

Millstone Township Natural Resource Inventory

November 2, 2026

ADOPTED BY PLANNING BOARD:

Prepared by MJ Planning LLP

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November 2, 2026

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The original of this report was appropriately signed and sealed in accordance with N.J.S.A. 45:14A.

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Note on Data Used in this Plan:

All maps and tables are derived from publicly available data sources, some of which have been updated for this project based on knowledge of local conditions. The source of data has been noted on the maps.

Portions of This Plan were developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.

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INTRODUCTION

Millstone Township most recently prepared a comprehensive Natural Resource (NRI) / Environmental Resource Inventory (ERI) in 2006. That document consolidated and built on several prior reports including NRIs prepared in 1991 and 1992, a Watershed Assessment report in 2002, and an evaluation of Groundwater Resources in 2003. The 2017 Master Plan Reexamination Report also included a brief review of the NRI. While this document updates and, in most ways, supersedes the 2006 NRI / ERI, that document remains a valuable resource for the in-depth review of the vegetation, wildlife, and threatened and endangered species in the Township that is not reproduced in the same level of detail as part of the 2026 update.

While Millstone remains a low-density suburban and rural township, there have been both residential and non-residential developments over the past two decades that have impacted the natural environment and the Township's environmental resources. The location and scale of development opportunities in the Township continue to be constrained by the lack of public sewer and water infrastructure and extensive regulated environmental features, but there continues to be local and regional development pressure for both residential and non-residential uses.

The updated NRI/ERI will help the Township continue to advance its broader goals and objectives related to environmental preservation, conservation, and land stewardship. As an element of the Township's Master Plan, this document will help the Governing Body formulate policies and the Planning Board, and Zoning Board of Adjustment evaluate applications for development.

The NRI / ERI identifies the significant natural resources in the Township, including but not limited to topography and soils, surface water, groundwater, habitat, air quality, and climate. The Township's built environment is also reviewed in the context of its impact on changing natural conditions over time. Preserved open space and recreational facilities and farmland may be the result of human intervention but contribute to the enhancement of natural resources in the Township. Environmentally sensitive areas, including those contaminated through historic human activities are also a critical consideration when prioritizing resources for preservation, remediation, and development.

The data utilized in this report comes from New Jersey state agencies including the Department of Environmental Protection and Office of Geographic Information Systems, and national sources including the United States Department of Agriculture and Natural Resources Conservation Service. Reports from educational institutions and other reputable sources also provide important background. The information in this report reflects the best available and most current data publicly available at the time it was drafted. Conditions will evolve as development and preservation activities take place and broader climactic changes continue to occur. The NRI / ERI is adopted as an element of the Township's Master Plan and should be reviewed and updated on a regular schedule as the Master Plan is reexamined and amended.

REGIONAL LOCATION

Millstone Township is located in the western portion of Monmouth County in central New Jersey. The Township is situated at the confluence of four counties with Jackson Township in Ocean County to the southeast, Monroe Township in Middlesex County to the north, and East Windsor Township in Mercer County to the northwest. The Township mostly wraps around the neighboring Borough of Roosevelt and also borders Manalapan, Freehold and Upper Freehold in Monmouth County.

The Township is just over 37 square miles in area, nearly all of which is land. The most recent American Community Survey (2024 5-Year ACS) population estimate is 10,385 residents, which is an increase of about

