or habitat. To this end the clustering of lots with a minimum size of 2 acres will now be required on tracts of land 30 acres and greater. The open space set aside is being increased to 80% of the tract area. In addition, agricultural and active recreation uses will no longer be permitted in dedicated open space areas of clustered subdivisions. Only passive recreation or conservation activities will be permitted in open space areas. ECHO housing will be permitted as a conditional use in the SRR zone.

#### Agricultural Residential – AR (1 d.u./ 8 acre lot)

The area within the Agricultural Residential (AR) land use category is comprised of large farm parcels and numerous single-family residential subdivisions beyond the more developed Route 22/Whitehouse corridor. The overall character of this district is distinctly agricultural and rural and these lands serve as the environs for the more densely settled villages within the Township. Numerous important stream corridors like the Pleasant Run and Rockaway Creek traverse the area and contain critical habitat areas for threatened and endangered species.

The land use plan is recommending changes to the Agricultural Residential District that will expand its boundaries and reduce the permitted density of development. The Agricultural Residential land use category will be expanded to include lands beyond the Agricultural Development Area (ADA) boundary that exhibit a similar character to the

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I lands currently within the AR district. Specifically, the AR zone is being expanded to the north of Pleasant Run Road and to the east of Hillcrest Road and to the west of Lightfield Road to the Township boundary with Branchburg Township. The AR zone will replace almost all lands currently zoned RR south of Pleasant Run Road. The AR zone will also be expanded west and replace lands zoned RR from Route 523 to Dreahook Road and Mountain Road. North of Route 22, the AR zone will replace all existing areas currently zoned RR with one exception adjacent to the Route 523. Additionally, this zone will replace much of the RO district located east of Route 523 and north of Route 22.

These zoning revisions will establish more land use consistency across the Township. With this expansion, the AR district will now encompass fully 66 of the of the 75 preserved farm parcels in the township (88% of the Township total) containing a total of 4,110 acres of land. It will also contain 16,057 acres of prime soils and soils of statewide importance (72% of the Township total).

The elimination of portions of the RO district will better fit existing conditions as these lots have not been developed in accordance with their nonresidential zoning. The expansion of this residential district is also consistent with the proposed elimination of the eastern portions of the sewer service area in the Township, as single-family homes rely on individual sub-surface septic disposal beds.

The AR district will be replaced by the VR district along Old Highway 28 in the Village of Whitehouse. This zone change is discussed in the VR district section of this document.

The revised AR designation continues to reflect the intent of Readington to base permitted residential density upon the capacity of the land to absorb nitrate contaminants from septic field effluent. This supports the Township goal that the ground water supply is not degraded below the levels contained in the Wastewater Management Plan Rules (N.J.A.C. 7:15 *et seq.*) and New Jersey Groundwater Quality Standards (N.J.A.C. 7:9-1 *et seq.*).

Accordingly, conventional single-family lots will now have a minimum lot size of eight (8) acres. The 8 acre figure is slightly greater than the NJDEP nitrate dilution model recommendation of seven (7) acres (for drought conditions), which represents an average for the entire HUC-11 watershed for undeveloped lands<sup>2</sup>. The Township has

<sup>&</sup>lt;sup>2</sup> A mote detailed discussion of nitrate dilution and the new NJDEP rules is contained at the end of this element and in the Conservation Plan element.



decided to use a larger minimum lot size in the AR district in order to provide an opportunity for more intense development in areas along the Route 22 corridor while still maintaining acceptable average nitrate dilution levels across the watershed as a whole.

The new lot size is also more consistent with the 11.1 acre average lot size for the remaining vacant parcels in the district. The Township should also consider enacting appropriate impervious coverage limits in the AR zone that will help to limit stormwater runoff and aid in the protection of surface water quality. Agricultural cluster development with 1.5 acre lots will continue to be mandatory but the minimum tract size for such clustering is being reduced to 24 acres, which corresponds to a three-lot major subdivision. The open space set-aside will now require that 80% of the tract be devoted to open space or agriculture. On smaller parcels, where cluster development is not as feasible, the minimum lot size of 8 acres will continue to allow for a portion of the lot to be eligible for farmland assessment, while also allowing for a dwelling unit.

The AR district is being removed from portions of the two hamlets - Stanton and Readington - and being replaced with new Hamlet Residential (HR) district. These areas have an established historic development pattern that should be preserved and will be discussed in greater detail under the HR section.

Agricultural commercial villages are being removed as a conditional use. This concept, originally designed to allow for concentrations of services for the agricultural community, has not attracted interest from developers. As discussed in the farmland preservation element of the master plan, local farmers have continued to successfully obtain supplies and materials from nearby locations in Flemington and adjacent areas of Hunterdon County. At present, there is no indication of a need or desire on the part of the local farming community to permit such commercial uses in the AR zone. ECHO housing will continue to be permitted as a conditional use.

Overall, the standards and options within the AR zone are intended to encourage the preservation of the agricultural lands and uses that are an essential component of the rural character of Readington Township while assuring the residents adequate health, safety and general welfare.

#### Rural Residential – RR (I d.u./ 5 acre lot)

The Rural Residential (RR) district is characterized by a mixture of older, small residential subdivisions and unplanned individual lot development. Most properties are

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unsewered and those that are connected have no excess capacity to support new development. The RR district has far fewer agricultural parcels compared to the AR district, and those that are there are generally smaller in size. The RR district, located adjacent to Whitehouse and the Route 22 corridor acts as a transition zone between the more densely developed areas and the rural agricultural environs in the AR district that comprise the bulk of the interior of the Township.

A number of changes are proposed for the Rural Residential district. The district is proposed to be replaced by the AR district in the area north of Route 22 between Route 523 and Tewksbury Township and between Mill and Cedar Roads and Tewksbury Township. The district is proposed to replace the lot in the ROM-2 district with frontage on Coddington Road and the lot in the ROM-2 district with frontage along the eastern side of Ridge Road. Additionally, this district will replace portions of the R-I district which includes larger lots east of Route 523 and north of the railroad.

The maximum permitted density in the RR district is being increased to five (5) acres per dwelling unit to better reflect the nitrate dilution capacity of the land and to allow for closer conformance with the nitrate dilution standards in the NJDEP wastewater management planning (N.J.A.C. 7:15 *et seq.*) and water quality rules (N.J.A.C. 7:9 *et seq.*) for each HUC-11 watershed. Conventional single-family lots will now require five acres of land. As a majority of the RR district land is located within the same HUC-11 watershed as the eastern end of the Route 22 corridor, lowering density here will maintain the opportunity for development along the corridor while meeting the "normal conditions" standard for the nitrates over the watershed as a whole. The Township should also consider enacting appropriate impervious coverage limits in the RR zone that will help to limit stormwater runoff and aid in the protection of surface water quality. Open space cluster developments with 1.5 acre lots will now be mandatory on tracts 20 acres in size and greater. The required open space set aside is being increased to 60% of the tract. Agriculture is being removed as a permitted use in dedicated open space areas. Lastly, the two-acre cluster option is being eliminated.

Agricultural commercial villages are being removed as a conditional use, as active agriculture plays a less prominent role in the proposed RR district. ECHO housing will continue to be permitted as a conditional. Based on the trend in the Township of religious/assembly uses to occupy larger physical spaces, they have become increasingly incompatible with residential districts. These uses are being removed as a permitted conditional use in the RR zone.



These RR district changes will provide for greater land use consistency with the surrounding area. Additionally, the open space set-asides from cluster development will result in better retention and protection of environmentally constrained lands.

#### Hamlet Residential - HR (1 du / 2 acre lot)

This district is being introduced in Stanton and Readington to better reflect existing conditions and preserve the existing character of these rural hamlets. The State Development and Redevelopment Plan describes a hamlet as "a small cluster of homes with a distinct identity in a rural area" and observes that they are typically located at crossroads and have a compact nucleus which permits infill development.

Both of Readington Township's hamlets are worth preserving, so it is intended that any residential development of parcels within the hamlets be sensitive to the historic architecture and scale of the existing homes as well as the development patterns which evolved in these settlements over the years.

Single Family residential uses will permitted on lots of 2 acres. This density reflects a combination of the existing character of these areas and the limitations placed on development as a result of their reliance on septic disposal systems. The development regulations for this district will seek to maintain traditional development patterns and visual character of these places by encouraging, for example, a shallow front setback from the roadway.

ECHO housing will be permitted as a conditional use in the HR zone as will public utilities and cemeteries.

#### Residential - R-1 (40,000 s.f. lot)

The R-I district will be reduced in size. The majority of larger lots between Coddington and Ridge Road, as well as the lots west of Ridge Road, will be rezoned to the RR district. This rezoning to the RR district is more reflective of the undeveloped rural character of these lots and allows the existing RR district to expand north of the railroad. Although unsewered lots in the R-I will continue to utilize RR district standards, this change reflects the fact that many of the lots being rezoned are also are being removed from the sewer service area. Based on the trend in the Township of religious/assembly uses to occupy larger physical spaces, they have become increasingly incompatible with residential districts. These uses are being removed as a conditionally permitted use in the R-I zone.



#### Village Residential – VR (20,000 s.f. lot)

The Village Residential zoning district will continue to provide areas for future development of the existing villages of Three Bridges and Whitehouse Station. The areas within the VR district exhibit traditional development patterns on small lots. Of the lots located in the district, approximately 80%, have lot sizes of less than one acre; additionally, approximately 13% have lots sizes between 1.01 acres and 1.99 acres, and approximately 7.5% of the lots have lot sizes of 2.00 acres or greater. The VR district helps to reinforce the contrast between the centers of Whitehouse, Whitehouse Station, and three Bridges and the surrounding rural environs of the Township.

The VR district will be enlarged to include the majority of the lots in Whitehouse Village, excluding only those that will remain in the B district, and those in the PO and VH districts. This area of expansion was previously located in the AR, B, and RR districts; however, the existing zoning is not reflective of the primarily residential, small lot character of the area. The VR district in the Three Bridges area should be expanded to encompass the Township-owned parcel on Route 202. The existing SC designation on that parcel is no longer feasible due to a lack of sewer capacity to support more intense development.

In addition, the following lots should be rezoned to Village Residential, as they are in proximity to village of Whitehouse Station and abut the Renaissance at Readington (age restricted) development that is currently under construction: The lot currently zoned ROM-I at the end of Mullen Road (former Bramco site), the lot currently zoned R-I at the end of Maple Lane, and the lot currently zoned R-I just north of the railroad tracks with frontage on School Road.

The lot area and, density, and bulk standards for the VR district are being retained. The permitted minimum lot size will remain at 20,000 square feet for tracts with a minimum of 5 acres; otherwise the minimum size for residential lots is one acre.

Townhouses and condominiums will continue to be permitted on tracts 20 acres or greater in size with density calculated at the rate of 20,000 square feet per lot (2 units/acre).

### Clarke Caton Hintz Planned Neighborhood Development – PND, PND-1, PND/SCV

The PND districts have been largely built out over the last twenty-five years and consist of the Hunter's Crossing and Lake Cushetunk Woods developments. A small portion of PND-I along Railroad Avenue that consists of small residential lots should be removed as no further expansion of the Lake Cushetunk development is anticipated. These lots should be rezoned to AR. Elsewhere the PND and PND-I designations should be retained to provide specific zoning regulations to these more densely developed areas of Readington. Based on the trend in the Township of religious/assembly uses to occupy larger physical spaces, they have become increasingly incompatible with residential districts. These uses are being removed as a permitted use in the PND zone.

