Environmental Features

SECTION 4 – ENVIRONMENTAL FEATURES

The protection of natural resources requires more than just regulatory controls. It is necessary to establish proactive planning techniques to be implemented at all levels of government not only to address existing harmful threats but also to guide future development activities to be compatible with the protection of these resources.

Wetland Areas

Wetlands, until recently, were considered wastelands suitable primarily for drainage, fill and subsequent development. The significance of freshwater wetlands in the maintenance of environmental quality through flood control, groundwater protection, pollution filtration and ecological productivity has been recognized by both the Federal and State governments.

Several years ago, the Federal government undertook a nationwide survey of wetlands. The National Wetlands Inventory, prepared by the United States Department of the Interior, Fish and Wildlife Service, provided a comprehensive inventory of wetland areas for all municipalities in the State of New Jersey as well as the Country. The Wetlands Inventory noted that the data was prepared

> ...primarily by stereoscopic analysis of high altitude aerial photographs... and were identified on the photographs based upon vegetation, visible hydrology and geography in accordance with classification of wetlands and Deep-Water Habitats of the United States...

The U.S. Department of the Interior, Fish and Wildlife Service, has defined wetlands as follows:

> In general terms, wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. The single feature that most wetlands share is soil or substrate that is at least periodically saturated with or covered by water. The water creates severe physiological problems for all plants and animals except those that are adapted for life in water or in saturated soils.
>
> WETLANDS are lands transitional between terrestrial and aquatic systems where the table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophites; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water at some time during the growing season of each year.

There are approximately 47.45 acres of wetlands within the municipality. These wetlands are subdivided into two wetland classifications: Deciduous Wooded Wetlands and Managed Wetlands in a Recreational Area.

Table 4 – 1 :
Wetland Classification, Location, Area
Township of Cedar Grove

Wetland Classification	Number of Sites	Acreage
Deciduous Wooded Wetlands	16	46.22
Managed Wetland in built up maintained Rec Area	2	1.23
Total		**47.45**

Source: New Jersey Department of Environmental Protection

Deciduous Wooded Wetlands

These wetlands are closed canopy swamps dominated by deciduous trees normally associated with watercourses, edges of marshes, and isolated wetlands. The important canopy species includes Acer rubrum, Nyssa sylvatica, Fraxinus pennsylvanica, Salix nigra, Quercus bicolor, Q. phellos, Q. falcata, Liquidambar styraciflua, and Platanus occidentalis. These species combine to form a series of mixed hardwood lowland habitats throughout the entire state.

Managed Wetland in built up maintained Rec Area

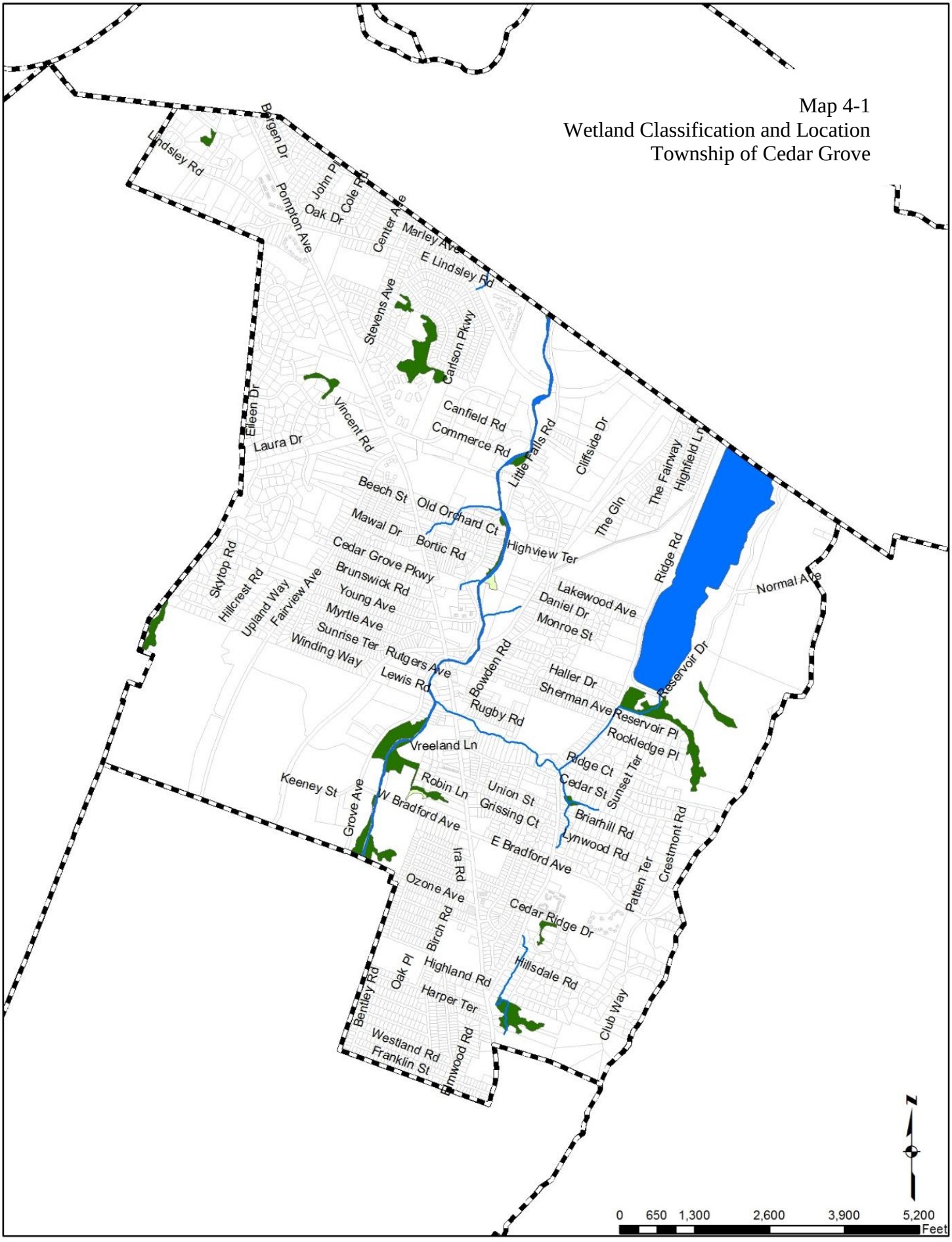
Included in this category are former natural wetland areas that now are part of an altered managed recreational area, but which still exhibit signs of soil saturation on the imagery. These areas do not support typical wetland vegetation, but are vegetated primarily by grasses and other planted vegetation that may be routinely mowed. Examples of this category would be saturated portions of golf courses, and fields used for baseball and other sports in designated recreation areas. None of the wetlands included in this category are routinely inundated, although portions may be on occasion. These altered wetlands exist on areas shown on the US Soil Conservation Service soil surveys to have hydric soils.

N.J.A.C. 7:7A-6.1(a) 1 and 2 describes freshwater wetland transition areas as follows:

> 1. An ecological transition zone from uplands to freshwater wetlands which is an integral portion of the freshwater wetlands ecosystem, providing temporary refuge for freshwater wetlands fauna during high water episodes, critical habitat for animals dependent upon but not resident in freshwater wetlands, and slight variations of freshwater wetland boundaries over time due to hydrologic or climatologic effects; and
>
> 2. A sediment and storm water control zone to reduce the impacts of development upon freshwater wetlands and freshwater wetlands species.

In the event that the characteristics and limits of a wetlands area are known, it is necessary to ensure that transition areas are provided pursuant to the requirements of the *Freshwater Wetlands Protection Act*.

Map 4-1
Wetland Classification and Location
Township of Cedar Grove



Flood-prone Areas

Floods pose serious threats to life and property affecting not only abutting property owners, but down-stream neighbors as well. As development occurs in up-stream areas, lands in flood plains may be filled, thereby diminishing the capacity to store floodwaters. This diminished capacity means that downstream areas may be subject to increased volumes of water causing additional flooding. It is for this reason that flood-prone areas are included as part of this report. The flood-prone areas were ascertained from the Federal Emergency Management Agencies FIRM Maps.

The flood-prone areas have been delineated through the use of readily available information based on past floods rather than from detailed surveys and inspection. In general, the delineated areas are for natural conditions and do not take into account the possible effects of existing or proposed flood control structures except where those effects could be evaluated.

This data is also pertinent for planning purposes since it signals areas where development may be restricted because of direct threats to property and life, and because of potential degradation of the abutting water courses by the introduction of pollutants.