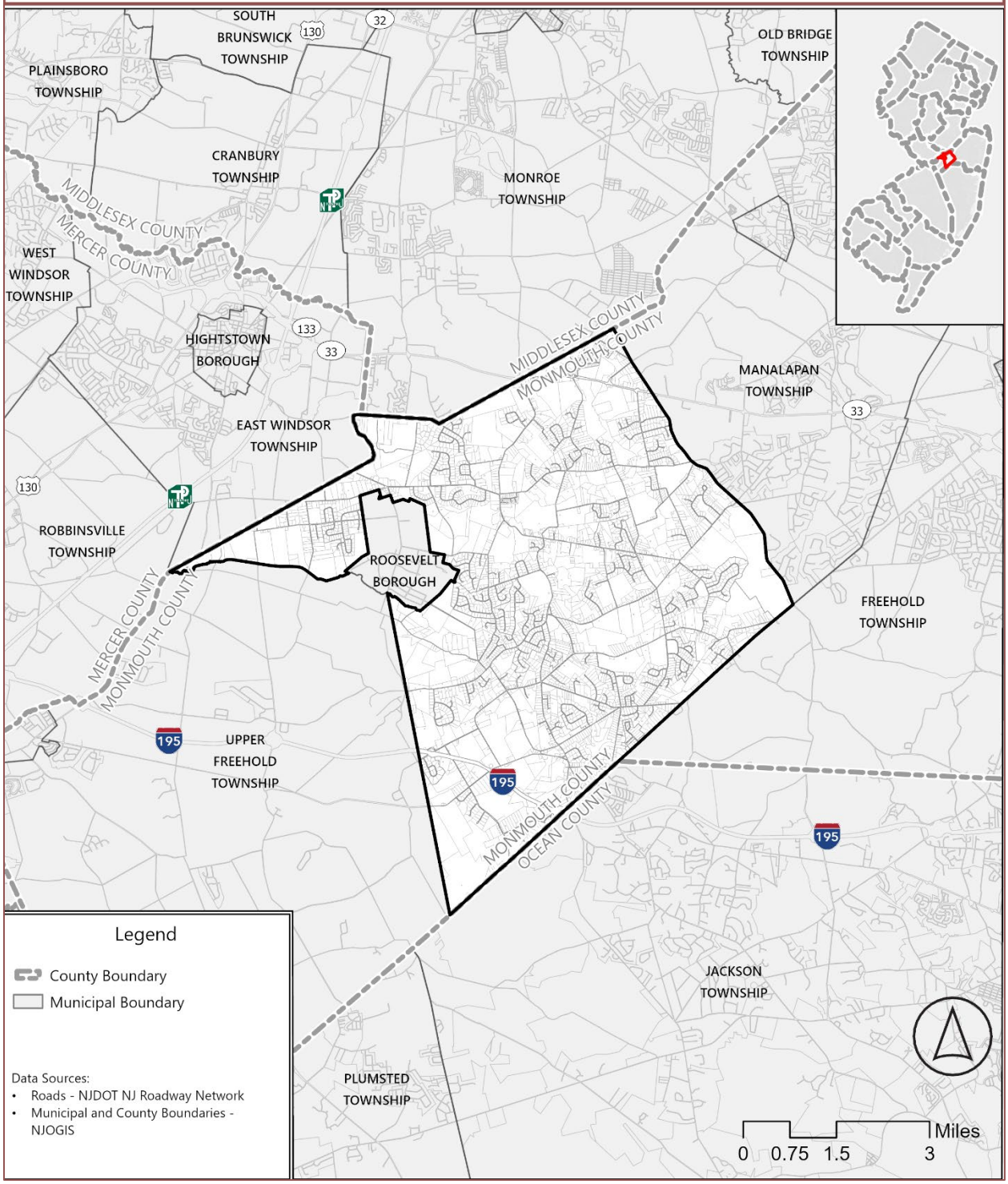
500 residents since the adoption of the 2006 NRI/ERI. The Township is the second least densely populated municipality in Monmouth County and in the least dense quintile of municipalities in New Jersey.

State Route 33, an east-west road stretching generally between the New Jersey Turnpike on the west and Neptune Township near the Atlantic Coast on the east runs through the northern portion of the Township. The Route 33 corridor has seen the most significant non-residential development and development pressure over the past ten to fifteen years. Several warehouses and other commercial developments have been completed in the Township while some substantial residential developments have been undertaken along the corridor in neighboring municipalities.

Interstate 195 runs through the southern portion of the Township also connecting the New Jersey Turnpike and Garden State Parkway and generally running between I-295 near Trenton on the west side of the state and the Garden State Parkway near Belmar on the east side of the state. The I-195 and Monmouth Road interchange is on the municipal border with Jackson Township near Six Flags Great Adventure and the Jackson Premium Outlets.