#### Senior Citizen - SC, SC-2, SC-3, SC-4 overlay

The SC-3 Zone is being removed from the site in Three Bridges along Route 202, given the lack of available sewer infrastructure to support development at higher densities. This area is being replaced by the AR Zone. Similarly, the SC zone is being removed from the Township-owned parcel on Route 202 south of Fox Chase Drive. This parcel is being added to the adjacent VR Zone. The remaining SC-2 zone has a development approval and no changes are recommended. The SC-2 and SC-4 overlay designations have achieved their goal of encouraging this housing type in the Township and should be retained to provide specific zoning regulations to these areas of Readington.

#### Research/office/Manufacturing - ROM-1, ROM-2

The ROM-I and ROM-2 districts broaden the non-residential tax base and provide a resource for local employment. These districts are readily accessible to U.S. Routes 202, 22 and Interstate 78. Much of the property in these districts has direct access on to the highways. Non-residential uses in the ROM-I and ROM-2 zones must be adequately buffered from any adjacent property either zoned or developed for residential use. The width of the buffer and planting requirements should be adjusted according to the relative incompatibility of the adjacent uses and any site specific features which may provide natural buffering.

#### ROM-1

The lands in the ROM-I, will continue to be intended for the research, development and manufacturing of products, delivery of professional services and administration of businesses serving primarily regional and/or national markets.

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One of the three areas in the ROM-I district south of Route 22 will be eliminated. This lot, located east of Route 523, at the end of Mullen Road is the site of a former steelprocessing facility and is not consistent with the character of the surrounding residential neighborhoods. This lot should be rezoned as Village Residential as discussed above. The area of ROM-I at the western end of Route 22 should be reduced to encompass only the land at and surrounding the Salem Industrial Park that is currently developed with non-residential uses. The remaining areas of this district, along Coddington Road and north of Route 22, around the Readington-Lebanon Sewage Authority Plant should be retained in the ROM-I district.

Assembly uses should be added as a conditionally permitted use in the ROM-I zone.

#### ROM-2

This district has been reduced to eliminate those lots along Coddington Road that have not developed in accordance to the ROM-2 district and thus have retained the rural character of much of the surrounding area. The ROM-2 district will continue to be intended to permit the development of small-scale research, office and manufacturing uses on relatively small lots within a corporate/industrial park setting, primarily in the Tannery Road industrial park.

Assembly uses should be added as a conditionally permitted use in the ROM-2 zone.

#### Research Office – RO

The location of the current RO district serves to encourage the expansion of moderate to large scale commercial uses along the eastern portion of the Route 22 corridor, inconsistent with the Township's vision of low intensity commercial uses in this area and the preservation of environmentally sensitive lands. This district will be eliminated from those lands that are north of Route 22 and east of the intersection with Route 523. The RO district will be replaced by the PO district, B district, VH district, AR district and RR district. Readington seeks to strengthen the RO district in the northwestern section of the corridor, occupied primarily by Merck. In this instance, the RO district will replace the isolated area of RR zoning along Halls Mill Road. The replacement of this isolated area with the RO district will create more uniform zoning and will allow for fuller development in accordance with RO district standards, where large corporate uses are well suited. Assembly uses should be added as a conditionally permitted use in the RO zone.



### Clarke Caton Hintz Village Commercial – VC

The Village Commercial District will continue to encourage the retention of existing commercial enterprises and the establishment of additional small-scale retail, service and professional activities in the existing village centers of the Township. While this zone will continue to be predominately mapped in the villages of Whitehouse Station and Three Bridges, it is being expanded to include existing non-residential uses in village of Whitehouse.

Specifically, several lots on the western end of Old Highway 28 in Whitehouse are being rezoned to VC to reflect the existing non-residential uses in contrast to the largely residential character of the remainder of the village.

#### Village Hospitality – VH

A new district, Village Hospitality, is proposed on lands in the sewer service area at the eastern end of the Village of Whitehouse, including the Ryland Inn and the property to the northwest. It replaces the B and RO-I districts. This zone will permit such uses as hotels, bed and breakfast inns, day spas that provide multiple services like fitness, beauty, rejuvenation and relaxation programs, conference centers, and restaurants that are associated with a hotel. The district's intention is to support the existing Ryland Inn as a regional destination and preserve the existing gateway/terminus of Whitehouse village by permitting new uses that will complement a hospitality use. Standards for this district should be developed such that the existing character created by the Ryland Inn, including the historic architecture, scale, and setback, are maintained. The open space along the front of the Ryland Inn should be maintained as a historic component of Whitehouse. The mature trees, historic structures, and proximity to residential areas are integral components of this district and any development should be congruous with the existing character of the area. The minimum lot size for this district should be 10 acres. The FAR should be 0.05, with a bonus to 0.15 available if the Ryland Inn building is reused. The maximum permitted impervious cover should be set at 20% a bonus to 35% available if the Ryland Inn building is reused.. To avoid piecemeal development, applications for development in this zone must be part of a comprehensive plan for both properties.

#### Business District – B

The rural character of Route 22 has eroded over the years with the increase in traffic, development, and related signage. Much of the district outside of the Route 22 and

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Route 523 node consists of small, isolated residential or commercial uses. Accordingly, significant changes are recommended to eliminate the B district along portions of the Route 22 corridor. The goal is to encourage lower-intensity nonresidential uses that will have lower traffic generation and do not require the high visibility signage or building prominence typical of highway retail establishments.

The size of the B district will be reduced along a significant portion of the Route 22 corridor. The VR district, the PO district, the RO district, the RR district, the VH district, and the VR district will replace portions of the B district. The intent of the zone change is to reduce the potential for individual and small-lot retail uses throughout the Route 22 corridor. Rather than having lots along this highway develop independent of each other, the Township desires retail uses to be clustered at the intersection of Route 22 and Route 523 and in the area generally east of the Route 22 intersection with Ridge Road.

The area around the intersection of Ridge Road and Route 22 currently consists of the Wal-Mart store and a small concentration of commercial properties. As this area is smaller in size and contains fewer properties than the main commercial concentration at the intersection of Routes 22 and 523, it is intended to serve a secondary role as a commercial node. In addition, as it is located outside of the sewer service area the properties here have a limited ability to expand.

Accordingly, lands whose B zoning is proposed for elimination will be rezoned to less intense non-residential and residential zoning that more accurately reflects the desired character of the area and the Township's desire for low intensity uses on the periphery of the nonresidential nodes.

The use and bulk standards for the B district should remain the same except that lots without sewer service should have a lower overall intensity. The bulk standards should be revised to allow a maximum FAR of 0.10 and a maximum permitted impervious coverage of 30% for all unsewered parcels, regardless of lot size.

Assembly uses should be added as s conditionally permitted use in the B zone.

#### **Professional Office – PO**

The PO zone is a new district that will permit small office and service uses on small existing lots along the Route 22 corridor. The areas to be designated PO currently consist of a mixture small scale, mostly unsewered non-residential uses; however, several older residential properties are scattered amongst the other uses.



Three nodes of PO district will be located along Route 22, east of its intersection with Route 523. One area is located in the vicinity of Maple Lane and Mullen Road, another is located from just east of Coddington Road to Ridge Road, and the third area will be located on the north side of Route 22 west of County Line Road. Much of these areas are being created from the B district.

The PO zone is intended for low intensity, low traffic-generating uses and therefore will permit office uses but not retail. In general, the district will encourage uses that are not dependent on the provision of sewer. This is consistent with the proposed elimination of the sewer service area east of Coddington Road and the Township's desire for less intense commercial uses along the eastern section of Route 22. The district strives for greater consistency with the existing land uses, which primarily consist of isolated low intensity office and service uses and some residential lots which may be appropriate for residential to office conversions.

Within the PO district, permitted uses will consist of office uses, professional, scientific and technical services, and services to commercial. Mixed use buildings including residential shall be permitted as a conditional use.

The bulk standards for the PO district will, on the whole, reflect the former B district zoning, however they will be adjusted to maintain a lower overall level of development intensity. The minimum lot size for the PO district will be one (I) acre. For lots that have sewer, the maximum permitted floor area ratio, impervious cover and building height should be based on a graduated scale that corresponds to lot size. For unsewered lots the maximum permitted FAR should be 0.10 and the maximum permitted impervious coverage should be 30%, regardless of lot size.

The character of this district is intended to be traditional, reminiscent of the Villages of Whitehouse Station and Whitehouse. To do so, mixed-use buildings and multi-story buildings should be encouraged. The maximum height for lots in the district up to 2.99 acres should be two stories and the maximum height for lots in the district 3.00 acres and greater should be 2 1/2 stories. Assembly uses should be conditionally permitted in the PO zone.

#### Air Safety and Historic Airport District

The Air Safety and Historic Airport Districts should remain in place. These overlay districts provide standards for safety, land use and development controls within and around the existing Solberg-Hunterdon Airport. The purpose of the historic airport



district is to recognize and memorialize the State, national, and international historic significance of Solberg-Hunterdon Airport. The district also recognizes and memorializes that Solberg-Hunterdon Airport is part of the historic and cultural heritage of Readington. The purpose of the Air Safety district is to set minimum standards for the control of obstructions and provide for safe and compatible adjoining land uses. The zoning regulations for these districts should advance these purposes, consistent with regulations for Airport Safety Zones contained in N.J.A.C. 16:62.

### **Buildout Analysis**

A buildout analysis was undertaken to assess the compatibility of Readington's existing and proposed zoning regulations with its current land use goals and objectives. For the residential portion of the model, the analysis examined all of the developable and redevelopable land remaining in the township and predicted the number of new residential units that could, theoretically, be built based on existing and proposed zoning regulations.<sup>3</sup> The non-residential buildout utilized a similar methodology but also took into account the practical limitations on development potential for parcels utilizing individual septic disposal beds. Under the existing zoning scenario, the methodology for both the residential and non-residential buildout first removed from consideration all land subject to regulatory constraints (floodplains, wetlands, and steep slopes greater than 25%,). The existing zoning regulations were then applied to developable land to approximate the number of new residential units and floor area of non-residential development that could be constructed within the Township, both on vacant lots and through the redevelopment on "under-utilized" parcels, or parcels that are developed at less density/intensity than what zoning would allow. The buildout model assumed that no bulk variances would be granted for new residential subdivisions including for lot width and street frontage requirements.

#### Residential

The results of the residential buildout model are presented in the table LU-2 below. The projected residential buildout under existing zoning yielded a total of 1,264 new housing units. Under the proposed zoning scenario, described in detail in this land use plan, the projected number of new housing units under a theoretical full build out was decreased to 772 units. This represents a decrease of 492 housing units or 38.9% from what

<sup>&</sup>lt;sup>3</sup> The model primarily utilized minimum lot area, minimum lot width, and minimum street frontage when assessing the subdivision potential of a parcel of land. It was assumed that no bulk variances would be granted to allow additional units. Vacant lots without street frontage were assumed to be undevelopable.



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would be permitted under existing zoning. The most significant decreases are seen in the AR and RR zoning districts as the minimum lot sizes in those districts are to be increased to 8 acres and 5 acres, respectively. These results indicate that the proposed land use changes will be effective in reducing septic system densities and, therefore, increasing the potential dilution of nitrates entering groundwater in the largely unsewered residential areas of the Township in the AR and RR districts.