There are approximately 36.96 acres of lands that are classified as flood prone areas. These flood prone areas are separated into two (2) categories as follows:

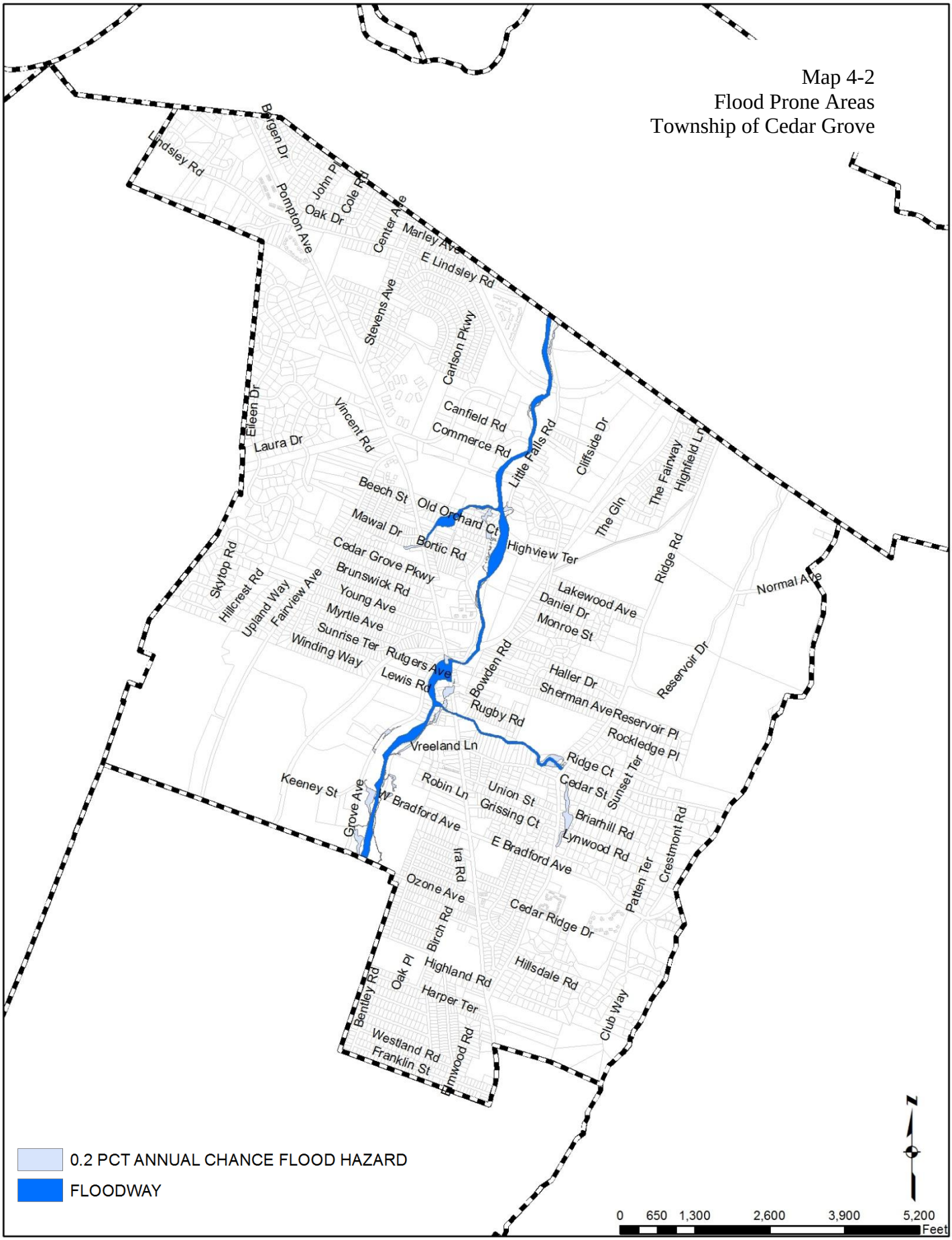
Zone "X"
Areas determined to be outside 500-year floodplain determined to be outside the 1% and 0.2% annual chance floodplains.

Zone "AE"
Areas subject to inundation by the 1 percent annual chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply

Table 4 – 2 :
Flood Prone Lands, Location, Area
Township of Cedar Grove

Flood Prone Zones	Locations	Acreage
0.2 PCT Annual Chance Flood Hazard (500 Year Storm)	26	9.25
Floodway	2	27.70
Total Flood Prone		**36.95**

Source: FEMA DFIRM 2020


Map 4-2
Flood Prone Areas
Township of Cedar Grove
Lindsley Rd
Bergen Dr
John Pl
Cole Rd
Oak Dr
Pompton Ave
Center Ave
Marley Ave
E Lindsley Rd
Stevens Ave
Carlson Pkwy
Eileen Dr
Laura Dr
Vincent Rd
Canfield Rd
Commerce Rd
Little Falls Rd
Cliffside Dr
The Fairway
Highfield Ln
The Gln
Beech St
Old Orchard Ct
Mawal Dr
Bortic Rd
Highview Ter
Ridge Rd
Normal Ave
Skytop Rd
Hillcrest Rd
Upland Way
Fairview Ave
Cedar Grove Pkwy
Brunswick Rd
Young Ave
Myrtle Ave
Sunrise Ter
Winding Way
Rutgers Ave
Lewis Rd
Lakewood Ave
Daniel Dr
Monroe St
Bowden Rd
Haller Dr
Sherman Ave
Reservoir Dr
Reservoir Pl
Rockledge Pl
Rugby Rd
Vreeland Ln
Ridge Ct
Cedar St
Sunset Ter
Keeney St
Grove Ave
W Bradford Ave
Robin Ln
Union St
Grissing Ct
Briarhill Rd
Lynwood Rd
E Bradford Ave
Crestmont Rd
Patten Ter
Ira Rd
Ozone Ave
Birch Rd
Cedar Ridge Dr
Oak Pl
Highland Rd
Hillsdale Rd
Bentley Rd
Harper Ter
Club Way
Westland Rd
Franklin St
Lynwood Rd
0.2 PCT ANNUAL CHANCE FLOOD HAZARD
FLOODWAY
N
0 650 1,300 2,600 3,900 5,200
Feet

Soil Conditions

Soils play a critical role in the environment. They support an area's vegetation, absorb rainwater, and provide habitat. The physical and chemical properties of soils reflect a large number of variables, including the parent material (bedrock), climate, vegetative cover, animal activities, slopes and drainage patterns, and time. New Jersey's fairly complex bedrock geology, history of glaciations, abundant precipitation, and patterns of human use has led to complex patterns of soil distribution. (*NJGS Information Circular, Geologic Mapping in New Jersey*)

Soil Classifications

The official Soil Survey for Essex County was updated in 2008 by the National Resources Conservation Service (NRCS), an agency of the United States Department of Agriculture (USDA). The forward to the report states the following:

> This soil survey contains information that can be used in land-planning programs in Essex County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of the selected land uses on the environment.
>
> This soil survey is designed for many different users. Farmers, foresters and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect and enhance the environment.
>
> Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited for basements or underground installations.
>
> These and many other soil properties that affect land use are described in this soil survey. Broad areas are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

The soils maps and tables in this and master plan are based on the data from that official survey. The NRCS Soil Survey plots soils by map units. The Soil Survey names each map unit based on the characteristics of the dominant soils within that unit. These map unit names identify the soils by both their soil series classification(s), such as Rockaway, and by characteristics that range from gravelly sandy loam with slopes of 3 to 8 percent to rock outcrop with slopes of 25 to 45 percent.

Each map unit name has an associated abbreviation that offers a shorthand version of this classification system. The abbreviation system identifies the soil types by steepness, stoniness and frequency of flooding as follows:

- Capital letters at the end of the abbreviation indicate the slope phase, with "A" being less steep and "E" being steeper. An example is the Rockaway-Rock outcrop complex, which includes RomC, RomD and RomE.

- The lowercase letters "a", "b" or "c" following these capital letters indicate the degree of stoniness: stony, very stony, and extremely stony, respectively. An example is the Rockaway series RobCb and RobDc.

- The lowercase letter "t" at the end of the abbreviation indicates "frequently flooded." An example is the Adrian series; AdrAt.

The soil conservation report identifies 42 different soil types in the Township of Cedar Grove. These soils can be classified into sixteen soils series. Table 4 – 3 (located on page 4-14) indicates the respective areas of various soil types in acres.