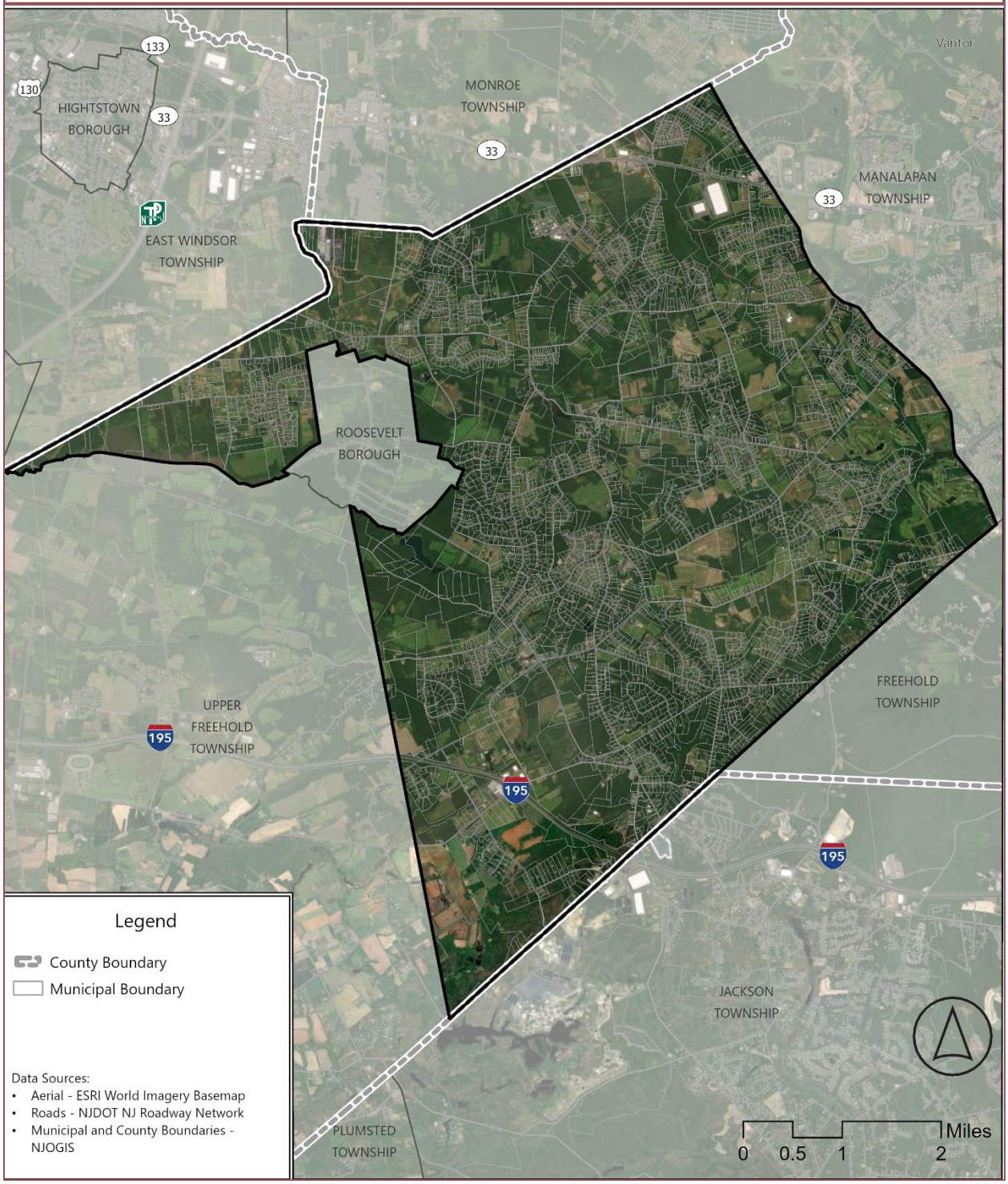
Map 1 - Regional Location
Millstone Township, NJ