	EXISTING ZONING			PROPOSED ZONING		
Zone	PARCELS	ACRES	# of UNITS	PARCELS	ACRES	# of UNITS
SSR	42	619	90	-	-	-
SRR	-	-	-	68	1,220	114
AR	145	3,727	438	246	4,412	455
RR	177	2,345	549	57	723	119
HR	-	-	-	1	6	2
Rı	10	122	34	1	4	3
VR	4	16	9	9	53	79
sc	0	0	0	0	0	0
SC2	0	0	0	0	0	0
SC3	3	32	82	0	0	0
PND	0	0	0	0	0	0
PND1	3	21	62	0	0	0
Totals:	384	6,882	1,264	382	6,418	772

#### Table LU-2 Residential Buildout - Existing versus Proposed Zoning

#### Non-Residential

The non-residential buildout analysis examined all of the developable and re-developable land remaining in the township and predicted the new non-residential floor area that could, theoretically, be built under the existing and proposed zoning schemes. For existing zoning scenarios, the raw numbers were refined by also incorporating the wastewater capacity available on each parcel of land from either the public sanitary sewer system or a private on-site septic disposal bed, depending on the property's current

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wastewater status.<sup>4</sup> As the existing Readington Lebanon Sewerage Authority plant is operating at capacity and no expansions to the plant are anticipated, it was assumed that no new customers would be permitted to come on-line and that existing customers could not expand and produce additional wastewater.<sup>5</sup> Similarly, the Raritan Township MUA has informed the Township that no additional capacity is to be allocated to the Three Bridges area, so the same assumptions were applied to that section of the Township.<sup>6</sup> This sewer based approach to assessing theoretical build out ultimately provided a more accurate prediction of the existing development potential of lands within the Township. The reality is that access to sewer capacity, or the lack thereof, is the most significant determinant of potential growth in the non-residential areas of the Township.

EXISTING ZONING (Gross)			EXISTING ZONING ( with Sewer/Septic Capacity )			
Zone	# of PARCELS	ACRES	Projected Square Feet	# of PARCELS	ACRES	Projected Square Feet
В	95	305.20	1,398,837.33	95	305.20	388,834
RO	50	1,249.88	4,157,749.29	50	1,249.88	1,430,702
ROM1	19	178.47	151,811.54	19	178.47	68,659
ROM <sub>2</sub>	20	233.08	909,186.53	20	233.08	170,481
PO	0	-	-	0	-	-
vc	46	32.22	107,164.14	46	32.22	6,864
νн	0	-	-	0	-	-
Totals:	230	1,998.85	6,724,748.83	230	1,998.85	2,065,540

#### Table LU-3. Non-Residential Buildout - Existing Zoning

<sup>&</sup>lt;sup>4</sup>A property's wastewater status was determined based on Township records of existing sewer customers and unused assigned gallonage for the Readington Lebaon Sewerage Authority or the Raritan Township MUA.

<sup>&</sup>lt;sup>5</sup> The current status of RLSA plant was confirmed by the Township Sewer Advisory Committee.

<sup>&</sup>lt;sup>6</sup> The current status of the Raritan Township plant was confirmed by the Township's wastewater consultants who are currently preparing an updated wastewater management plan for the Township.
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The results of the non-residential buildout (Table LU-3) show that existing zoning, theoretically, permits up to approximately 6,686,327 square feet of new non-residential development. However, these number to do not provide a true picture of the development capacity of the land as they do not take into the account the sewer capacity that is actually available to support new development in the Township or the development capacity of an individual septic system. The Readington-Lebanon Sewerage Authority Plant is currently processing close to Readington's full allocation of 0.96 million gallons per day. The only unallocated gallonage that is remaining has been reserved for emergencies and for projects that propose housing units which meet the Council on Affordable Housing's definition of affordable housing in furtherance of meeting the Township's affordable housing obligation. No further expansions to the plant are currently anticipated. Accordingly, when available sewer capacity and the capacity available from a private septic disposal bed are applied to the existing zoning, the projected buildout falls to 2,065,640 sf. (see the right half of Table LU-3).

The draft revision to the Township's Wastewater Management Plan is recommending, consistent with the new wastewater management plan rules, that the existing Sewer Service Area be reduced to be commensurate with existing and planned capacity. Similarly, the Raritan Township Municipal Utility Authority has indicated that no new capacity will be allocated to service the Three Bridges area of the Township. Thus, estimating potential build out solely on zoning regulations is fallacious. The available sewer capacity along with any the development potential from using septic disposal beds should be considered in order to arrive at a more accurate estimate of potential new development. Further discussion of sewer capacity, septic density, and the new wastewater management rules is provided in the Utility Service Plan element and is fully detailed in the Township's revised Wastewater Management Plan scheduled for adoption in mid 2009.

When sewer capacity and the limitations of a maximum 2,000 gpd septic system are applied, the results of the build out projection paint a different picture. As Tables LU-3 and LU-4 show, under current zoning and with current wastewater capacity, approximately 2,065,540 square feet of new non-residential development could be expected under a full build out scenario. Under the proposed zoning scheme this number decreases only modestly to approximately 1,770,916 square feet. This represents a decrease of about 294,600 square feet or 14.3%. The results of this scenario show that the proposed land use scheme does not remove a significant amount of development potential; rather, it more precisely aligns the zoning regulations with the reality of available wastewater treatment in the Township.

NON-RESIDENTIAL BUILDOUT (PROPOSED ZONING with Sewer/Septic Capacity)					
Zone	# of PARCELS	ACRES	Projected Square Feet		
В	25	55	162,771		
RO	21	570	1,161,791		
ROM1	6	18	45,989		
ROM <sub>2</sub>	9	73	112,457		
PO	25	60	114,448		
VC	6	8	20,964		
νн	2	28	152,495		
Totals:	94	812	1,770,916		

Table LU-4.Proposed Non-Residential Buildout - "Zoning and Sewer Capacity"Composite Scenario

## Nitrate Dilution Analysis by HUC-11 Watershed

In 2008 NJDEP adopted a major revision to the Wastewater Management Plan Rules.<sup>7</sup> The new regulations significantly revise how wastewater planning is to be conducted and emphasize the link to groundwater quality. The regulations further require that a municipality determine the effect on water quality from septic systems by examining the average nitrate dilution levels in the surrounding ground utilizing one of the models specified in the rules.<sup>8</sup> The rules state that for areas with sewage disposal systems discharging 2,000 gallons per day or less to ground water, a municipality must determine the development density that can be accommodated in undeveloped and

<sup>&</sup>lt;sup>7</sup> The new rules were adopted on July 7, 2008.

<sup>&</sup>lt;sup>8</sup> The Township's consultants utilized "A Recharge-Based Nitrate-Dilution Model for New Jersey, MS Excel Workbook, Version 6.0, year 2008 as specified at N.J.A.C. 7:15-5.25(e)1.i(2)

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underdeveloped areas that will result in a concentration of no more than 2.omg/l of nitrate in groundwater on a HUC-II basis (N.J.A.C. 7:I5-5.25(e)I). Accordingly, the results generated from the model provide an estimate of the number of septic systems per acre or minimum lot sizes that can be accommodated in the HUC-II while still meeting the nitrate dilution standard. While the full details of this analysis are presented in the Utility Service Plan element the following discussion summarizes the results.

When the NJDEP nitrate dilution model was applied to developable land in each of the Township's four HUC-II watersheds, the model estimated that septic densities of no more than one unit per 5 acres under normal conditions and 7 acres under drought conditions could be accommodated while still meeting the 2.0 mg/L standard.

Under existing zoning, none of the four watersheds comply with the I unit per 7 acre anti-degradation standard for nitrates.<sup>9</sup> In contrast, under the proposed zoning scenario the septic density across all four HUC-II watersheds was significantly reduced so that three of the four HUC-II watersheds would be in compliance with one unit per seven acres anti-degradation standard and the fourth would at least comply with the one unit per five acre non-drought conditions standard.

Overall, these results show that the proposed land use changes will be effective at improving groundwater quality. They will also allow the Township to meet its goal of bringing its zoning into full compliance with the NJDEP water quality management rules.

<sup>&</sup>lt;sup>9</sup> The Township has chosen utilize the "drought" standard of 1 septic system per 7 acres.





**Clarke Caton Hintz** Architecture Planning Landscape Architecture

Land Use Plan

Readington Township, Hunterdon County, NJ June 2009



# **Conservation and Natural Resources Element**

#### INTRODUCTION

Readington Township is located in northwestern New Jersey, in east-central Hunterdon County. The Township contains 47.85 square miles, making it the largest municipality in Hunterdon County. It measures approximately II miles north to south and 6.5 miles east to west at its widest points. The Township is located on the immediate periphery of the Highlands Water Protection and Planning Region and abuts Highlands municipalities to the west, north, and northeast (Clinton Township, Tewksbury Township, and Bedminster Township, respectively). Although traversed by several major highways including Interstate 78 and Route 22 in the north and Route 202 in the southeast, the majority of the land in Township, especially once away from these highways, maintains a rural character.

The landscape and terrain in Readington varies widely from steep, forested hillsides on the slopes of Cushetunk Mountain and Round Mountain, to gently rolling grasslands and active agricultural areas to narrow stream corridors that wind their way east and south to the north and south branches of the Raritan River. Low density residential areas are distributed throughout the Township with the largest concentrations just to the south of Route 22.

This Plan Element examines the natural features, the natural and man-made systems, and existing and proposed land uses within Readington in order to strike an appropriate balance between future development, the preservation of environmental resources and the capacity of the underlying natural and man-made systems. Critical habitat, topography, geology, soils, steep slopes, flood plains, wetlands, and groundwater quality are considered. State and County policies and goals in support of planning for the protection of these natural resources are also assessed.

In December 2007 The Township adopted a separate Farmland Preservation Plan element. That element replaces the Agriculture section that was formerly contained within the Conservation Element. The Natural Resources Inventory, adopted in 2001, serves as a supplement to this element and contains data and mapping that document the physical character and environmental conditions in the Township.





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Regional Context Readington Township, Hunterdon County, NJ June 2009



# Clarke Caton Hintz WILDLIFE HABITAT

Beginning in 1994, NJDEP initiated a habitat mapping system that categorizes, ranks, and maps wildlife habitat across the State, called the Landscape Project.<sup>1</sup> With the release of Version 2.0 of the Landscape Project in 2001, habitat areas were broken into five types (grassland, forest, forested wetland, emergent wetland, and beach) based on land use/land cover data and then ranked from zero to five according to their significance as habitat for priority, rare, threatened, and endangered species:

- Rank o is assigned to species-specific patches that do not contain any species occurrences and do not meet any habitat-specific suitability requirements.
- Rank I is assigned to species-specific patches that meet habitat-specific suitability requirements such as minimum size criteria for endangered, threatened or priority wildlife species, but that do not intersect with any confirmed occurrences of such species.
- Rank 2 is assigned to species-specific patches containing one or more occurrences of species considered to be species of special concern (this rank represents "rare species" of wildlife as defined in the Highlands Water Protection and Planning Act Rules).
- Rank 3 is assigned to species-specific patches containing one or more occurrences of State threatened species.
- Rank 4 is assigned to species-specific patches with one or more occurrences of State endangered species.
- Rank 5 is assigned to species-specific patches containing one or more occurrences of wildlife listed as endangered and threatened pursuant to the Federal Endangered Species Act of 1973.

<sup>&</sup>lt;sup>1</sup> The Landscape Project was initiated in 1994 by the NJDEP's Division of Fish and Wildlife as part of their Endangered and Nongame Species Program. The goal of the program is to protect the State's biodiversity by maintaining and enhancing imperiled wildlife populations within healthy, functioning ecosystems. The project utilizes geographic information system technology and to map species location and land cover data in order to identify critical wildlife habitat throughout the (New Jersey's Landscape Project Version 2.0, 2001).

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Ranks 3, 4, 5 are considered to be the most critical habitat areas as they contain habitat for threatened and endangered species. The Landscape Project system also specifically identifies wood turtle habitat, bald eagle foraging areas, and peregrine falcon nesting areas as habitat for imperiled species and species of special concern. In 2008, the NJDEP released newly updated versions of this system based on 2002 Land Use/Land Cover (LU/LC) data. Version 3.0 covers the Highlands region and immediately adjacent areas and utilizes a new methodology for delineating habitat that focuses on species suitability rather than on individual land cover types. Referred to as a "species-based patch approach", habitat patches, or areas with suitable land cover for a particular species, are classified based on the occurrence of species present using a similar 0 to 5 ranking criteria as in prior versions.<sup>2</sup> In 2008 the DEP also released Version 2.1 for the remainder of the State, which updated Version 2.0 with 2002 LU/LC data and new species occurrence information.