Map 4-3
Soils Classification
Township of Cedar Grove

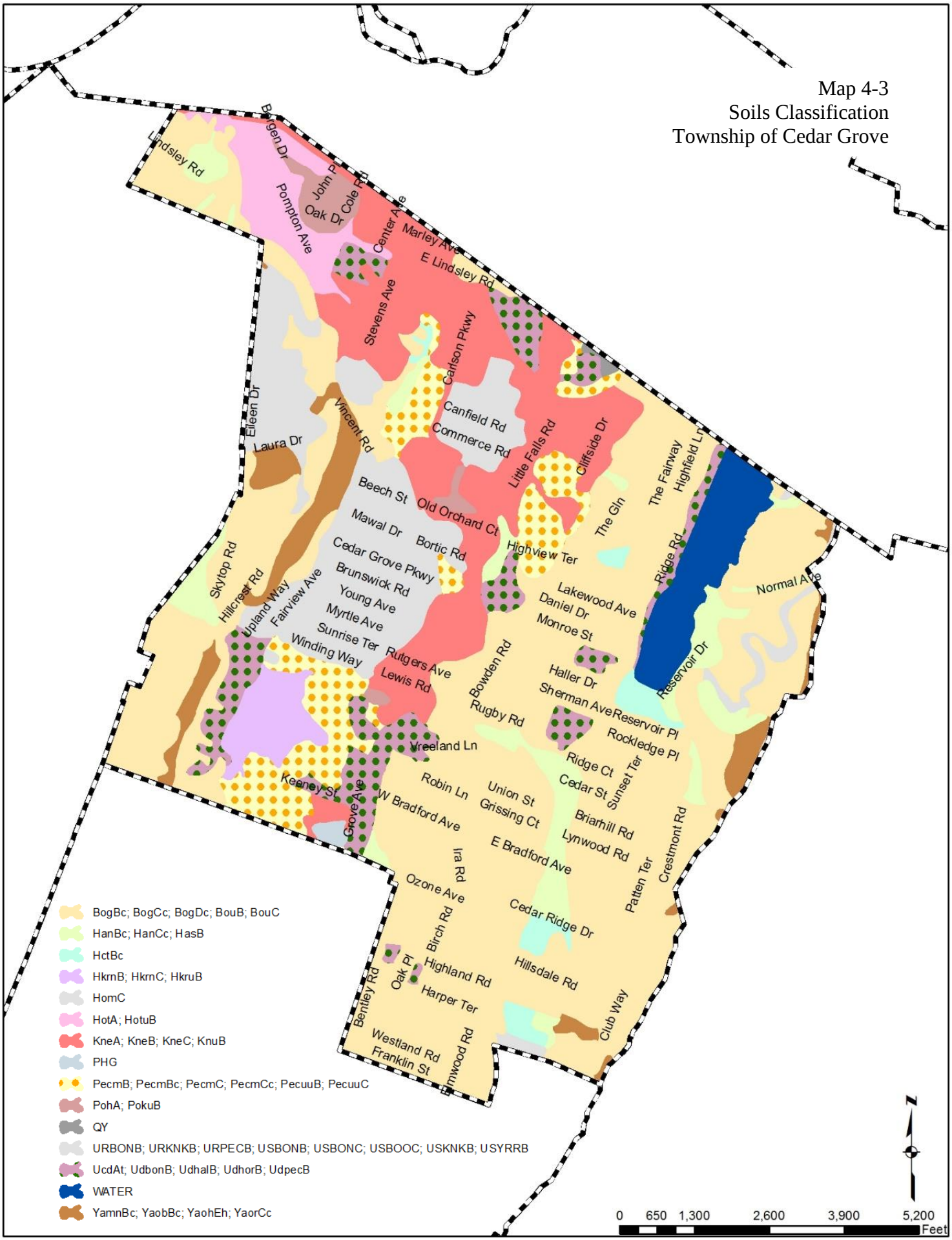


Table 4 – 3 :
Soil Classifications
Township of Cedar Grove

Soil	Map Unit Name	Acres	Percent
BogBc	Boonton loam, 0 to 8 percent slopes, extremely stony	316.0	11.3%
BogCc	Boonton loam, 8 to 15 percent slopes, extremely stony	164.7	5.9%
BogDc	Boonton loam, 15 to 35 percent slopes, extremely stony	63.8	2.3%
BouB	Boonton - Urban land, Boonton substratum complex, 0 to 8 percent slopes	598.2	21.4%
BouC	Boonton - Urban land, Boonton substratum complex, 8 to 15 percent slopes	179.6	6.4%
HanBc	Haledon silt loam, 0 to 8 percent slopes, extremely stony	61.8	2.2%
HanCc	Haledon silt loam, 8 to 15 percent slopes, extremely stony	18.5	0.7%
HasB	Haledon - Urban land, Haledon substratum complex, 0 to 8 percent slopes	47.2	1.7%
HctBc	Hasbrouck silt loam, 0 to 8 percent slopes, extremely stony	33.6	1.2%
HkrnB	Hinckley loamy sand, 3 to 8 percent slopes	16.5	0.6%
HkrnC	Hinckley loamy sand, 8 to 15 percent slopes	1.5	0.1%
HkruB	Hinckley - Urban land, Hinckley substratum complex, 0 to 8 percent slopes	28.3	1.0%
HomC	Holyoke - Rock outcrop complex, 3 to 15 percent slopes	18.5	0.7%
HotA	Horseneck sandy loam, 0 to 3 percent slopes	1.5	0.1%
HotuB	Horseneck - Urban land, Horseneck substratum complex, 0 to 8 percent slopes	71.2	2.6%
KneA	Knickerbocker fine sandy loam, 0 to 3 percent slopes	19.0	0.7%
KneB	Knickerbocker fine sandy loam, 3 to 8 percent slopes	27.9	1.0%
KneC	Knickerbocker fine sandy loam, 8 to 15 percent slopes	27.5	1.0%
KnuB	Knickerbocker - Urban land, Knickerbocker substratum complex, 0 to 8 percent slopes	277.7	9.9%
PecmB	Peckmantown silt loam, 3 to 8 percent slopes	54.6	2.0%
PecmBc	Peckmantown silt loam, 0 to 8 percent slopes, extremely stony	28.9	1.0%
PecmC	Peckmantown silt loam, 8 to 15 percent slopes	5.0	0.2%
PecmCc	Peckmantown silt loam, 8 to 15 percent slopes, extremely stony	18.5	0.7%
PecuuB	Peckmantown - Urban land, Peckmantown substratum complex, 0 to 8 percent slopes	39.1	1.4%
PecuuC	Peckmantown - Urban land, Peckmantown substratum complex, 8 to 15 percent slopes	7.8	0.3%
PHG	Pits, sand and gravel	5.2	0.2%
PohA	Pompton sandy loam, 0 to 3 percent slopes	9.8	0.3%
PokuB	Pompton - Urban land, Pompton substratum complex, 0 to 8 percent slopes	21.3	0.8%
QY	Pits, quarry	3.0	0.1%

Soil	Map Unit Name	Acres	Percent
UcdAt	Udifluvents, 0 to 3 percent slopes, frequently flooded	19.6	0.7%
UdbonB	Udorthents, Boonton substratum, 0 to 8 percent slopes	80.3	2.9%
UdhalB	Udorthents, Haledon substratum, 0 to 8 percent slopes	11.4	0.4%
UdhorB	Udorthents, Horseneck substratum, 0 to 8 percent slopes	15.0	0.5%
UdpecB	Udorthents, Peckmantown substratum, 0 to 8 percent slopes	21.7	0.8%
URBONB	Urban land, Boonton substratum, 0 to 8 percent slopes	16.3	0.6%
URKNKB	Urban land, Knickerbocker substratum, 0 to 8 percent slopes	44.6	1.6%
URPECB	Urban land, Peckmantown substratum, 0 to 8 percent slopes	1.2	0.0%
USBONB	Urban land, Boonton substratum - Boonton complex, 0 to 8 percent slopes	149.2	5.3%
USBONC	Urban land, Boonton substratum - Boonton complex, 8 to 15 percent slopes	24.7	0.9%
USBOOC	Urban land, Boonton substratum - Boonton complex, red sandstone lowland, 8 to 15 percent slopes	0.1	0.0%
USYRRB	Urban land, Yalesville substratum - Yalesville - Rock outcrop complex, 0 to 8 percent slopes	72.7	2.6%
WATER	Water	82.0	2.9%
YamnBc	Yalesville loam, 0 to 8 percent slopes, extremely stony	4.4	0.2%
YaobBc	Yalesville - Boonton - Holyoke complex, 0 to 8 percent slopes, extremely stony	12.7	0.5%
YaohEh	Yalesville - Holyoke complex, 35 to 60 percent slopes, very rocky	51.5	1.8%
YaorCc	Yalesville - Rock outcrop complex, 8 to 15 percent slopes, extremely stony	17.5	0.6%

Soil Series

The following soil series are present in the Township of Cedar Grove with the following characteristics:

Boonton Series

The Boonton soils are noted to consist of gently sloping to very steep, well-drained and moderately well-drained soils on upland. The SCS report indicates these soils formed in Wisconsin Age glacial deposits on the Watchung Mountains and on till plains between the mountains. This glacial till overlies diabase in the Watchungs and red shale and sandstone in areas between the Watchung Mountains. The glacial till may contain up to 20 percent granitic gneiss in addition to fragments of the underlying rock. Boonton soils are generally deep (40 to 60 inches) to bedrock on the watchungs and very deep (deeper than 60 inches) in till plain positions.

Typically, these soils have a dark brown or dark grayish brown silt loam surface layers, underlain by silt loam or loam subsoil layers containing from 15 to 20 percent gravel. Boonton soils on till plains generally have strong brown to reddish brown subsoils that display a noticeable increase in clay content. The lower portion of the subsoil is dense (fragipan) and may restrict water movement and root growth. Total thickness of the surface and subsoil layers (solum) ranges from 24 to 40 inches. The solum is underlain by loam or sandy loam. This layer generally contains 10 to 30 percent gravel by volume.

These soils are designated on the accompanying Soils Map as BoB, BoC, BoB, BsC, BsD, BsE, BsF, BuB, BuC, and BuD. The steepness of slope represents the distinguishing feature amongst these ten subcategories of Boonton Soils. Steep slopes represent the principal severe limitation to development of parcels containing this soils type. As noted on the soils map, Boonton Soils are distributed throughout the community.