November 2026



Map 2 - Aerial Image
Millstone Township, NJ

November 2026



HISTORY

Millstone Township was formed from land occupied by the Lenni Lenape prior to contact with Europeans. The river, known to the Lenape as the Mattawong, was renamed the Millstone River by Europeans and gave its name to the Township. The Township was formed as an administrative governmental entity by an act of legislation on February 28, 1844. The Township brought together rural land and a number of villages including Carrs Tavern, Holmeson, Smithburg, Sweetman, Bergen Mills, Bairdsville, Stone Tavern, Clarksburg, and Perrineville, some of which continue to lend their names to roads and neighborhoods within the Township today. The Township was part of the American Revolutionary War history that is prevalent throughout Monmouth County. Signal Beacon #21 was a post for the Continental Army and the Rising Sun Tavern was an outpost used by General George Washington during the war.

In more recent history, the Township has seen surges of growth and development alongside broader trends of suburbanization in New Jersey as rural farmland has faced residential and non-residential development pressures. The Township's population barely changed between 1860 and 1970 with fluctuations between 2,300 and 2,500 residents over the course of more than a century. The trend of residential development and suburbanization began in the 1970s and surged in the 1990s before finally slowing down in the 2010s. Between 1970 and 2010, the Township's population increased more than fourfold from 2,535 to 10,566. While there is still some residential development activity, particularly as part of the Township's ongoing efforts to comply with its state-mandated affordable housing obligations, most development pressure in the late 2010s and first half of the 2020s has taken the form of warehouse and other commercial developments along the Route 33 corridor and near Interstate 195.

The Township remains largely rural and has substantial areas of significant natural features that are either preserved or not suitable for development for practical and regulatory reasons. However, New Jersey continues to grow and there continues to be upward pressure on housing prices and demand for commercial and industrial space along highways and near major interstates so continued focus on preservation efforts is a critical component of the Township's Master Plan.

LAND USE AND LAND COVER

An important component of the ERI is distinguishing between land that has been impacted by development and human intervention and land that remains in a natural state. The NJDEP provides data sets that categorize land use and land cover statewide. Land Use data is generally used to describe the type and scale of human impacts on the environment. Urban and developed lands are those that have buildings, roads, parking lots, and other types of development that have replaced the natural environment. Agricultural land is actively farmed or formerly farmed lands. Barren lands are those that have been stripped of natural vegetation through excavation and grading, which may be land under construction and quarries, but could also include beaches and open sandy areas. Land Cover describes different types of natural environments including forests, wetlands, and water.

The data is developed using aerial imaging that is analyzed and categorized based on the distinct signature present in the imagery for different types of land use and land cover.[1]

LAND USE AND LAND COVER

The NJDEP Land Use and Land Cover (LU/LC) classifications are based on a system developed primarily by and named for James R. Anderson for use with remote sensor data such as aerial imagery. The standardized divisions developed by Anderson and team have been in use by NJDEP since they began publishing LU/LC data in the 1980s. The current data set is from 2020 with a planned update based on 2025 aerial imagery in the near future. There are six main categories at the highest level, which are then sub-classified into more finely grained categories.

TABLE 1 – LAND USE / LAND COVER TYPES

Type	2002 Acreage	2020 Acreage	Change (%)
URBAN	5,865.78	7,088.90	20.85%
AGRICULTURE	5,624.84	4,793.22	-14.78%
BARREN LAND	357.53	196.48	-45.05%
FOREST	6,419.81	6,344.46	-1.17%
WETLANDS	5,189.97	4,990.03	-3.85%
WATER	342.28	387.14	13.10%

Urban

Urban land is characterized by the presence of buildings, structures, and manmade impervious surfaces. Strip developments including highways, power and communications corridors, and other installations are classified as urban land. In Millstone, just under thirty percent of the land is classified as urban. The urban areas consist of mostly rural, single-unit residential uses with some notable commercial, industrial, and recreational lands. The amount of urban land in the Township has increased by about twenty percent in the nearly two decades between 2002 and 2020. The LU/LC patterns show the road network generally being absorbed into the developed properties that front major rights-of-way; however, the JCP&L transmission corridor that runs through the Township diagonally from west to east and generally north to south on the eastern edge of the

[1] https://dep.nj.gov/dsr/environmental-trends/lulc/

Township is clearly visible in the urban land designation through portions of the Township that are otherwise more rural or undeveloped.