As Readington Township is immediately adjacent to the Highlands region, it is split by both Version 2.1 and 3.0 of the Landscape Project. Version 3.0 covers those portions of the Township north of Route 22 and West of Route 523, and Version 2.1 covers the remainder of the Township. Accordingly, both sets of data were utilized to assess concentrations of critical habitat. The largest concentrations of critical habitat are found adjacent to Cushetunk Mountain (Round Valley Reservoir), as well as on Round Mountain, and within areas adjacent to stream corridors and within clusters of open meadow and grassland in the southern and northeastern portions of the Township. These features are discussed in greater detail below.

In July 2008 the Landscape Project gained additional relevance within the revised Wastewater Management Plan (WMP) Rules (N.J.A.C. 7:15 et seq.). The WMP rules require that habitat areas be mapped and submitted as part of a wastewater management plan. Landscape Project habitat areas with Ranks 3, 4, or 5 are specifically included in the definition of "environmentally sensitive" areas. The rules state that no amendment to a Water Quality Management Plan (WQMP) will be approved by the DEP if it will cause a negative impact to such an area.<sup>3</sup> Additionally, the rules now prohibit including contiguous critical habitat areas of 25 acres or more within a sewer service area.<sup>4</sup> Cumulatively, these policies represent a marked shift at the State level from presenting the Landscape Project data as advisory information to including it as a critical feature deserving of protection equal to that of wetlands or stream corridors.

<sup>&</sup>lt;sup>2</sup> New Jersey's Landscape Project (Version 3.0 Highlands), p. 15

<sup>&</sup>lt;sup>3</sup> N.J.S.A. 7:15-3.5(b)4

<sup>4</sup> N.J.S.A. 7:15-5.24(b)1

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As part of this Conservation Element habitat data was analyzed alongside other sensitive environmental features (steep slopes, wetlands, flood plains, and stream corridors) and used to develop a composite critical areas layer. This resultant layer identifies land with existing concentrations of environmental resources and critical habitat that should be targeted for protection and preservation.

The following discussion details the locations of critical habitat areas within the Township (also see maps on the following pages):

## Version 3.0 State Threatened Species Occurrence Habitat Patches (Rank 3)

These are areas within the boundary of Version 3.0 that contain patches with one or more occurrence of state threatened species. In Readington, there is a concentration of Rank 3 area to east of Round Mountain and west of Route 523, south of Pleasant Run Road. This area consists primarily of grassland habitat and is currently being used as part of active agricultural operations.

## Version 3.0 State Endangered Species Occurrence Habitat Patches (Rank 4)

These are areas within the boundary of Version 3.0 that contain patches with one or more occurrence of State endangered species. Readington contains three large areas of Rank 4 habitat patches. The largest is associated with the forested land on the slopes of Cushetunk Mountain (Round Valley Reservoir). Another is located in the northwestern portion of the Township on grasslands adjacent to Interstate 78. The third area is associated with woodlands and grasslands in the vicinity of the Lamington River and Rockaway Creek.

## Version 3.0 Federally Listed (Rank 5) Species Occurrence Habitat Patches

These are areas within the boundary of Version 3.0 that contain patches with one or more occurrence of a species that is listed as federally endangered or threatened. The one Rank 5 area in the Township is located just north of Interstate 78 and west of Taylors Mill Road on a parcel owned by Merck and Co. that is currently used, in part, for agricultural purposes. The remainder of this area is wooded.

## Version 2.1 Grassland Habitat (Ranks 3, 4, and 5)

These are areas within the boundary of Version 2.1 that contain critical grassland habitat. Readington has three large concentrations of critical grasslands, mostly associated with agricultural parcels. One area of Rank 4 grasslands is located on and around the lands of Hunterdon-Solberg Airport. Another area of Rank 3 grasslands is located in the center

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of the Township concentrated near Cole Road. The third critical grassland area is located in the southeastern corner of the Township, southeast of Route 202 and is associated with the large agricultural parcels in that area. All of these areas are located within the expanded boundaries of the Agricultural Residential (AR) district.

Version 2.1 Forest Habitat (Ranks 3, 4, and 5)

These are areas within the boundary of Version 2.1 that contains critical forest habitat. The largest concentration of this habitat type is found north of Pulaski Road and east of School Road. This is representative of the fact that there are fewer agricultural parcels in this section of the Township so undeveloped land is typically wooded in character. This area also roughly corresponds to the boundaries of the revised Rural Residential district.

#### Version 2.1 Wood Turtle (Imperiled and Special Concern Species)

Wood Turtles are specifically identified as species of special concern and their habitat is mapped individually as part of the Landscape Project. Rank 3 wood turtle habitat is located in several small pockets in the east central portion of the Township. The two largest areas are located near the intersection of Ridge Road and the railroad right-of-way and around a pond and wetlands south of Chambers Brook Road and North of Edison Road.

The State has given the Landscape Project habitat data an increasingly prominent role in environmental policy. With the adoption of the revised WMP rules, they now have regulatory status for wastewater management planning decisions. Development pressure has led to a fragmentation of habitat, making any contiguous habitat areas that remain even more important for species survival. In addition, these lands often contain or are adjacent to other critical features like wetlands, steep slopes, and stream corridors, adding to their preservation value. Reductions in density and increases in open space set-asides for cluster developments to better preserve remaining critical habitat are warranted.



LANDSCAPE PROJECT VERSION 3.0 Critical Habitat

Readington Township, Hunterdon County, NJ June 2009

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Landscape Project Version 2.1

# **Critical Grassland Habitat**

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# LANDSCAPE PROJECT VERSION 2.1 Critical Forest Habitat

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LANDSCAPE PROJECT VERSION 2.1 Wood Turtle Habitat

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Critical Lands

Readington Township, Hunterdon County, NJ June 2009

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#### Readington Township Conservation and Natural Resources Element June 22, 2009

# Clarke Caton Hintz Preserved Open Space and Critical Habitat Analysis

In conjunction with the buildout model in the Land Use Plan element, an analysis was performed to compare the amount of open space and critical habitat areas that would be anticipated to be preserved under the existing and proposed zoning scenarios. The analysis assumed that for existing zoning all parcels eligible for clustering would take advantage of the clustering provisions. Under the proposed land use plan clustering was assumed to be mandatory in all areas were it was previously voluntary (the SRR and RR districts). A parcel was considered to be eligible for clustering if it met the minimum gross tract size for the particular district and was either vacant, or under-developed, meaning it contained sufficient land area to be subdivided, and was not already preserved as farmland or open space.

Under the existing zoning and clustering regulations, the Township could expect to see approximately an additional 8,027 acres of open space/farmland and 830 acres of critical habitat preserved or set-aside through cluster subdivisions. Under the proposed land use plan these figures would be increased to 9,260 acres of total open space/farmland which includes 1,112 acres of critical habitat area. This represents an increase of 1,223 acres or 15.2% for total preserved land and 282 acres or 34.0% for critical habitat over the existing land use plan. These results support the fact that much of the remaining critical habitat areas in the Township are located on large parcels. By increasing the required open space set asides and requiring that these parcels utilize clustering, it follows logically that the proposed land use plan will be effective in preserving both additional total land and critical habitat. The following chart summarizes the results of this analysis:

Table C-1: Projected Open Space and Habitat Preserved through Clustering					
Zone	Total Open Space Preserved Under Existing Zoning (acres)	Total Open Space Preserved Under Proposed Zoning (acres)	Critical Habitat Preserved Under Existing Zoning (acres)	Critical Habitat Preserved Under Proposed Zoning (acres)	
AR	6,003	7,398	374	613	
RR*	1,445	163	359	63	
SSR/ SRR	579	1,699	100	435	
Total:	8,027	9,260	833	1,112	



\*The amount of land preserved in the RR district decreases under the proposed land use scenario as a result of the overall reduction in size of the district.

## TOPOGRAPHY & SLOPE

Readington Township lies completely within the physiographic province known as the Piedmont. This province has two main elements in Hunterdon County: the Hunterdon Plateau and Raritan Valley Lowland. Only the latter element is evident in Readington. The Lowlands are characterized by low rolling plains which slope gently southeastward from 200-300 feet above sea level in the central section of the county to 150-200 feet near the Hunterdon-Somerset County Boundary. Cushetunk Mountain has two peaks above 700 feet and Round Mountain's peak is over 600 feet above sea level. There are higher elevations in the Cushetunk Mountain area, however, they fall outside of the Township's boundary. With the exception of several other areas in the western section of the Township, the remaining land lies at 300 feet or less above sea level.

The topography of land is important in environmental planning in order to identify critical areas which should remain undeveloped as well as those which are suitable for development. The slopes in Readington Township can be grouped into three categories: o-8 percent, 8-15 percent, and 15 percent and greater. 80% of the Township's land is in the o-8 percent category.

The o-8 percent slope category is found mostly in the eastern and southern portions of the Township. These areas produce the lowest peak rates of water run-off and contain the deepest soil over bedrock. Consequently, these slopes are the least restrictive and are suitable for nearly all agricultural, residential, industrial, commercial and institutional development.

Slopes within the 8-15 percent range are found in approximately 10% of the Township. Generally speaking, areas with slopes of 8-15 percent must be handled sensitively if they are to be developed without producing negative environmental impacts. These slopes must be treated selectively. They can be accommodated within tracts being developed, but it is preferable to avoid re-grading and improvements on the slopes, using them instead as sites for plantings, yard space, and perhaps an occasional, careful siting of a structure. The installation of foundations, basements, walkways, drives and utilities in these areas will prove to be more costly and will require run-off and erosion management techniques. Additionally, a 12 percent slope is considered by the Natural Resources Conservation Service (NRCS) to be the maximum slope suitable for septic tank fields.





# Steep Slopes Readington Township, Hunterdon County, NJ June 2009

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Lands with slopes of more that 15 percent occur in about 10% of the Township. Most of these areas occur around stream corridors and on Cushetunk Mountain. In these areas soils are very often thin and have relatively low natural fertility. It is not uncommon to find that most steep slopes are covered with forest growth. The trees hold the soil in place and provide forest floor mulch which absorbs rain water. The trees also absorb and evaporate large amounts of ground water and therefore make room for additional storage of water. Any disruption of this pattern can have far reaching implications with respect to ground water recharge and erosion.

Development in areas with excessive slope, particularly those above 15 percent should be limited. To the extent possible such land should be left in its natural condition or maintained in grass or tree cover. Disturbing the vegetation on steep slopes can produce severe erosion. Once eroded, it is extremely difficult to reestablish vegetation. Septic tank absorption fields function very poorly on steep slopes with the effluent running through the top layer of soil directly into nearby streams causing pollution of surface water. They also create problems for the construction of driveways and roads as well as being areas of high erosion potential, particularly where existing vegetation is disturbed. The Township has enacted a Steep Slope Ordinance that prohibits development on slopes over 25% and restricts development on slopes from 15% to 25%.

The topography of Readington is a factor contributing to the natural character of the community. Dramatic changes to the existing topography can have a significant negative effect on the visual and spatial character of the Township. The Land Development Ordinance should continue to ensure that topographic changes due to development are minimized. Additional provisions should be considered to prohibit stark changes in topography.