Local Physiographic Area:	Watchung Mountain
Geomorphic Setting:	Till plain, ground moraine
Parent Material:	Coarse-loamy basal till derived from basalt
Drainage Class:	Well drained
Soil Depth Class:	Moderately deep to a fragipan layer Slope: 0 to 35 percent
Acres in Cedar Grove:	1,322.3
Percent of Municipality:	47.37

Haledon Series

The SCS date indicates that the Haledon soil series consists of gently sloping and sloping, somewhat poorly drained soils on uplands·that are deep to bedrock. These soils formed in material weathered from Wisconsin Age glacial till on undulating till plains and on foot slopes of basalt ridges. The till is composed dominantly of red and brown shale, sandstone and basalt, with some granitic gneiss.

Haledon soils typically have dark brown or dark grayish brown silt loam surface horizons underlain by brown to yellowish brown silt loam or loam subsoil layer. There is a noticeable increase of clay in the upper portion of the subsoil layers while a fragipan is present in the lower portion of this layer. The solum is generally 36 to 48 inches thick and overlies

a loam or sandy loam. The subsoil layers have gray mottles throughout. These soils typically contain between 5 and 20 percent gravel by volume throughout the solum. Also included are some areas where there is little. evidence of fragipan development.

Wetness conditions is characteristic of this soil series, and typically serves to impose severe limitations on building development. These soils are designated HaB, HaC and HsC on the SCS Soils Map. They typically exist in the central portion of town, as well as in the southernmost part of the township.

Local Physiographic Area:	Watchung Mountain
Geomorphic Setting:	Till plain, ground moraine
Parent Material:	Coarse-loamy basal till derived from basalt
Drainage Class:	Somewhat poorly drained
Soil Depth Class:	Moderately deep to a fragipan layer Slope: 0 to 15 percent
Acres in Cedar Grove:	127.5
Percent of Municipality:	4.57

Hasbrouck Series

This series consists of nearly level, poorly drained soils that are very deep to bedrock. The SCS document notes that these soils formed in material eroded from adjacent uplands and redeposited over Wisconsin Age glacial till. The original upland material was dominantly Wisconsin Age glacial till, which consists of primarily red and brown shale and sandstone with some basalt and granitic gneiss. Hasbrouck soils typically occupy depressions, drainage ways and narrow flood plains of small streams on uplands.

Hasbrouck soils typically have dark brown, very dark brown, or very dark grayish brown silt loam or loam surface horizons underlain by gray, brown or dark brown loam, silt loam, or fine sandy loam subsoil horizons. There is a noticeable increase in clay in the lower portion of the subsoil layers. A fragipan·exists in the lower portion of the solum. Depth to fragipan ranges from 16 to 20 inches.

Wetness conditions are characteristic of this soil series. This feature tends to impose severe limitations to development. The Hasbrouck soils are designated HvA on the accompanying Soils Map. This soil type is found in limited areas in the northeast portion of the Township.

Local Physiographic Area:	Watchung Mountain
Geomorphic Setting:	Till plain, depression
Parent Material:	Fine-loamy eroded and redeposited glacial material over glacial till
Drainage Class:	Poorly drained
Soil Depth Class:	Shallow to a fragipan layer
Slope:	0 to 8 percent
Acres in Cedar Grove:	33.6
Percent of Municipality:	1.2

Hinckley Series
The Hinckley series consists of very deep, excessively drained soils formed in glaciofluvial materials. They are nearly level through very steep soils on outwash terraces, outwash plains, outwash deltas, kames, kame terraces, and eskers. Saturated hydraulic conductivity is high or very high. Slope ranges from 0 to 60 percent. Excessively drained. Surface runoff is negligible through low. Saturated hydraulic conductivity is high or very high.

Local Physiographic Area:	Passaic Basin Geomorphic
Setting:	Delta plain, esker
Parent Material:	Sandy-skeletal soils formed in water-sorted sand and gravel derived principally from granite, gneiss, basalt, and red sandstone
Drainage Class:	Excessively drained
Soil Depth Class:	Very deep Slope: 0 to 15 percent
Acres in Cedar Grove:	46.3
Percent of Municipality:	1.66

Holyoke Series
The Holyoke series consists of shallow, well drained and somewhat excessively drained soils formed in a thin mantle of till derived mainly from basalt and red sandstone, conglomerate, and shale. They are nearly level to very steep soils on bedrock controlled ridges and hills. Slope ranges from 0 to 60 percent. Saturated hydraulic conductivity is moderately high to very high. Soil is well drained and somewhat excessively drained. Surface runoff is medium to very rapid. Saturated hydraulic conductivity is moderately high to very high.

Local Physiographic Area:	Watchung Mountain
Geomorphic Setting:	Ground moraine, till plain, hill, ridge
Parent Material:	Loamy till derived from basalt
Drainage Class:	Well drained
Soil Depth Class:	Shallow to a bedrock (lithic) layer Slope: 0 to 60 percent
Acres in Cedar Grove:	18.5
Percent of Municipality:	0.66

Horseneck Series
The Horseneck series consists of very deep, moderately well drained soils formed in glaciofluvial deposits derived primarily from granitic materials on outwash plains, deltas, and lake basins. Slope ranges from 0 to 15 percent. Permeability is moderate or moderately rapid in the solum and moderately rapid to very rapid in the substratum. Soils are moderately well drained. Runoff is low to medium. Permeability is moderate or moderately rapid in the solum and rapid or very rapid in the substratum. The ground water table is within 40 inches of the surface in late winter and early spring and following extended periods of significant rainfall.

Local Physiographic Area:	Passaic Basin
Geomorphic Setting:	Delta plain, outwash plain
Parent Material:	Coarse-loamy outwash derived from gneiss, basalt, and sandstone
Drainage Class:	Moderately well drained
Soil Depth Class:	Very deep Slope: 0 to 8 percent
Acres in Cedar Grove:	72.7
Percent of Municipality:	2.6

Knickerbocker Series
The Knickerbocker series consists of very deep, well and somewhat excessively drained, soils formed in sandy glacio-fluvial deposits. They are nearly level to steep soils on lake plains and terraces. Slope ranges from 0 to 35 percent. This soil is well or somewhat excessively drained. The potential for surface runoff is low to high. Permeability is moderately rapid in the upper part of the solum and moderately rapid to very rapid in the lower part of the solum and substratum.

Local Physiographic Area:	Passaic Basin
Geomorphic Setting:	Terrace, lake plain
Parent Material:	Sandy outwash
Drainage Class:	Well drained
Soil Depth Class:	Very deep
Slope:	0 to 15 percent
Acres in Cedar Grove:	352.1
Percent of Municipality:	12.61

Peckmantown Series
The Peckmantown series consists of very deep, well drained soils that formed in stratified glaciolacustrine and glaciofluvial sediments. They are moderately deep to a fragipan. Slope ranges from 0 to 15 percent. Permeability is moderately rapid in the A and Bt horizons, slow or very slow throughout the fragipan and moderately rapid to very rapid in the substratum. This soil is well drained. Permeability is moderately rapid in the surface horizons, slow or very slow throughout the fragipan, and moderately rapid to very rapid in the substratum. Saturated hydraulic conductivity is high in the surface horizons, low to moderately high in the fragipan, and high or very high in the substratum.

Local Physiographic Area:	Peckman River Valley
Geomorphic Setting:	Delta plain, outwash plain
Parent Material:	Coarse-silty glaciolacustrine deposits derived from basalt
Drainage Class:	Well drained
Soil Depth Class:	Moderately deep to a fragipan layer
Slope:	0 to 15 percent
Acres in Cedar Grove:	153.9
Percent of Municipality:	5.51

Pompton Series
The Pompton series consists of very deep, moderately well drained and somewhat poorly drained soils formed in water-sorted sediments. They are on outwash plains, relict beaches, and terraces in waterways and low positions. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity is high in the solum and high or very high in the substratum. This soil is moderately well drained and somewhat poorly drained. Saturated hydraulic conductivity is high in the solum and high or very high in the substratum. Surface runoff is very low or low. The ground water table is within 30 centimeters of the surface in the late winter and early spring and following periods of extended rainfall.

Local Physiographic Area:	Passaic Basin
Geomorphic Setting:	Delta plain, outwash plain
Parent Material:	Coarse-loamy outwash derived from gneiss, sandstone, and basalt
Drainage Class:	Somewhat poorly drained
Soil Depth Class:	Very deep
Slope:	0 to 8 percent
Acres in Cedar Grove:	31.1
Percent of Municipality:	1.11

Udorthents
Udorthents consists of areas that have been subjected to considerable earth moving activities during grading, cut and fill, and/or other types of human disturbance for residential development, commercial and industrial buildings, cemeteries, and recreational areas. Human artifacts and coal ash are commonly found mixed with the soil material.

Acres in Cedar Grove:	128.4
Percent of Municipality:	4.6

Yalesville Series
The Yalesville series consists of moderately deep, well drained soils formed in a loamy till. They are nearly level to moderately steep soils on hills and ridges. Slope ranges from 0 to 50 percent. Saturated hydraulic conductivy is moderately high or high in the solum and high in the substratum. This soil is well drained. Surface runoff is negligible to very high. Saturated hydraulic conductivy is moderately high or high in the solum and high in the substratum.