Agriculture

Agricultural land is defined as land used primarily for production of food and fiber. Approximately twenty percent of the land in Millstone is classified as agricultural. Between 2002 and 2020, the amount of agricultural land has decreased by about 15 percent, which has largely corresponded to the increase in urban land. The patterns are seen through the development of several residential subdivisions and some of the commercial and industrial development along the Route 33 corridor and elsewhere. It should be noted that the loss of agricultural land has slowed from the rate previously observed in the 1980s and 90s when many of the Township's residential subdivisions were being constructed.

Barren Land

Barren land is sandy, rocky, or disturbed areas with limited or no vegetation that is not otherwise developed. Barren lands can appear in the LU/LC data when sites are being excavated and graded as part of an ongoing development. The amount of barren land in the Township declined substantially between 2002 and 2020, which may account for a snapshot of ongoing developments when the 2002 data was collected. Other barren land in the Township includes several quarrying / mining operations including the Stavola Asphalt plant on Old Bergen Mills Road, and Buck Mining and Materials on Pine Hill Road.

Forest

Land classified as forest has a tree cover of at least ten percent. Land that has been cleared to below that threshold but has not been otherwise developed can also be classified as forest land. There are numerous sub-categories based on the type and density of trees present in the area. The most common category in Millstone is deciduous forest with greater than fifty percent crown closure. Between 2002 and 2020, there was a minimal decline in forested area of just over one percent.

Wetlands

Wetlands are areas that are wet for at least a portion of the year and are characterized by aquatic or hydrophytic vegetation. Wetlands can include marshes, swamps, bogs, and are generally low points in the topography of an area. Millstone has seen a slight decrease of nearly four percent in the area of its wetlands between 2002 and 2020. Wetlands still comprise nearly twenty-one percent of the Township's area and are the third most prevalent category in the 2020 LU/LC data.