## SOILS & SOIL RELATED DATA

The Soils Map of Readington Township presents the 36 types of soils found in Readington as identified by the Natural Resource Conservation Service. These types are derived largely from the underlying Brunswick Shale. Table C-1, entitled *Soil Limitations for Development* describes the limitations of each of these soil types for various forms of development. The factors which severely limit the use of the land are shallow depth to bedrock, high water table, flooding or stream overflow hazard areas, steep slopes and soil impermeability.

Most of the soils found in Readington have a high water table (less than five feet) and a shallow depth to bedrock. These two factors combine to severely restrict the use of these soils as an assimilator of wastewater. As indicated in the limitations table the bulk of the

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Township consists of soils which are severely limited for on-site septic systems. Soil suitability for septic systems is a function of the relative permeability of the soil, the depth to the seasonal high water table and the depth to bedrock. Where rapidly permeable soils overlay fractured bedrock, such as Brunswick Shale, a septic system will often appear to function efficiently, but groundwater contamination can occur from the movement of improperly filtered septic effluent into the aquifer. If the bedrock is shallow and un-fractured, insufficiently filtered effluent can run along the rock barrier and enter surface waters.

Other implications of bedrock are the increased costs in developing roads, utility lines, and siting buildings. The more bedrock encountered during development, the higher the cost of construction. The most critical function of fractured bedrock is its ability to act as a ground water sponge. In the same manner that untreated effluent can reach ground water supplies, so can rain water be absorbed in large amounts to recharge the ground water supplies. Because of the danger of contamination by surface wastes, it is essential that on-site septic systems not be located over areas with shallow depth to bedrock.

It is important to identify high water tables for similar reasons. In the areas where the water table is less than 5 feet from the surface, there is a higher potential for erosion, wet basements, alteration of plant life and frost action on footings, paving and septic systems.

A notable characteristic of the Township's soil composition is the large areas of agricultural soils, including prime agricultural sols and soils of statewide importance. Prime agricultural soils are defined as those soils that exhibit adequate natural rainfall, temperatures conducive to farming, lack of excessive moisture, proper pH, adequate permeability, soils deep enough to store adequate moisture and aid root growth, and a lack of gravel, cobbles, or stones. Readington contains approximately 12,765 acres (42% of total land area) of prime agricultural soils. Soils of Statewide Importance are those prime agricultural lands suited to the production of regional crops. These soils are characterized by adequate water, temperature, steepness, aspect or other attributes required for regionally significant crops. Readington contains approximately 9,965 acres (33% of total land area) of soils of statewide importance. These agricultural soils are listed in Table C-2 below.

Readington Towns	hip Conservation and N	Natural Resources El	ement
		June 22	, 2009

# Clarke Caton Hintz TABLE C-1: SOIL LIMITATIONS FOR DEVELOPMENT

	USDA	Building Foundations Septic				
Soil Series	Symbol	W/Basement	W/out Basement	Systems	Limitat	ions
Abbottstown	AbA: AdB	С	В		С	I. 2
Alluvial	Ac: Ae	Č	Ē		Č	I, 2
Annandale &	-, -	A	A		В	,
Ednevville	ApB	В	А		В	
Annandale &	ApC	В	В		В	3
Ednevville	I -	В	С		В	3
Athol	AtB; AtC2	А	А		В	)
Athol	AtD2	В	В		С	2, 3
Birdsboro	BdA;BdB;BcC2	А	А		A/B-Bd,C	22
Bowmansville	Bt	С	С		C	I
Bucks	Bub;BuC2	А	А		В	2
Califon	CbB	С	В		С	I
Chalfont	CdB	С	В		С	I, 2
Hazelton	HaC2	А	А		В	2
Klinesville	KIC. KID	С	В		С	I. 2
Lansdowne	LdB	C	В		C	2
Legore	LgC	А	А		В	
Legore	LgD	С	С		С	3
Lehigh	Lhb; LhC2	В	В		С	I, 2
Mt.Lucas	MoB	В	В		С	I, 2
Mt.Lucas-						
Watchung	MwB	С	С		С	Ι
Neshaminy	NeC2	В	А		В	2
Neshaminy	NhC	В	В		С	2
Neshaminy	NhD; NhZ	С	С		С	2
Neshaminy-	NkC	В	В		С	2
Mt.Lucas		С	С		С	2
Norton	NoB	В	А		С	2
Norton	NoC2	В	А		С	2
Norton	NoD2	В	В		С	2, 3
Penn	PeB; PeC2	В	А		С	2
Penn	PeD	В	В		С	2
Penn-	PfB	В	А		С	2
Bucks		А	А		В	2
Penn-	PfC2	В	А		С	2
Bucks		А	А		В	2
Raritan	RbA; RbB	С	В		С	1,2
Readington	ReC2	В	А		В	I, 2
Reaville	ReA;ReB;ReC2	С	В		С	I, 2
Reaville	RfA; RfB	С	С		С	I, 2
Rowland	Ro	С	С		С	I, 2
Rough-	-RIF	С	С		С	
Broken Land						
Turbotville	TuB	С	В		С	I



#### Clarke Caton Hintz Key To Land Use Implications

- A: **SLIGHT** ratings mean little or no limitation or limitations easily corrected by use of normal equipment and design techniques.
- B: **MODERATE** rating means presence of some limitation which normally can be overcome by careful design and management at somewhat greater costs.
- C: **SEVERE** limitations are those which, normally, cannot be overcome without exceptional, complex or costly measure.

#### Key To Limitations

- 1: high water table (0-3 feet)
- 2: shallow depth to bedrock (less than 5 feet)
- 3: strongly sloping (15% or over)

## TABLE C-2 AGRICULTURAL SOILS

#### **Prime Agricultural Soils**

Atb – Athol gravelly loam BdA/B – Bridsboro silt loam BuB – Bucks silt loam MoB – Mount Lucas silt loam NoB – Norton loam PeB – Penn shaly silt loam RbA/B – Raritan silt loam TuB – Turbotville loam

#### Soils of Statewide Importance

AbA/B – Abbotstown silt loam ApC – Annandale and Edneyville gravelly loam AtC2 – Athol gravely loam BuC2 – Bucks silt loam CdA – Chalfont silt loam LpB – Landsdowne silt loam LgC – Legore gravelly loam LhB/C2 – Lehigh silt loam NeC2 – Neshaminy silt loam NoC2 – Norton loam PeC2 – Penn shaly silt loam PfC2 – Penn-Bucks complex ReC2 – Readington silt loam ReA/B/C2 – Reaville silt loam









**Soils** Map 2 of 4 Readington Township, Hunterdon County, NJ June 2009









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# Farmland Soils

Readington Township, Hunterdon County, NJ June 2009

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Several soils occur more frequently in Readington Township than others. Below is a listing of these soils and brief descriptions of their properties:

#### ANNANDALE AND EDNEYVILLE SERIES

Annandale and Edneyville series soils consist of deep gently sloping to strongly sloping, well drained, loamy soils. Permeability is moderate in the surface layer and substratum and moderately slow to slow in the subsoil. The available water capacity is high, and natural fertility is moderate. The gently sloping soils are suited to corn, small grain, soybeans, orchard crops, hay, or pasture. Steeper soils are suited to hay, pasture or trees. Control of erosion is needed in cultivated areas. The agricultural suitability of the soils in this series appears in Class I & Class II.

#### BUCKS SERIES

Buck Series soils consist of deep gently sloping to strongly sloping, well-drained soils that are underlain by Red Shale. These soils are on uplands. Red Shale bedrock is at a depth of about 44 inches. Permeability is moderate to moderately slow to moderately rapid in the underlying material. These soils have a high available water capacity. Natural fertility is moderate. Crops on Bucks soils respond well to lime and fertilizer. Most areas of Bucks soils have been cleared and are farmed. Control of erosion is needed in cultivated areas. The soils are well suited to corn, small grain, soybeans, nursery crops, pasture and hay. The subsoils of this series are in Class II or III.

## KLINESVILLE SERIES

Klinesville series soils consist of shallow, gently sloping to moderately steep, well-drained soils on uplands. Permeability is moderately rapid. Available water capacity and natural fertility are low. The shallow depth of these soils causes low crop production. Many areas of the soils are wooded, especially the steeper slopes. Cleared areas of these soils are used for small grain, hay, and pasture. Areas of sloping to moderately steep soils which have been cleared need careful control of erosion. Many areas are idle or reverting to trees. During periods of prolonged rainfall, the soil becomes saturated and water flows along the surface of the hard bedrock. Water seeps into cellars during these periods. Klinesville soils fall into Class II and III.



## NORTON SERIES

Norton series soils consist of deep, gently sloping to moderately steep soils that formed on rounded slopes and divides in material weathered from old red shale glacial till. Permeability is slow. Available water capacity is high, natural fertility is moderate. Extensive, formerly cleared areas are now idle and reverting to trees. Small areas are used for corn, small grain, hay and pasture. Tillage is delayed in places by excess water above the firm subsoil, but water does not stay in the profile for long periods. Control of erosion is needed. Norton soils are in Classes II and III.

## PENN SERIES

Penn series soils consist of moderately deep, gently sloping to moderately steep, well-drained, loamy soil that formed over red shale or siltstone on uplands. Permeability is moderate to moderately rapid in the surface layer and subsoil. Available water capacity is moderate to high depending on the depth to bedrock and the content of shale. Natural fertility is moderate. Most areas of Penn soils have been cleared for farming. Many areas of the more sloping soils are wooded. Cleared areas require erosion control. In places, late in winter and early in spring, the lowest part of the subsoil is saturated, and water flows laterally over the surface of the bedrock. Water seeps into cellars during these periods. Classes II and III are represented in this series.

The Natural Resource Conservation Service divides the agricultural capabilities of soils into the following classes:

*Class I soils* have few limitations that restrict their use.

*Class II* soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

*Class III* soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

*Class IV* soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

*Class V* soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, woodland, or wildlife habitat.



*Class VI* soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, woodland, or wildlife habitat.

*Class VII* soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture, woodland, or wildlife habitat.

*Class VIII* soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, water supply, or to aesthetic purposes. (No class VIII soils exist in Hunterdon County.)

Only the first four classes are well suited for receiving agricultural crops. All soils series found in Readington have at least one sub-group which can be used for crop production of some type.

#### SEPTIC SUITABILITY OF SOILS

As discussed above, many of the soils in Readington Township have severe limitations on the use septic systems. As depicted on the map below a majority of the Township's soils pose difficulties for the establishment and continued normal functioning of septic systems. A septic system that begins to malfunction can lose its ability to effectively filter nitrate and other hazardous substances from the surrounding groundwater supplies. Although alternate systems exist that can be used in areas with severe limitations, some of these systems, like mounded systems, may have negative visual effects on the surrounding area. The 2007 Hunterdon County Growth Management Plan identified mounded systems and soil replacement techniques as the main alternatives for Readington Township.<sup>5</sup> The extent of these soil conditions throughout the unsewered areas of the Township requires that careful attention be paid to septic density in these locations. Reductions in maximum permitted densities are recommended in these areas to reduce the risk to groundwater supplies from malfunctioning septic systems.

<sup>&</sup>lt;sup>5</sup> 2007 Hunterdon County Growth Management Plan, p. 131



# Septic Suitability of Soils Readington Township, Hunterdon County, NJ June 2009

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## Clarke Caton Hintz Flood Hazard Areas

The flood hazard areas of the Township are defined as the combination of the flood plains and the adjacent flood fringe areas which, during inundation of the normal stream channel, helps to carry the additional water. The Township drains primarily into the South Branch of the Raritan River. The southern two-thirds drain through Pleasant Run and Holland Brook into the South Branch. The northern third uses the North Branch Raritan River as its drainage basin being drained by the North and South Branch of Rockaway Creek, the Lamington River and Chambers Brook. These flood plains occupy approximately 322,094 acres (about 15%) of Township land. Floodplains are most often broken down into two categories – the 100 year floodplain and the 500 year floodplain is defined as the area having a 1% chance of flooding annually and the 500 year floodplain is defined as the area having a 0.05% change of flooding annually.