Local Physiographic Area:	Watchung Mountain
Geomorphic Setting:	Till plain, ground moraine
Parent Material:	Coarse-loamy till derived from basalt
Drainage Class:	Well drained
Soil Depth Class:	Moderately deep to a bedrock (lithic) layer
Slope:	0 to 60 percent
Acres in Cedar Grove:	86.1
Percent of Municipality:	3.08

Contaminated Sites

Soil and groundwater contamination by pollutants is tracked by the state and federal governments at varying degrees of contamination or potential contamination, including brownfields and other extensive or long-term remediation, point source facilities that require continuous monitoring (Community Right to Know) and point source occurrences that are specific and limited (Known Contaminated Sites).

The NJDEP Site Remediation Program currently maintains a list of more than 12,000 New Jersey Sites that have confirmed contamination and are undergoing remedial investigation, cleanup, or awaiting assignment of a Licensed Site Remediation Professional (LSRP). These sites include private residences, active / abandoned manufacturing / commercial properties, and gas stations. The list does not include sites that have been successfully remediated.

Brownfields

A brownfield is "any former or current commercial or industrial site, currently vacant or underutilized and on which there has been, or there is suspected to have been, a discharge of a contaminant." (*Brownfield and Contaminated Site Remediation Act,* N.J.S.A. 58:10B-1 et seq.) According to the State of New Jersey Brownfields Site mart, there are 10 active sites in the Township of Cedar Grove.

Table 4 – 4 :
Brownfield Locations
Township of Cedar Grove

Site Name	*Location*
FLEET MANAGEMENT	99 W BRADFORD AVE
TEXACO SERVICE STATION # 100123	666 POMPTON AVE
MW JENKINS SONS INCORPORATED	444 POMPTON AVE
SERVOMETER CORP	501 LITTLE FALLS RD
ROSEMOUNT ANALYTICAL INC	89 COMMERCE RD
HOSPITAL CENTER FIREHOUSE	FAIRVIEW AVE
ESSEX CNTY HOSPITAL CENTER COMPLEX	120 FAIRVIEW AVE
ESSEX COUNTY SANITORIUM SWDA	W BRADFORD AVE
GENESIS WATERVIEW CARE CENTER	536 RIDGE RD
HARDMAN INCORPORATED	12 CLIFFSIDE DR

Source: https://www.njbrownfieldsproperties.com

Table 4 – 5 :
Active and Pending Contaminated Sites
Township of Cedar Grove

Name	Address	LEAD	Category
CEDAR GROVE GROUND WATER CONTAMINATION	LITTLE FALLS RD	Pending	B
SITE #31665	379 POMPTON AVE	LSRP	A
3 6 CLIFFSIDE DRIVE	3 6 CLIFFSIDE DR	LSRP	A
TEXACO SERVICE STATION # 100123	666 POMPTON AVE	LSRP	A
25 BORTIC RD LAST	25 BORTIC RD	Pending	A
FLEET MANAGEMENT	99 W BRAFDORD AVE	LSRP	A
LH ENTERPRISES	256 POMPTON AVE	LSRP	A
BUDDS AUTO BODY INC	1416 POMPTON AVE		
FORMER ESSEX COUNTY HOSPITAL COMPLEX	FAIRVIEW AVE		
KILLION EXTRUDERS	200 COMMERCE RD		
R.P CARGILLE LABORATORIES INC	55 COMMERCE RD		

A Site with on sites sources of contamination
B Site with unknown sources of contamination.

Table 4 – 6 :
Closed (Non Homeowner) Contaminated Sites
Township of Cedar Grove

Name	Location
10 ROSE TERRACE	10 ROSE TER
112 WESTLAND ROAD	112 WESTLAND RD
122 BOWDEN ROAD	122 BOWDEN RD
130 SHERMAN AVENUE	130 SHERMAN AVE
16 MOUNTAIN AVENUE SOUTH	16 MOUNTAIN AVE
17 DEVONSHIRE RD S	17 S DEVONSHIRE RD
218 STEVENS AVE	218 STEVENS AVE
22 1ST AVENUE	22 1ST AVE
23 SWEETWOOD DRIVE	23 SWEETWOOD DR
240 GROVE AVENUE	240 GROVE AVE
26 SWEETWOOD DRIVE	26 SWEETWOOD DR
27 SWEETWOOD DR	27 SWEETWOOD DR
30 SWEETWOOD DR	30 SWEETWOOD DR
3 CLARA PLACE	3 CLARA PL
515 POMPTON AVENUE	515 POMPTON AVE
574 586 POMPTON AVENUE	574 586 POMPTON AVE
86 SHERMAN AVENUE	86 SHERMAN AVE
93 MYRTLE AVENUE	93 MYRTLE AVE
99 MYRTLE AVENUE	99 MYRTLE AVE
ARBOR GLEN CARE & REHAB CENTER	POMPTON AVE & E LINDSEY RD
BISHOP ELECTRIC CORPORATION	10 CANFIELD RD
CEDAR GROVE HIGH SCHOOL	90 RUGBY RD
CHAPEL ON THE HILL	560 RIDGE RD
DPW-WASTEWATER TREATMENT PLANT	340 LITTLE FALLS RD
ESSEX CNTY HOSPITAL CENTER COMPLEX	120 FAIRVIEW AVE
ESSEX CNTY POLICE ACADEMY	250 GROVE AVE
ESSEX CO OLD FIREHOUSE	125 FAIRVIEW AVE
ESSEX COUNTY HOSPITAL STP	W BRADFORD AVE
ESSEX COUNTY SANITORIUM SWDA	W BRADFORD AVE
GENESIS WATERVIEW CARE CENTER	536 RIDGE RD
GENPAK LLC	11 CLIFFSIDE DR
GOLDEN TOWER RESTAURANT	1027 POMPTON AVE
GREATER HILLTOP PROPERTY	MOUNTAIN AVE & ELM RD
HARDMAN INC	10 CLIFFSIDE DR
HILLCREST MOBIL	648 POMPTON AVE
HOSPITAL CENTER FIREHOUSE	FAIRVIEW AVE
KEMP BUILDING	1384 POMPTON AVE
LUONGO BUILDING	673 POMPTON AVE
MIKE SINISI GETTY	115 E BRADFORD AVE
PECKMAN RIVER HEATING OIL DISCHARGE	OZONE AVE
PISTOL RANGE	450 POMPTON AVE
PSE&G CEDAR GROVE NATURAL GAS LCP	VARIOUS STREETS
PSE&G NEGP ELECTRIC TRANSMISSION TOWER 5/5	LITTLE FALLS RD
PSE&G NEGP RIGHT OF WAY TOWER 5/1	BOWDEN RD
RAE LITHOGRAPHERS INC	282 GROVE AVE
RESERVOIR RIDGE CONDOMINIUMS	NORMAL AVE
SEKHON 23 GAS INC	600 POMPTON AVE
SERVOMETER CORP	501 LITTLE FALLS RD
SOUTH END SCHOOL	116 HARPER TER
STICKEL BUILDING	571 POMPTON AVE

Watersheds

"A watershed is a topographic area within which apparent surface water runoff drains into a specific point on a stream or to a water body such as a lake." (*EPA, Ecoregions and Watersheds 1997*). The NJDEP has divided the state into Watershed Management Areas (WMAs). A watershed-based approach to natural resource management is considered by state and national agencies to be the most appropriate unit for managing complex environmental problems.

Cedar Grove is located in WMA 4 and a small portion in WMA 6.

Watershed Management Area 4 includes the Lower Passaic River (from the Pompton River confluence downstream to the Newark Bay) and its tributaries, including the Saddle River. The WMA 4 drainage area is approximately 180 square miles and lies within portions of Passaic, Essex, Hudson, Morris and Bergen Counties.

Two watersheds comprise WMA 4: the Lower Passaic River Watershed and Saddle River Watershed. The Lower Passaic River Watershed originates from the confluence of the Pompton River downstream to the Newark Bay. This 33-mile section meanders through Bergen, Hudson, Passaic and Essex Counties and includes a number of falls, culminating with the Great Falls in Paterson. This watershed has a drainage area of approximately 129 square miles. The major tributaries to this section of the Passaic River are the Saddle River, Preakness Brook, Second River and Third River. The Saddle River is one of the larger tributaries to the Lower Passaic River. The Saddle River Watershed has a drainage area of approximately 51 square miles. Land in this watershed is extensively developed and contains many older cities and industrial centers including Newark, Paterson, Clifton and East Orange.[1]

Watershed Management Area 6 represents the area drained by waters from the upper reaches of the Passaic River Basin including the Passaic River from its headwaters in Morris County to the confluence of the Pompton River. WMA 6 is characterized by extensive suburban development and reliance upon ground water sources for water supply. WMA 6 lies in portions of Morris, Somerset, Sussex and Essex Counties and includes the Upper and Middle Passaic River, Whippany River and Rockaway River Watersheds.[2]