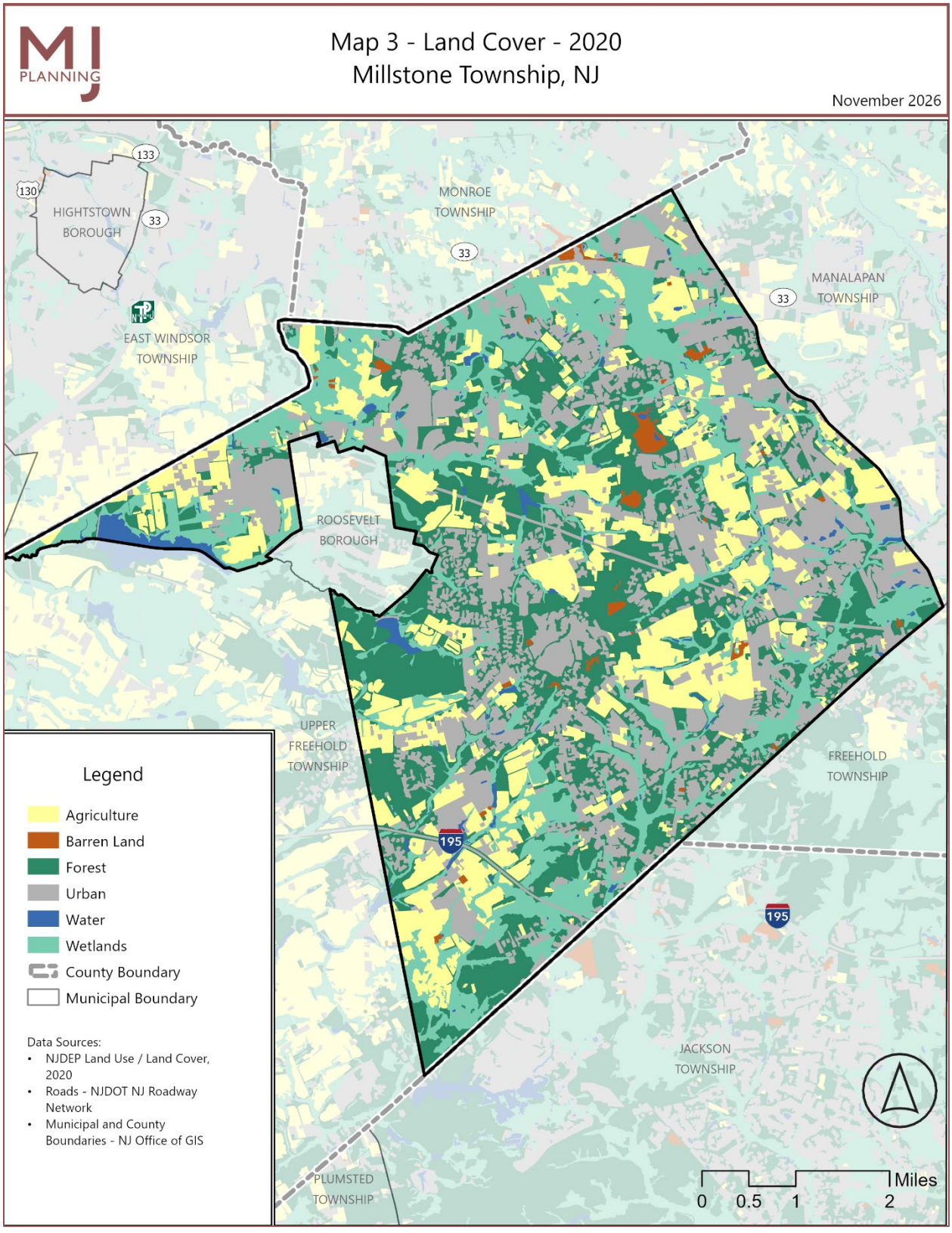
Water

Water includes streams, canals, lakes (including artificial lakes), reservoirs, bays, and estuaries. In Millstone, most of the water area is classified as artificial lakes. Artificial lakes / reservoirs created through damming include Assunpink Lake, Rising Sun Lake, and Perrineville Lake. About 1.6 percent of Millstone's area is classified as water.

Table 2 – Land Use / Land Cover Categories

CATEGORY	ACRES	PERCENTAGE
AGRICULTURE	**4793.22**	**20.14%**
CROPLAND AND PASTURELAND	2872.12	12.07%
ORCHARDS/VINEYARDS/NURSERIES/HORTICULTURAL AREAS	1023.38	4.30%
OTHER AGRICULTURE	897.71	3.77%
BARREN LAND	**196.48**	**0.83%**
EXTRACTIVE MINING	96.56	0.41%
TRANSITIONAL AREAS	99.92	0.42%
FOREST	**6344.46**	**26.66%**
CONIFEROUS BRUSH/SHRUBLAND	23.56	0.10%
CONIFEROUS FOREST (>50% CROWN CLOSURE)	116.27	0.49%
CONIFEROUS FOREST (10-50% CROWN CLOSURE)	9.30	0.04%
DECIDUOUS BRUSH/SHRUBLAND	188.60	0.79%
DECIDUOUS FOREST (>50% CROWN CLOSURE)	4603.94	19.34%
DECIDUOUS FOREST (10-50% CROWN CLOSURE)	250.42	1.05%
MIXED DECIDUOUS/CONIFEROUS BRUSH/SHRUBLAND	493.95	2.08%
MIXED FOREST (>50% CONIFEROUS WITH >50% CROWN CLOSURE)	120.48	0.51%
MIXED FOREST (>50% CONIFEROUS WITH 10-50% CROWN CLOSURE)	21.63	0.09%
MIXED FOREST (>50% DECIDUOUS WITH >50% CROWN CLOSURE)	322.42	1.35%
MIXED FOREST (>50% DECIDUOUS WITH 10-50% CROWN CLOSURE)	27.44	0.12%
OLD FIELD (< 25% BRUSH COVERED)	156.79	0.66%
PLANTATION	9.65	0.04%
URBAN	**7088.90**	**29.79%**
ATHLETIC FIELDS (SCHOOLS)	28.62	0.12%
CEMETERY	19.16	0.08%
COMMERCIAL/SERVICES	200.84	0.84%
INDUSTRIAL	62.78	0.26%
INDUSTRIAL AND COMMERCIAL COMPLEXES	1.95	0.01%
MAJOR ROADWAY	59.60	0.25%
OTHER URBAN OR BUILT-UP LAND	281.32	1.18%
RECREATIONAL LAND	628.15	2.64%
RESIDENTIAL, HIGH DENSITY OR MULTIPLE DWELLING	1.97	0.01%
RESIDENTIAL, RURAL, SINGLE UNIT	5059.62	21.26%
RESIDENTIAL, SINGLE UNIT, LOW DENSITY	385.73	1.62%
RESIDENTIAL, SINGLE UNIT, MEDIUM DENSITY	5.89	0.02%
STORMWATER BASIN	111.09	0.47%
TRANSPORTATION/COMMUNICATION/UTILITIES	97.75	0.41%
UPLAND RIGHTS-OF-WAY DEVELOPED	4.97	0.02%
UPLAND RIGHTS-OF-WAY UNDEVELOPED	139.47	0.59%