In the past, all the Township's flood plains have experienced damage due to flooding, particularly those adjacent to the Rockaway Creek and the South Branch of the Raritan River. For this reason it is necessary to place controls on development in these areas. Development should be located on higher ground, well outside of these flood hazard areas to protect future residents from serious loss. Equally important is the preservation of the environmentally sensitive aquatic communities which exist in these stream corridor and flood hazard areas. These communities are often the first link in the food chain of the aquatic as well as other ecosystems. Control of development in these areas is also important in preserving the flood carrying capacity of the stream corridors. Increases in impervious coverage throughout the Township contribute to flooding through increased runoff. Reductions in density/intensity of development should be instituted to help to reduce runoff.

## **Stream Corridors**

Stream corridors include the water course or body, flood plain and flood fringe area, and often include freshwater wetlands and in some cases associated uplands. The NJDEP categorizes streams based on their trout production status ranging from Freshwater Non-Trout (FW-NT) to Freshwater Trout Maintenance (FWT) to Categoy-I (C-I) or exceptional water bodies. State required buffers range from 50' for non-trout waters to 300' for C-I waters. Readington has enacted a stream corridor protection ordinance that requires even greater buffers of 100' for non-trout and 150' for trout maintenance waters, measured form the top of the stream bank. The Township also requires that any application for development containing a stream corridor must dedicate a conservation easement containing the corridor and any adjacent steep slope areas. Protection of



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stream corridors is important because they, like wetlands, serve a vital role in filtering pollutants from rainwater runoff and protecting groundwater. As part of a riparian corridor health assessment study conducted for the Upper Delaware Watershed Management Area, the Rutgers University Center for Remote Sensing and Spatial Analysis (CRSSA) and the North Jersey Resource Conservation and Development Council (North Jersey RC&D) reported phosphorous removal rates by plants in a forested riparian area to be 80%. Similarly, riparian zones on hydric soils were shown to have a ground water nitrate removal rate of more than 80%.

Stream corridor management also has an important role in wildlife management. Stream shading, for example, is important in controlling water temperature and maintaining the fish population. Deer and other fauna use stream corridors as migration routes, as well as water sources. Readington's existing development controls to protect stream corridors should be maintained.

## Wetlands

Readington has significant areas of wetlands with the majority associated with the various stream corridors that traverse the Township. Jurisdiction for the regulation of freshwater wetlands falls under the New Jersey Department of Environmental Protection (NJDEP). NJDEP developed wetlands mapping that identifies wetlands based on three markers. These identifiers include: I) the land at least periodically and predominantly supports hydrophytes (vegetation characteristically found in saturated soils); 2) the soil substrate is primarily un-drained, hydric soil characterized by at least long periods of oxygen starvation; and 3) the substrate is a non-soil and is saturated or covered by shallow water at some time during the growing season.

The New Jersey Department of Environmental Protection continues to use the U.S. Fish and Wildlife's Wetlands classification system. This consists of a hierarchical nomenclature encompassing a wide variety of wetland ecologies. Five systems are defined: Marine, Estuarine, Riverine, Lacustrine, and Palustrine. The Marine system consists of the open ocean and its associated coastline. The Estuarine system includes salt and brackish marshes and the brackish waters of coastal rivers and bays. These two classifications are saltwater wetlands. Freshwater wetlands and deep water habitats (water over 2 meters in depth) are either classified as river or stream based (Riverine); lake, reservoir or large pond wetlands (Lacustrine); or Palustrine encompassing marshes, swamps, bogs, and small ponds. Palustrine wetlands often encompass forested or scrub areas. Nearly all of the freshwater wetlands in Readington are Palustrine, with scattered Riverine types and one Lacustrine wetland at Cushetunk Lake.

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**on Hintz** The delineation of wetlands should not be considered conclusive from the mapping prepared by the NJ Department of Environmental Protection. Individual sites must be surveyed and flagged for wetlands as part of the development review process. Freshwater wetlands are considered environmentally sensitive lands and should not be developed. The Freshwater Wetlands Act (P.L. 1987, c. 156), placed all regulatory control of wetlands with the NJDEP. The Department has produced rules which supersede local control for limited filling on sites with wetlands, upland buffers of up to 150 feet adjacent to wetlands, and procedures for minor encroachments. In development of properties containing critical areas of steep slopes, wetland and flood hazard areas, it is recommended that a minimum standard of non-critical usable lot area be set by the township for each building lot. Development standards should be set to restrict and eliminate disturbance in all delineated critical areas.

Wetlands are one of the most productive ecosystems in the world and host a variety of aquatic and terrestrial species. In fact, approximately two-thirds of New Jersey's threatened and endangered species rely on wetlands<sup>6</sup>.Plant and animal habitat is just one of the functions of this ecosystem, wetlands are also responsible for water storage during periods of flooding since they are able to absorb the water similar to a sponge and then slowly release it. For example, an acre of wetland can store up to I to I.5 million gallons of water<sup>7</sup>. This reduces flood levels, allows for increased groundwater recharge and contributes to the flow of surface water bodies.

Additionally, wetlands serve as water filtration mechanisms. As water is absorbed by the wetland, the suspended sediment settles to the wetland floor and nutrients from sources such as fertilizer application, manure, leaking septic tanks, and municipal sewage are dissolved in the water or are absorbed by plant roots and microorganisms in the soil; other pollutants are also filtered out by sticking to soil particles.

Due to their ability to store flood waters, perform water filtration, provide scenic amenities and provide plant and animal habitat, protection of the wetlands in Readington are critical.

Steep slopes, flood hazard areas, stream corridors, and wetlands are "critical environmental impact areas". It is important to identify and protect these sites, because of the natural protection they offer from soil erosion, excessive flooding, poor air quality and depletion of wildlife habitat. In addition to irreparably damaging these critical

<sup>&</sup>lt;sup>6</sup> http://www.nj.nrcs.usda.gov/programs/wrp/

 <sup>&</sup>lt;sup>7</sup> United State Environmental Protection Agency. <u>Functions and Values of Wetlands</u>.
 September 2001.



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intz environments, developing these areas would be costly. Special and expensive septic systems, foundations and on-site improvements would have to be developed in order to allow building on such land. The Township should decrease the permitted density and increase the open-space set-aside requirement for cluster developments to preserve remaining critical environmental features. To create more opportunities for clustered development, the Township should make cluster subdivisions mandatory in areas where they are now voluntary.



Clarke Caton Hintz Architecture Planning Landscape Architecture

# Floodplains

Readington Township, Hunterdon County, NJ June 2009


Surface Hydrology Readington Township, Hunterdon County, NJ July 2009 Clarke Caton Hintz 
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## **Freshwater Wetlands**

Readington Township, Hunterdon County, NJ June 2009

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## Clarke Caton Hintz GEOLOGY

Four types of underlying geologic formations exist in Readington Township. The predominant formation is the Passaic Formation which forms the topographic low plains of the Township. The higher portions of the Township near Cushetunk and Round Mountains are underlain by the Diabase Formation. Small areas at the southwest and northwest edges of the Township are underlain by the Stockton Formation and the Feltville Formation, respectively

The Passaic formation is comprised mostly of red shale with little primary porosity. However, it is a highly fractured sedimentary rock and ground water runs between the joints and fractures within it. This shale is generally considered to be a good aquifer (source of potable water supply) with an estimated safe water yield of 200,000 to 300,000 gallons of water per square mile per day. The highest yields tend to be in areas near streams or where the shale is overlain by coarse sand and gravel. The general exception to this yield is where the Passaic formation begins to interface with the other geologic formations. In these locations as well as areas of steeper slopes, poorer yields begin to occur. Also on steeper slopes rapid storm water runoff is more prevalent; therefore, there is less opportunity for aquifer recharge.

The remaining formations comprise only small areas of the Township. The diabase formation which underlies Cushetunk and Round Mountains consists of hard volcanic rock. The Stockton formation is comprised primarily of sandstone forms the only other significant aquifer in the Township. It is located near the Stanton Station area in the far southwestern portion of the Township. The Feltville formation consists primarily of siltstone and sandstone and is located in the northwestern corner of the Township. The sandstone rock in this area has been quarried commercially.

## GROUNDWATER

The majority of Readington Township depends on individual wells and ground water resources for most of its water needs. Only certain areas of Whitehouse Station and Three Bridges (specifically the sewer service areas) are serviced by New Jersey American Water Company. Most agricultural irrigation relies on streams and ponds.

The Township's major concern regarding future water supply relates to the quality of ground water resources. This is true for both future uses which continue to rely on individual wells and those for whom New Jersey American Water Company provides services using deep production wells or surface water.



2009 CONSERVATION PLAN ELEMENT Bedrock Geology Readington Township, Hunterdon County, NJ June 2009

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Proper steps must be taken to ensure that residential or commercial development does not jeopardize the aquifer's ability to recharge and supply the Township with the necessary potable water. Groundwater drawn from wells continues to be the primary source of potable water for residents of Readington. The principal threat to Readington's groundwater quality is the contamination that can occur from nitrates contained in effluent from septic disposal fields. High concentration of nitrates may lead to eutrophication of lakes and estuaries. Extremely high concentrations may cause illness, especially in infants. Future development should ensure that groundwater supplies are not subject to degradation by nitrate contamination. Reductions in densities in the unsewered areas of the Township should lower the amount of nitrates from future development entering groundwater.

Protection of the potable water supply is of critical importance in land use planning, particularly in rural areas which rely on groundwater from relatively shallow wells. State and County policies strongly support planning for water quality purposes.

## State of New Jersey Environmental Policies and Action Plan (2007)

The NJDEP has adopted a plan that outlines the policy priorities policies of the Department. This plan includes a set of diverse policy goals along with descriptions of initiatives that are designed to implement them. Protecting ground and surface water is one of the Department's core policies:

Policy: Clean and Plentiful Water

Ensure an adequate supply of clean water to support our state's needs; aggressively minimize the potential for drought in New Jersey by ensuring that water is conserved, reused and managed wisely; and protect and enhance the quality of our rivers, streams, lakes and coastal waters so they are fishable, swimmable, and support healthy ecosystems.

## New Jersey Ground Water Quality Standards NJAC 7:9C-1 et. seq. and Wastewater Management Plan Rules NJAC 7:15 et. seq (revised through July 7, 2008)

The NJDEP has recently revised their groundwater quality standards. The revised rules include an anti-degradation policy for groundwater quality which states "[t]he Department shall protect existing ground water quality that is better than criteria from significant degradation. The Department shall not approve any further degradation of

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ground water quality where background water quality contravenes the criteria."<sup>8</sup> This policy recognizes existing water supplies that have background nitrate levels that are below the state drinking water standard and strives to keep nitrate levels closer to the background level. This policy also builds in a factor of safety to account for anomalies in soils and geology that could result in higher than expected concentrations of nitrates. The anti-degradation policy further specifies "a nitrate concentration of 2 mg/L, which is representative of the average existing ground water quality Statewide, shall be used in determining that existing ground water quality is maintained on a HUC-11 basis".9 This revised standard for Class II groundwater (which underlies most of the State, including Readington) means that the Township must critically examine the effect of septic system density on groundwater quality on a watershed basis in order to comply with the State's anti-degradation policy. These rules provide the Township with a new direction that places preservation of groundwater quality on equal footing with the preservation of open space, critical habitat, and agriculture. This issue and, specifically, the anticipated effect of proposed land use regulations on groundwater quality, are analyzed further in the Utility Service Element of the Master Plan.