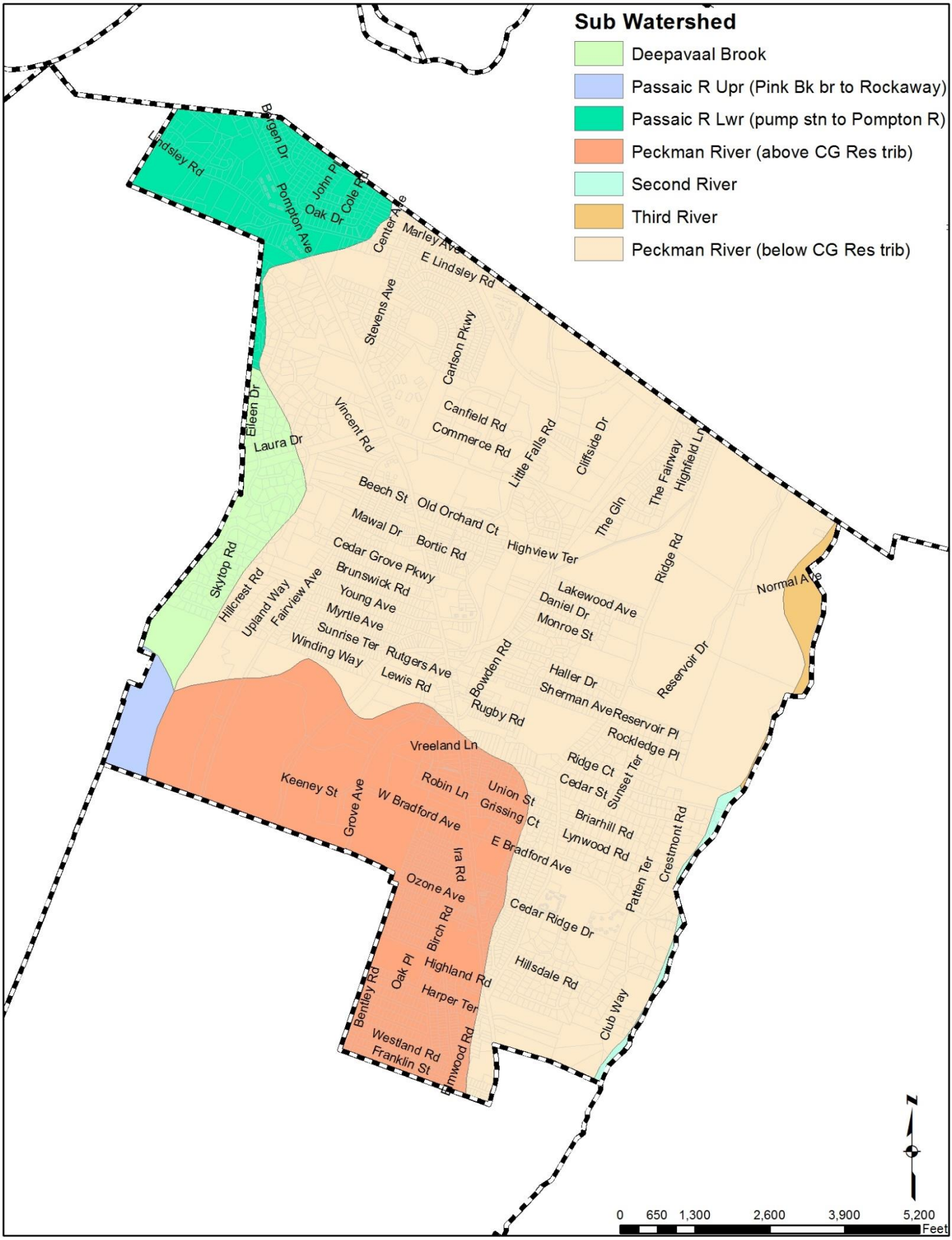
Every WMA is composed of multiple watersheds and sub watersheds. The United States Geological Survey (USGS) has mapped and identified watersheds using a hierarchical numbering system. This system identifies watersheds using hydrological unit code (HUC) consisting of up to 14 digits for the smallest watersheds. The HUC14 watersheds for Cedar Grove Township are identified on the *Watershed* map.

[1] http://www.nj.gov/dep/watershedrestoration/wma4_info.html
[2] http://www.nj.gov/dep/watershedrestoration/wma6_info.html

Table 4 – 7 :
HUC 14 Watersheds
Township of Cedar Grove

WMA	*WMA Name*	*Sub-Watersheds*	*Acres*	*Percent*
04	Lower Passaic and Saddle	Deepavaal Brook	109.69	3.93%
04	Lower Passaic and Saddle	Peckman River (below CG Res trib)	23.78	0.8%
04	Lower Passaic and Saddle	Third River	1925.02	68.99%
06	Upper Passaic, Whippany, and Rockaway	Passaic R Upr (Pine Bk br to Rockaway)	31.4	1.13%
04	Lower Passaic and Saddle	Peckman River (above CG Res trib)	523.37	18.76%
04	Lower Passaic and Saddle	Passaic R Lwr (pump stn to Pompton R)	177	6.34%

Source: NJDEP Note: Due to rounding, numbers may differ from recorded totals


Sub Watershed
Deepavaal Brook
Passaic R Upr (Pink Bk br to Rockaway)
Passaic R Lwr (pump stn to Pompton R)
Peckman River (above CG Res trib)
Second River
Third River
Peckman River (below CG Res trib)
Bergen Dr
Lindsley Rd
John P
Cole Rd
Oak Dr
Pompton Ave
Center Ave
Marley Ave
E Lindsley Rd
Stevens Ave
Carlson Pkwy
Eileen Dr
Laura Dr
Vincent Rd
Canfield Rd
Commerce Rd
Little Falls Rd
Cliffside Dr
The Fairway
Highfield Ln
The Gln
Ridge Rd
Beech St
Old Orchard Ct
Mawal Dr
Bortic Rd
Highview Ter
Cedar Grove Pkwy
Brunswick Rd
Young Ave
Myrtle Ave
Sunrise Ter
Winding Way
Rutgers Ave
Lewis Rd
Skytop Rd
Hillcrest Rd
Upland Way
Fairview Ave
Lakewood Ave
Daniel Dr
Monroe St
Normal Ave
Bowden Rd
Rugby Rd
Haller Dr
Sherman Ave
Reservoir Dr
Reservoir Pl
Rockledge Pl
Vreeland Ln
Ridge Ct
Sunset Ter
Cedar St
Robin Ln
Union St
Grissing Ct
Keeney St
Grove Ave
W Bradford Ave
Briarhill Rd
Lynwood Rd
E Bradford Ave
Crestmont Rd
Patten Ter
Ira Rd
Ozone Ave
Birch Rd
Cedar Ridge Dr
Oak Pl
Highland Rd
Harper Ter
Hillsdale Rd
Bentley Rd
Westland Rd
Franklin St
Club Way
N
0 650 1,300 2,600 3,900 5,200
Feet

Surface Water

New Jersey's Surface Quality Standards (SWQS) (N.J.A.C. 7:9) classify Fresh Water 1 (FW1) as the highest level of classification, which is defined as:

"those fresh waters, as designated in N.J.A.C. 7:9B-1.15(j), that are to be maintained in their natural state of quality (set aside for posterity) and not subjected to any manmade wastewater discharges or increase in runoff from anthropogenic activities. These waters are set aside for posterity because of their clarity, color, scenic setting, other characteristic of aesthetic value, unique ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resource(s)."