The revised NJDEP Wastewater Management Plan Rules which are discussed more fully in the Utility Service Element provide an enhanced focus on the link between wastewater management outside of sewer service areas and groundwater pollution. The WMP rules require municipalities to adjust permitted densities to meet water quality standards. The implication for communities like Readington who have average nitrate levels near or less than 2 mg/l means the effect of density on nitrate levels should be paramount in the minds of policy makers when making land use decisions.

## 2007 Hunterdon County Growth Management Plan

The 2007 Hunterdon County Growth Management Plan contains an analysis of nitrate levels and septic system density and provides specific recommendations for minimum lot sizes in order to preserve existing groundwater quality. The County utilized the New Jersey Geological Survey (NJGS) to conduct a nitrate dilution analysis using the NJGS model for all unsewered areas of Hunterdon County. In one scenario the County utilized a target nitrate level of 1.6 mg/L. According to the County "this represents the existing countywide median nitrate concentration in the groundwater based on a review of 3,155 domestic well samples between 1992 and 2002."<sup>10</sup>. Using this anti-degradation

<sup>&</sup>lt;sup>8</sup> N.J.A.C. 7:9C-1.8(a)

<sup>9</sup> N.J.A.C. 7:9C-1.8(b)3

<sup>&</sup>lt;sup>10</sup> 2007 Hunterdon County Growth Management Plan, p. 24

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target, the NJGS model yielded a recommended lot size of 5.7 acres to 7.5 acres for all of the unsewered areas of Readington Township According to the Plan, the NJGS model was run using average ground water recharge rates.<sup>11</sup> If drought conditions were utilized, lot sizes would need to be increased by 20% to 30%.<sup>12</sup> In addition, the plan explains that a prevalence of older septic systems and/or wetlands in the area could justify further increases in lot sizes as older systems may not be adequately diluting nitrates and wetlands were not included in the model. These results are consistent with a similar analysis on projected nitrate dilution levels for the Township. A discussion of this is provided in the Utility Service Element of the Master Plan

## Natural Resource Conservation Service – 2008 Rockaway Creek Study

The New Jersey Institute of Technology received a grant from the U.S. Environmental Protection Agency STAR (Science to Achieve Results) program to investigate strategies to protect and preserve the long-term sustainability of water resources through community-based land use planning and ordinances in the Rockaway Creek Watershed. The 35 square mile watershed consists of land in Tewksbury Township, Clinton Township, Lebanon Borough and Readington Township. The Rockaway Creek drains to the Lamington River, which is a tributary to the North Branch of the Raritan River.

The study focused on a concept called variable source area (VSA) hydrology or the principle that runoff that carries pollutants and contributes to water quality degradation is primarily generated in relatively small, but predictable, hydrologically sensitive areas. Hydrologically sensitive areas that generate polluted runoff are called *critical source areas*. The study revealed that although some of these critical areas are already protected because they overlap with regulated features like wetlands and stream corridors, large areas are vulnerable to development with impervious cover. There are plans to expand this study to map critical source areas throughout the Township. Once this data is available, the Township should consider protection of these areas by either preserving them formally or regulating permitted density and impervious cover.

## NJ Highlands Water protection and Planning Act

On June 10, 2004, the New Jersey Legislature adopted the "Highlands Water Protection and Planning Act," which is intended to establish a comprehensive, long term approach to the protection and preservation of the drinking water and natural resources of the New Jersey Highlands Region. The Act establishes a Preservation Area comprised of

п *Ibid.* 

<sup>&</sup>lt;sup>12</sup> *Ibid.,* p. 25.

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approximately 395,000 acres within the overall 859,358 acre Highlands region where development would be strictly regulated. The remainder of the Highlands Region is identified as the Planning Area, in which development is monitored but not as strictly controlled. In 2008 the Highlands Council adopted the Highlands Regional Master Plan. Some of the overarching goals of the plan include:

- Protecting the quality and quantity of surface and ground waters
- Preserve farmland and historic sites and other historic resources
- Preserve outdoor recreation opportunities, including hunting and fishing, on publicly owned land
- Promote conservation of water resources
- Promote brownfield remediation and redevelopment

While not formally within the Highlands Region, Readington directly abuts the Highlands to the west, north, and northeast (Clinton Township, Tewksbury Township, and Bedminster Township, respectively) and shares common physical, geological, and hydrological characteristics with this region, particularly in the northern and western areas of the Township.

## STORMWATER MANAGEMENT – IMPERVIOUS COVER

Increased stormwater runoff from impervious surfaces can have many negative consequences. Runoff from driveways and parking lots, as well as from agricultural uses can lead to increased quantities of water-borne pollutants, soil erosion, and stream channel erosion, and increased sediment transport and deposition. Improperly managed and treated runoff also impacts the biota of the Township's aquatic and wetland resources. This includes State listed threatened and endangered species. Regulations governing runoff are found in the Surface Water Quality Standards (*N.J.A.C.* 7:9B-I.I *et seq.*). These regulations establish surface water quality standards and anti-degradation policies applicable to all surface waters of the state

The Township first introduced a stormwater management ordinance in 2002 which was later amended in 2007 to comply with these State rules. This ordinance provides a host of technical requirements applicable to all development in the Township to control and manage runoff as well as requiring each applicant to produce a stormwater management plan. This ordinance did not, however, address the issue of impervious cover requirements which are one of the primary causes of increased runoff.

Owing to the potential of increased runoff to negatively affect groundwater quality and harm habitat for threatened and endangered species, the Township should reduce

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permitted densities and impervious cover and increase open space/farmland set-asides in areas with a concentration of critical habitat areas (Ranks 3, 4, and 5) and critical environmental features. The Township should also consider enacting appropriate impervious coverage limits in residential zones that will help to limit stormwater runoff and aid in the protection of surface water quality.

## TREE PROTECTION

On May 13, 2009 the New Jersey Supreme Court reached a decision in the case of *New Jersey Shore Builders Association v. Township of Jackson* (A-83-2007). The decision validated Jackson Township's tree removal ordinance that required property owners to either replace any tree that is removed or pay into a fund dedicated to planting trees and shrubs on public property. The ruling makes clear that requiring the replacement of trees removed from private property is a valid exercise of municipal police power, including the imposition of a fee where trees cannot be replaced on the same property. This decision also supports the contention that the removal of trees causes detrimental environmental consequences like erosion, dust, and diminution of property value. Readington Township already requires enhanced tree protection in the Steep Slope Residential district. Given this decision from the Court supporting such measures, the Township should consider developing a tree removal and replacement ordinance that could be implemented township-wide.

## **SUMMARY AND RECOMMENDATIONS**

The protection of the natural environment has been a longstanding goal of Readington Township. The Township continues to strive for an appropriate balance between development and preservation. This element has reviewed the current state of the Township's environmental resources with this goal in mind and has focused particularly on the effects of the Township's land use policies on the natural environment. Accordingly, this element offers the following recommendations:

- Reductions in density/intensity of development should be instituted to help to reduce runoff.
- Reductions in density and increases in open space set-asides for cluster developments to better preserve remaining critical habitat and remaining critical environmental features. should be implemented.
- To create more opportunities for clustered development, the Township should make cluster subdivisions mandatory in areas where they are now voluntary.



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- Readington's existing development controls to protect stream corridors should be maintained.
- The Land Development Ordinance should continue to ensure that topographic changes due to development are minimized. Additional provisions should be considered to prohibit stark changes in topography.
- Readington should ensure that its policies and ordinances are generally consistent with the broad goals of the Highlands, especially as they pertain to the protection of groundwater quality.
- The Township should reduce permitted densities in all unsewered areas to attain or exceed minimum standards for compliance with water quality and wastewater management planning regulations.
- Scenic resources, or viewsheds, with the Township should be identified and the Land Development Ordinance should be updated to ensure their preservation.
- Owing to the potential of increased runoff to negatively affect groundwater quality and harm habitat for threatened and endangered species, the Township should reduce permitted densities and permitted impervious cover in areas with a concentration of critical habitat areas or critical environmental features.
- The Township should consider developing a tree removal and replacement ordinance that could be implemented township-wide.
- The Township should pursue strategies to enhance the protection of critical; habitat areas and threatened and endangered flora throughout the Township.



## Clarke Caton Hintz

## **Utility Service Element**

This element details the existing state of sewer and water service within the Township and discusses recommended changes to the sewer service areas (SSA) that are being prepared concurrently as part of the Township's revised Wastewater Management Plan.

Readington Township contains two primary utility service areas. The main service area is located along the Route 22 Corridor, centered around the villages of Whitehouse and Whitehouse Station. The other is in the village of Three Bridges in the southeastern corner of the Township. In addition, the Hedgerow Estates subdivision on Route 523 near Darts Mill, also receives sewer service. The existing sewer service areas are shown on the map on page 88.

Within the Township, there are also several smaller, private treatment facilities that serve one site or a small contained area:

- Stanton Ridge Golf Course Community: This facility currently serves 157 homes (approximately 471 people) and the golf course clubhouse.
- Whitehouse Plaza site (Wal-Mart): This is the former site of the Laneco Discount Store. Wal-Mart took over the site in 2003 and renewed the NJDPES permit for subsurface sewage disposal.
- Deer Path YMCA: This facility is located at the southern end of Township off West Woodschurch Road. This facility has a NJPDES permit for up to 9,000 gpd of subsurface disposal.
- Fiddler's Elbow Golf Course: This facility, in the extreme northeastern corner of town, serves the golf course and associated residences in Bedminster Township, Somerset County; however, the treatment plant and discharge point are located in Readington.

There are also 2 industrial wastewater treatment facilities, Readington Farms on Mill Road and Vianini Pipe on County Line road. Readington Farms discharges to the Readington-Lebanon Sewerage Authority for secondary treatment and Vianini Pipe has on-site pretreatment prior to groundwater discharge. The remaining areas of the Township utilize individual subsurface septic disposal systems (septic) systems.

# Clarke Caton Hintz Readington-Lebanon Sewerage Authority/New Jersey American Water Company

The Whitehouse and Whitehouse Station area has been on line with the Readington Lebanon Sewer Authority (RLSA) since 1981 and New Jersey American Water (formerly Elizabethtown Water Company) since 1985. Today, the RLSA serves approximately 1,420 customers in Readington Township. The largest single customer in the SSA is the Merck headquarters near Interstate 78.

The Readington Lebanon Sewer Authority plant is located off Old Route 28. Sewage pumped through this station receives secondary treatment and is then discharged into Rockaway Creek. At inception in 1987 the RLSA came on line a total plant capacity of 800,000 gallons per day (gpd). The plant was expanded after 2000 to 1,200,000 gpd.

The total sewer allocation for the Township from the RLSA has not changed since its inception and remains at approximately 80% of plant capacity or 960,000 gallons per day (gpd). As of 2008 the annual average daily flow was 0.695 MGD.<sup>1</sup> Of this flow approximately 72% was estimated to come from residential uses, 13% from commercial, 8% from industrial, and 7% from inflow and infiltration into the system.<sup>2</sup> In September 2008 an amendment to the wastewater management plan (WMP) was approved to abandon the Board of Education's on-site disposal system at Holland Brook School and Readington Middle School and to incorporate these parcels within the Readington-Whitehouse Sewer Service Area.

The majority of the remaining sewer capacity has been allocated to approved development that has yet to be constructed. All other units of capacity are either being reserved for emergencies (allocation to properties with failing septic systems within the SSA) or have been set-aside specifically to be used for affordable housing units that satisfy the Township's COAH obligation.<sup>3</sup> There are no plans to increase the capacity of the RLSA plant in the near future.