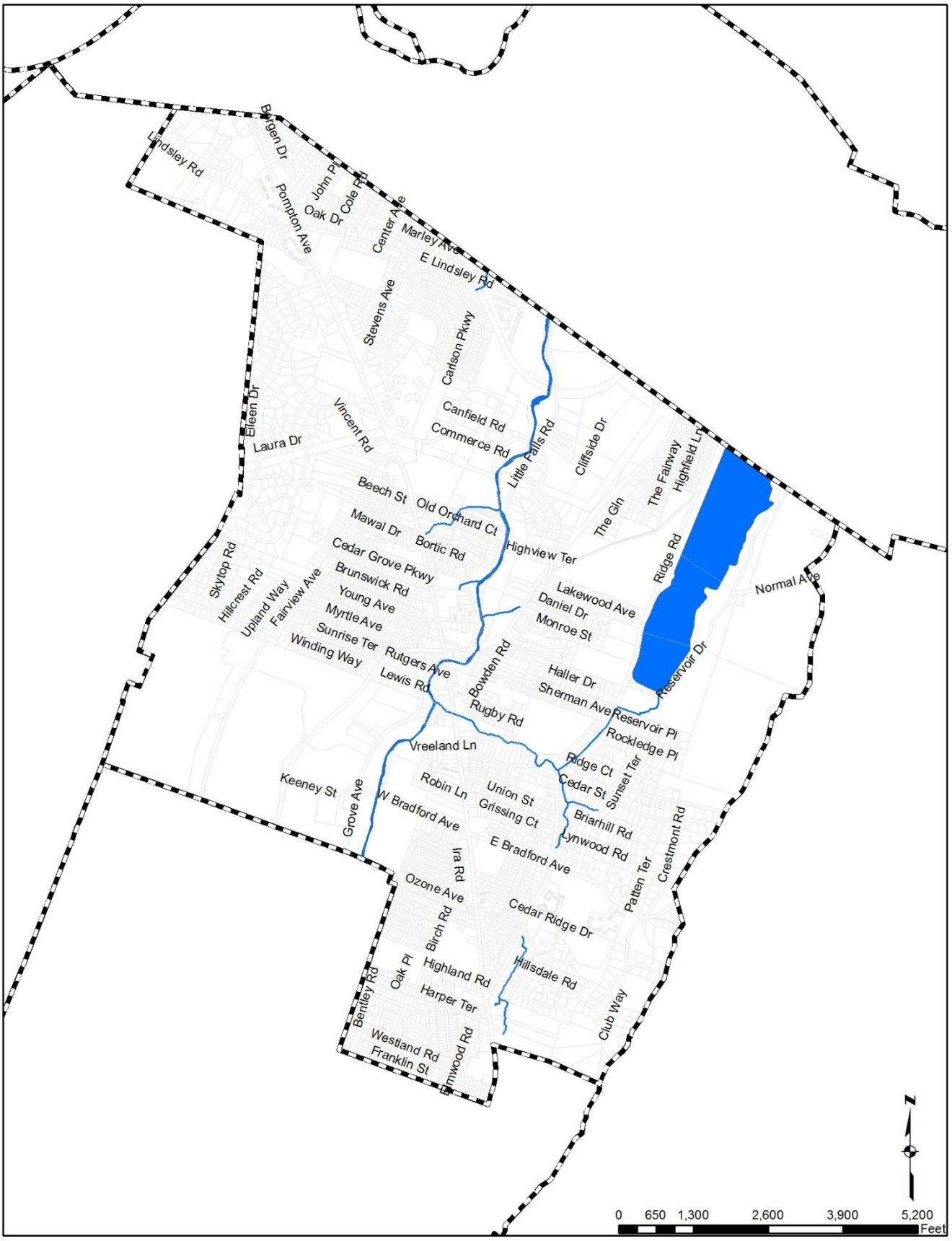
The general classification for other fresh waters in the State is Fresh Water 2 (FW2). Further classifying these water bodies, the presence of trout in a stream means that the waters are relatively free of chemical or biological contaminants. A stream can be classified as Trout Production (TP), Trout Maintenance (TM), or Non-Trout (NT). Trout Production waters are designated "for use by trout for spawning or nursery purposes during their first summer." Trout Maintenance waters support trout throughout the year.

Waters classified as Non-Trout do not support trout, either because of their physical nature or due to biological or chemical characteristics. The rivers and streams of Cedar Grove Township have been classified by the NJDEP as FW2-NT waterways.

The quality of surface waters can be affected by point sources and non-point sources of pollution as well as from erosion and sedimentation. Point source means any discernible, confines and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. (*Clean Water Act, 1972*) This includes discharges from sewage treatment plants and factories, storm water runoff, illegal dumping, and malfunctioning underground storage tanks and septic systems. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.

As opposed to point source pollution, non-point source pollution comes from many different sources. As rainfall or snowmelt moves over and through the ground, it picks up and carries natural and human-made pollutants (such as fertilizers, herbicides and motor oil) and deposits them into surface and groundwater.

The effects of pollutants on specific waterways can vary, but are manifested in drinking water supplies, recreation, fisheries, and wildlife. One of these effects is eutrophication, which, in freshwater systems, is the addition of substances, either man-made or natural, to a water body affecting the primary productivity of that body of water. Substances such as nitrates and phosphates promote excessive algae and phytoplankton growth. These "blooms" can have negative effects on the ecosystem. These negative impacts can include a clouding of the water, which limits sunlight penetration, stopping the growth of plants deeper in the water. Additionally, eutrophication can lead to anoxia, a condition where a water body has depleted levels of oxygen, which is the result of the decomposition of dead phytoplankton.


Lindsley Rd
Bergen Dr
John P
Cole Rd
Oak Dr
Pompton Ave
Center Ave
Marley Ave
E Lindsley Rd
Stevens Ave
Carlson Pkwy
Eileen Dr
Laura Dr
Vincent Rd
Canfield Rd
Commerce Rd
Little Falls Rd
Cliffside Dr
The Fairway
Highfield Ln
Beech St
Old Orchard Ct
Mawal Dr
Bortic Rd
Highview Ter
The Gln
Ridge Rd
Normal Ave
Skytop Rd
Hillcrest Rd
Upland Way
Fairview Ave
Cedar Grove Pkwy
Brunswick Rd
Young Ave
Myrtle Ave
Sunrise Ter
Winding Way
Rutgers Ave
Lewis Rd
Lakewood Ave
Daniel Dr
Monroe St
Bowden Rd
Haller Dr
Sherman Ave
Reservoir Dr
Reservoir Pl
Rockledge Pl
Rugby Rd
Vreeland Ln
Ridge Ct
Sunset Ter
Cedar St
Keeney St
Grove Ave
Robin Ln
Union St
Grissing Ct
W Bradford Ave
Briarhill Rd
Lynwood Rd
E Bradford Ave
Crestmont Rd
Patten Ter
Ira Rd
Ozone Ave
Cedar Ridge Dr
Birch Rd
Oak Pl
Highland Rd
Hillsdale Rd
Bentley Rd
Harper Ter
Club Way
Westland Rd
Franklin St
Elmwood Rd
N
0 650 1,300 2,600 3,900 5,200
Feet

Water quality can also be negatively impacted by sedimentation which is the transportation and deposition of eroded materials. A primary cause of sedimentation is development near streams and on steep slopes that reduces vegetative cover and results in exposed soil. The vegetative cover can typically absorb the impact of raindrops, but when it is removed, the exposed soil will easily become eroded which then can then be transported to surface waters where it could contaminate and increase the turbidity of the water, effectively blocking sunlight to plant species and negatively affecting the health of the aquatic ecosystem.

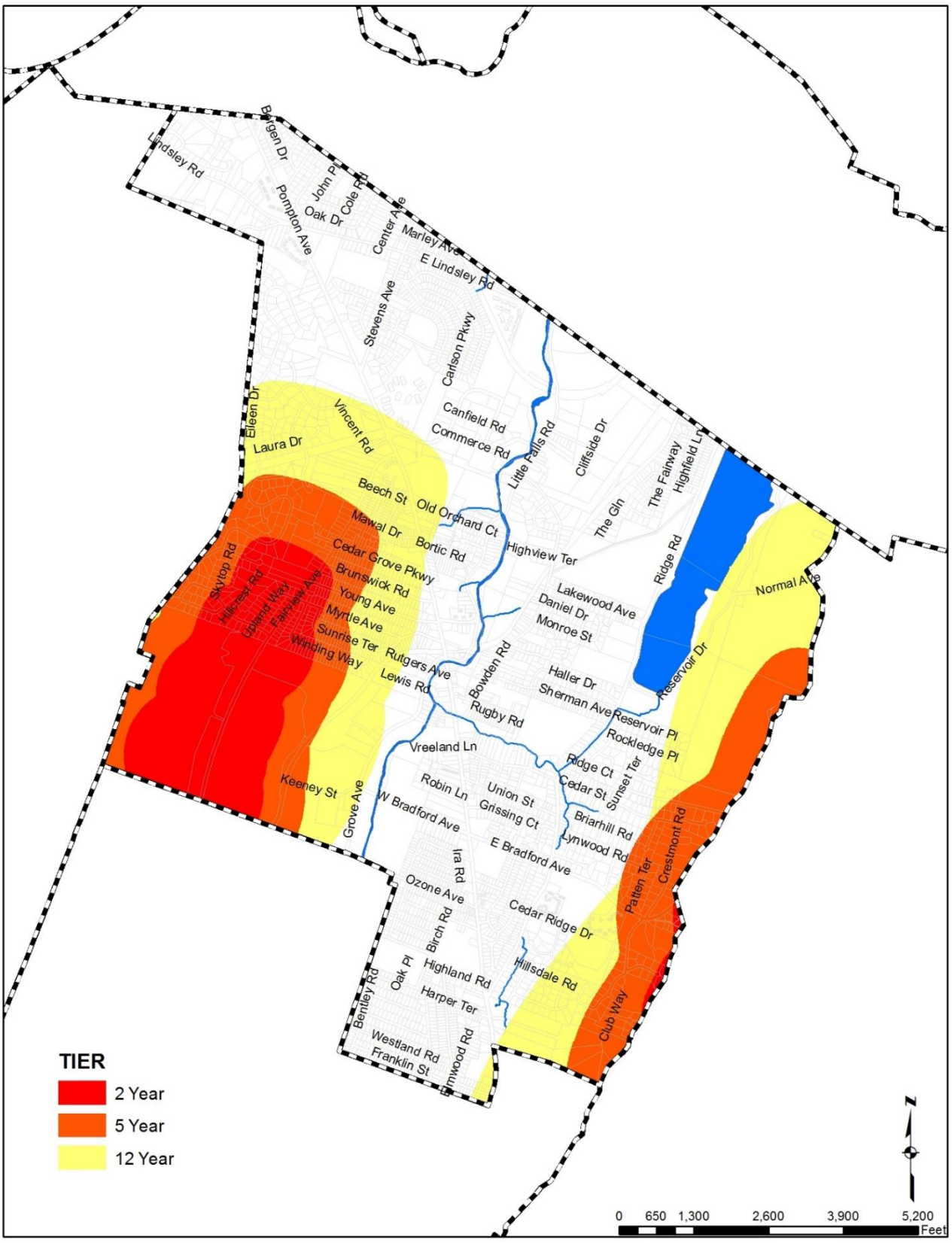
Public Water Supply and Wellhead Protection

The 1986 Federal Safe Drinking Water Act Amendments (*Section 1428, P.L. 23-523, 42 USC 300 et seq.*) direct all states to develop a Well Head Protection Program (WHPP) Plan for both public community (CWS) and public non-community (NCWS) water supply wells. A component of the WHPP is the delineating of Well Head Protection Areas. This delineation is the first step in defining the sources of water to a public water supply in order to prevent and clean up groundwater contamination.