The present sewer service area boundary contains numerous properties that are not existing customers, particularly along the eastern section of Route 22, but also to the

<sup>&</sup>lt;sup>1</sup> 2009 Hunterdon County Wastewater Management Plan – Readington Township Chapter,

p. 3.3

<sup>&</sup>lt;sup>2</sup> Ibid

<sup>&</sup>lt;sup>3</sup> Township Ordinance #4-2003, adopted on April 21, 2003 specifically reserved wastewater capacity for development containing affordable housing that contributes to satisfying the Township's affordable housing obligation.

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west near the Clinton Township border. Based on the capacity constraints, it is unlikely that these properties will be connected to the system. The results of the buildout analysis discussed in the land use plan element show that the projected wastewater flow from these properties would far exceed the 0.96 MGD Township allocation. The revised wastewater management plan rules (NJAC 7:15) adopted on July 7, 2008 require that the projected flows within an SSA be consistent with the available or planned treatment capacity. Since no new capacity is anticipated, changes to the SSA boundary are warranted.

Given that no excess capacity exists to extend service to currently unsewered properties in the SSA and that the Township wishes to concentrate development strategically to discourage sprawl along the Route 22 corridor, it is recommended, consistent with NJDEP rules, that the Wastewater Management Plan be amended to revise the Sewer Service Area boundary to generally remove properties that are not existing customers.

The Readington-Whitehouse Sewer Service area boundary should be revised to eliminate those areas generally east of Coddington Road and generally west of Van Horne Drive (see the existing and proposed SSA map on the following pages for a complete description). The areas proposed for elimination consist of low intensity uses. The revised sewer service area is intended to provide service to only those areas where sewer infrastructure currently exists and growth is encouraged. The sewer service area amendments are complemented by the revisions to the land use plan contained in the Land Use Plan element.

In addition, consistent with the revised WMP rules, it is recommended that the Waste Water Management Plan eliminate the 20,000 gallons per day discharge to groundwater designation located off of County Line Road. The revised WMP rules no longer permit these areas. As such, the WMP should reassign these properties to the septic system areas with a maximum discharge of 2,000 gpd.

## Three Bridges-Raritan Township MUA/NJ American Water

The Three Bridges area of Readington has been serviced by the Raritan Township Municipal Utilities Authority (RTMUA) since 1983. NJ American Water also supplies water for this area. Their first sewer connection in this portion of the Township was in 1985 for the Hunter's Crossing Townhomes. Including the Hedgerow Estates subdivision, which is also served by the RTMUA, there are currently 696 customers.



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**Hintz** The Raritan Township Municipal Utilities Authority plant is adjacent to Three Bridges across the South Branch of the Raritan River. The wastewater from this plant receives secondary treatment before it is pumped into the South Branch of the Raritan River.



# **Existing Sewer Service Areas**

Readington Township, Hunterdon County, NJ June 2009

Architecture Planning Landscape Architecture



## **Proposed Sewer Service Areas**

Readington Township, Hunterdon County, NJ June 2009

Architecture Planning Landscape Architecture





Water Franchise Areas Readington Township, Hunterdon County, NJ June 2009

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The Three Bridges area is allocated 125,000 gpd of wastewater capacity by the Raritan Township Municipal Utilities Authority. As of 2008 over 111,000 gpd, on average, are being used.<sup>4</sup> Of this flow approximately 90% was estimated to come from residential uses, 8% from commercial, and 2% from inflow and infiltration into the system.<sup>5</sup> As of 2008 the plant's overall capacity was 3.8 MGD. Although the plant has been expanded over the years, no additional capacity has been or is planned to be allocated to Readington Township by the RTMUA.

As no additional capacity is planned for the Three Bridges Area, it is recommended, consistent with the WMP rules in N.J.A.C. 7:15, that that lots on the fringes of the existing SSA that are not existing customers be removed from the sewer service area (see the existing and proposed SSA map on the following pages for a complete description).

## Revised Wastewater Management Plan Rules and Septic System Density

Those areas outside of the Sewer Service Area, as well those within who do not have a sewer allocation, are relegated to the use of on-site septic disposal systems and are also subject to the recently revised wastewater management plan rules (N.J.A.C 7:15). These regulations specify maximum average nitrate dilution standards for new development measured on a watershed (HUC-11) basis and place a new 2.omg/l limit for nitrate levels in groundwater. The net effect of these rules is to establish a limit on the capacity of land in each HUC-11 watershed to accommodate new septic systems while still maintaining groundwater quality.

In order to comply with the revised rules the Township must first determine the maximum septic density for each watershed. This requires that nitrate levels be modeled based on projected development for each HUC-II in the municipality. In conjunction with the buildout projections undertaken for the land use plan element, an analysis of projected nitrate levels in groundwater and estimated maximum septic density was performed for each HUC-II watershed. A summary of this analysis is presented below.

## Hydrologic Unit Code-11 (HUC-11) Watershed Nitrate Dilution Analysis

Residential lot size or density has a direct relationship to the concentration of nitrates in ground water supplies. Mathematical models may be employed to determine

<sup>4 2009</sup> Hunterdon County Wastewater Management Plan – Readington Township Chapter, p. 3.3

<sup>5</sup> Ibid



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<sup>tz</sup> appropriate lot sizes and density in order to attain a target level of nitrates in groundwater. Known as nitrate dilution models, these calculations consider aquifer recharge rates, natural de-nitrification rates, persons per family, wastewater generation per person, and initial nitrate concentration in the estimation of a final nitrate concentration.

As discussed above, in July 2008 NJDEP adopted a major revision to the Wastewater Management Plan Rules.<sup>6</sup> The new regulations significantly revise how wastewater planning is to be conducted and emphasize the link to groundwater quality. The regulations further require that a municipality determine the effect on water quality from septic systems by examining the average nitrate dilution levels in groundwater utilizing one of the models specified in the rules.<sup>7</sup> The rules state that for areas with sewage disposal systems discharging 2,000 gallons per day or less to ground water, a municipality must determine the development density that can be accommodated in undeveloped and underdeveloped areas that will result in a concentration of no more than 2.0mg/l of nitrate in groundwater on a HUC-II basis (N.J.A.C. 7:I5-5.25(e)I). Accordingly, the results generated from the model provide an estimate of the number of septic systems per acre or minimum lot sizes that can be accommodated in the HUC-II while still meeting the nitrate dilution standard.

The Township falls within portions of four HUC-11 watersheds and, therefore, must analyze the nitrate concentration in each area to determine compliance. The four watersheds are:

- I. Raritan River South Branch (From Three Bridges to Spruce Run)
- 2. Raritan River South Branch (From the North Branch to Three Bridges)
- 3. Raritan River North Branch (From the South Branch to the Lamington)
- 4. Lamington River

The results from the DEP nitrate dilution model indicated that, based on soil conditions, all four HUC-II watersheds could accommodate a maximum of one unit per five acres under standard conditions and a maximum of one unit per seven acres under drought

<sup>&</sup>lt;sup>6</sup> The new rules were adopted on July 7, 2008.

<sup>&</sup>lt;sup>7</sup> The Township's consultants utilized "A Recharge-Based Nitrate-Dilution Model for New Jersey, MS Excel Workbook, Version 6.0, year 2008 as specified at N.J.A.C. 7:15-5.25(e)1.i(2)

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(anti-degradation) conditions<sup>8</sup>. The Township has determined that conforming to the drought condition standard is preferable as it provides a greater likelihood that water quality standards will be met under a range of climate and soil conditions.

Accordingly, a buildout analysis was conducted for each HUC-II watershed under the existing and proposed zoning schemes in order to compare compliance with the 2.0 mg/l standard. Residential growth was analyzed by comparing the available developable acreage outside of the sewer service areas with the projected number of new units. Nonresidential growth was reviewed by converting the projected square feet of development into equivalent dwelling units (EDUs). This was done by multiplying the projected square feet of new development outside of sewer service areas in each HUC-II by the NJDEP wastewater standard for retail and commercial buildings on septic systems (0.125 gallons per day). That figure was then divided by the revised NJDEP equivalent dwelling unit (EDU) standard of 500 gallons per day. The resultant equivalent dwelling unit figure is combined with the residential projections and divided into the developable acreage to obtain a projected density.

The following charts show the predicted septic density for areas outside of a Sewer Service Area (SSA) in each HUC-11 watershed under existing and proposed zoning schemes:

<sup>&</sup>lt;sup>8</sup> 2009 Hunterdon County Wastewater Management Plan – Readington Township Chapter, p. 5.3-5.5

## **Clarke Caton Hintz**

Table US-1 - HUC-11 Analysis - Existing Zoning										
HUC-11	Total Acres	Total # of Parcels	Developable Acres outside of SSA	# of Developable Parcels Outside of SSA	Projected Units and Equivalent Dwelling Units	Projected Acres per Unit				
Raritan River										
South Branch										
(Three Bridges										
to Spruce Run)	5,020	733	857	55	130	6.59				
Raritan River										
South Branch										
(North Branch										
to Three										
Bridges)	13,412	3,070	2,749	I73	481	5.72				
Lamington										
River	7,242	1,991	1,626	69	236	6.89				
Raritan River										
North Branch										
(South Branch										
to Lamington)	3,939	1,005	883	65	396	2.23				
Totals:	29,613	6,799	6,115	362	I,243	-				

The results show that at full buildout under existing zoning (Table US-I), no watersheds meet the I unit per 7 acre standard for nitrates (all are under 7). In addition, the Raritan River North Branch watershed fails to meet even the I unit per 5 acre standard for non-drought conditions.

Under the proposed zoning scenario (Table US-2), the septic density across all four HUC-II watersheds has been reduced. Three of the four HUC-II watersheds are now in compliance with I unit per 7 acres standard. Although projected septic density in the fourth HUC-II watershed (Raritan River North Branch) is below the drought standard, the density has been effectively reduced so that this watershed now complies with the I unit per 5 acre non-drought conditions standard. This is acceptable given the smaller lot sizes and more developed conditions already present in this watershed.



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Overall, these results show that the proposed land use changes described in the land use plan element will be effective at improving groundwater quality. They will also allow the Township to meet its goal of complying with the NJDEP water quality management rules.

Table US-2: HUC-11 Analysis - Proposed Zoning									
HUC-11	Total Acres	Total # of Parcels	Developable Acres outside of SSA	# of Developable Parcels Outside of SSA	Projected Units and Equivalent Dwelling Units	Projected Acres per Unit			
Raritan River									
South Branch									
(Three									
Bridges to									
Spruce Run)	5,020	733	944	59	102	9.25			
Raritan River									
South Branch									
(North Branch									
to Three									
Bridges)	13,412	3,070	2,718	168	307	8.85			
Lamington									
River	7,242	1,991	1,860	104	178	10.45			
Raritan River					·				
North Branch									
(South Branch									
to Lamington)	3,939	1,005	913	74	169	5.40			
Totals:	29,613	6,799	6,457	413	765	-			



# Watershed Boundaries

Readington Township, Hunterdon County, NJ June 2009

Clarke Caton Hintz 
Architecture
Planning
Landscape Architecture



## Clarke Caton Hintz Summary and Recommendations

The foregoing analyses have examined the existing state of utility service in the Township. Currently, a disparity exists between the amount of available wastewater capacity and the development potential within the Sewer Service Areas. In addition projected densities in septic areas exceed DEP standards for nitrate dilution. Therefore, this element offers the following recommendations:

- In conformance with DEP rules, revise the Readington-Whitehouse Sewer Service area boundary to remove parcels generally east of Coddington Road and west of Van Horne Drive that are not existing customers.
- Eliminate the 20,000 gallons per day discharge to groundwater designation located off of County Line Road.
- Eliminate the 20,000 gallons per day discharge to groundwater designation area on Route 202.
- Remove parcels at the edge the Three Bridges Sewer Service Area that are not existing customers.
- Implement the zoning changes recommended in the Land Use Plan in order to reduce permitted densities in septic areas and comply with DEP nitrate dilution standards.