Well Head Protection Areas (WPAs) are delineated for both public community and noncommunity wells. The delineations for these wells are the two, five, and twelve year tiers. Each tier represents the horizontal extent of groundwater captured by a well pumping at a specific rate over those periods of time. (*NJDEP*).

There are two wellhead protection areas that encompasses almost 30 percent of the Township. The eastern protection of the town is in the wellhead protection zone related to a well located in Montclair north of Bellevue Avenue. The western portion of the Township falls in a wellhead protection area of the Essex County Utilities Authority (ECUA) owned wells along Fairview Avenue.

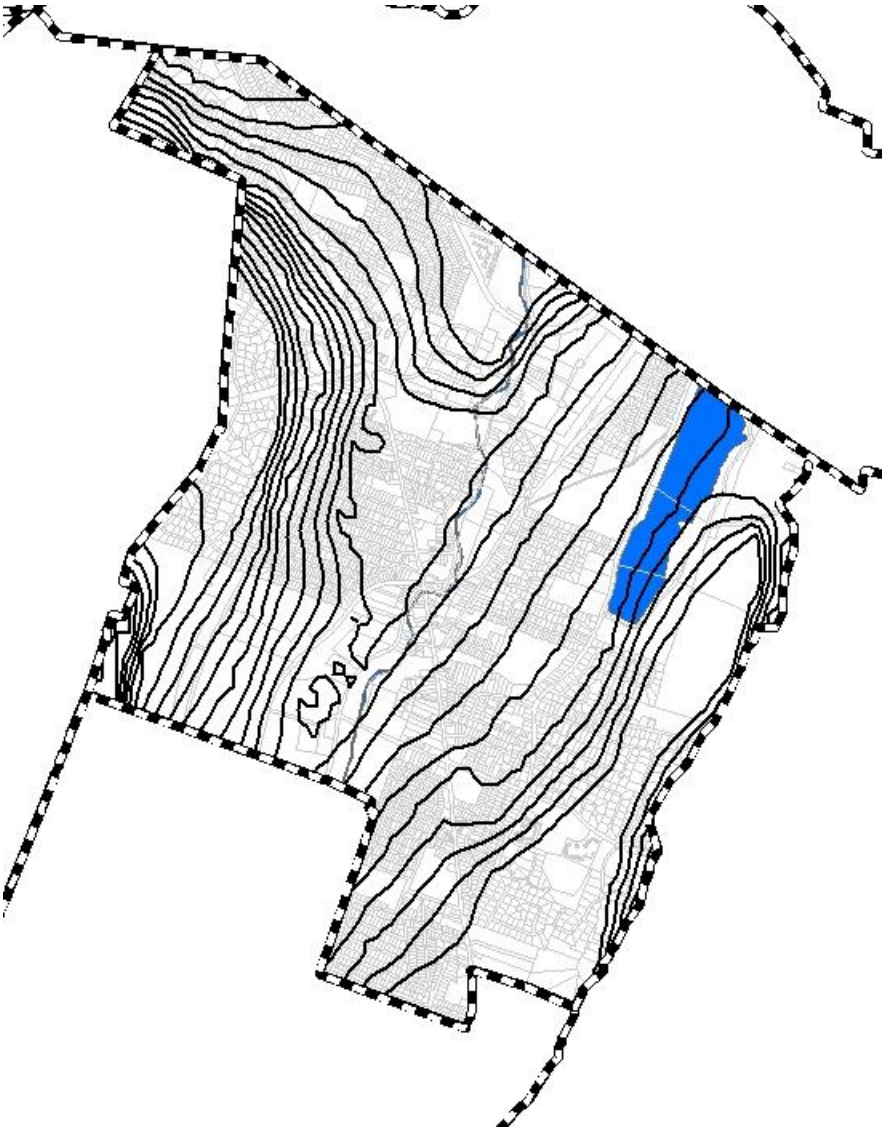
Map 4-5
Public Wellhead Protection Areas
Township of Cedar Grove



Topography

The topography of Cedar Grove is detailed on the map below. The lowest elevation of Cedar Grove is at the Northwestern portion of the municipality recorded at 498 feet above sea level. The highest elevation in Cedar Grove is located along the southwestern portion of the town at 600 feet above sea level.

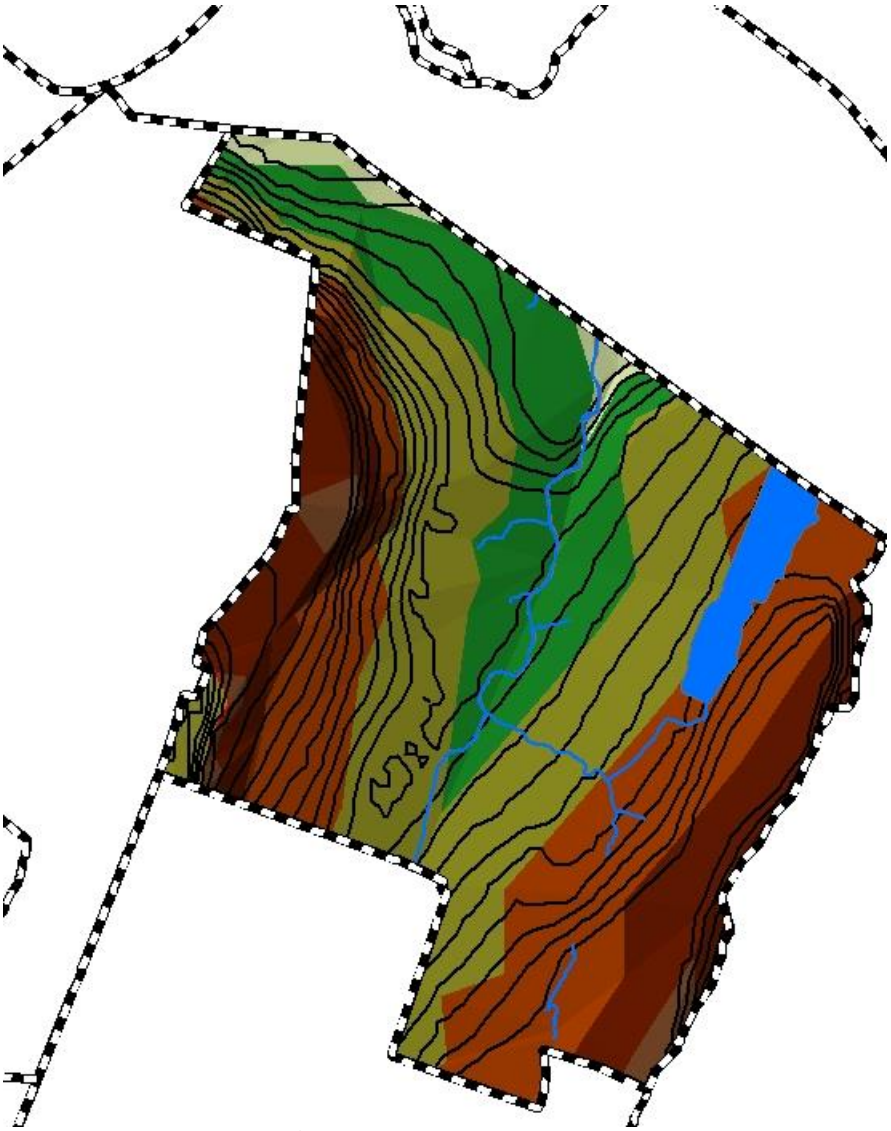
Map 4 – 6 :
Topography
Township of Cedar Grove



Source: New Jersey Department of Environmental Protection

Map 4 - 9 illustrates a relief map of Cedar Grove constructed from the topographic digital elevation model (DEM). This map clearly illustrates the complex topography found though out this municipality.

Map 4 – 7 :
Relief Map
Township of Cedar Grove



Source: New Jersey Department of Environmental Protection

Slopes

The slope of land is a determining factor to the development potential. Slopes that exceed 15 percent have been identified by the Council On Affordable Housing (COAH) as lands that are inappropriate for low and moderate income housing as it presents too many constraints for building such housing. Steep sloping lands become highly erodible and if improperly developed, can loosen, becoming a hazard. Slopes exceeding 15 percent have generally been accepted throughout New Jersey as a limiting factor to development. Sloping land with 15 percent slopes represents an eight-degree change in land. This is illustrated in the diagram below.

Visual Examples
of slopes.