WATER	**387.14**	**1.63%**
ARTIFICIAL LAKES	251.90	1.06%
BRIDGE OVER WATER	0.01	0.00%
NATURAL LAKES	134.39	0.56%
STREAMS AND CANALS	0.84	0.00%
WETLANDS	**4990.03**	**20.97%**
AGRICULTURAL WETLANDS (MODIFIED)	665.61	2.80%
CEMETERY ON WETLAND	2.43	0.01%
CONIFEROUS WOODED WETLANDS	11.37	0.05%
DECIDUOUS SCRUB/SHRUB WETLANDS	308.61	1.30%
DECIDUOUS WOODED WETLANDS	3428.49	14.41%
DISTURBED WETLANDS (MODIFIED)	72.99	0.31%
FORMER AGRICULTURAL WETLAND (BECOMING SHRUBBY, NOT BUILT-UP)	21.20	0.09%
HERBACEOUS WETLANDS	134.53	0.57%
MANAGED WETLAND IN BUILT-UP MAINTAINED REC AREA	14.85	0.06%
MANAGED WETLAND IN MAINTAINED LAWN GREENSPACE	22.49	0.09%
MIXED SCRUB/SHRUB WETLANDS (CONIFEROUS DOM.)	20.73	0.09%
MIXED SCRUB/SHRUB WETLANDS (DECIDUOUS DOM.)	131.05	0.55%
MIXED WOODED WETLANDS (CONIFEROUS DOM.)	26.74	0.11%
MIXED WOODED WETLANDS (DECIDUOUS DOM.)	84.06	0.35%
PHRAGMITES DOMINATE INTERIOR WETLANDS	10.18	0.04%
WETLAND RIGHTS-OF-WAY	34.68	0.15%


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Map 3 - Land Cover - 2020
Millstone Township, NJ
November 2026
HIGHTSTOWN BOROUGH
EAST WINDSOR TOWNSHIP
MONROE TOWNSHIP
MANALAPAN TOWNSHIP
ROOSEVELT BOROUGH
UPPER FREEHOLD TOWNSHIP
FREEHOLD TOWNSHIP
JACKSON TOWNSHIP
PLUMSTED TOWNSHIP
133
130
33
195
Legend
Agriculture
Barren Land
Forest
Urban
Water
Wetlands
County Boundary
Municipal Boundary
Data Sources:
• NJDEP Land Use / Land Cover, 2020
• Roads - NJDOT NJ Roadway Network
• Municipal and County Boundaries - NJ Office of GIS
0 0.5 1 2 Miles

TOPOGRAPHY AND SOILS

REGIONAL PHYSIOGRAPHY

Physiography, which is also referred to as physical geography, provides an overview of landforms based on characteristics associated with topography, geology, hydrology, and edaphology.[2] The State is divided into defined physiographic provinces based on those characteristics. Millstone Township and its immediate surroundings are located in the Coastal Plain province. A fall line is observed where the Coastal Plain meets the Piedmont province, to the northwest of the Township, which provides a stark line of demarcation between areas with different physiographic characteristics.

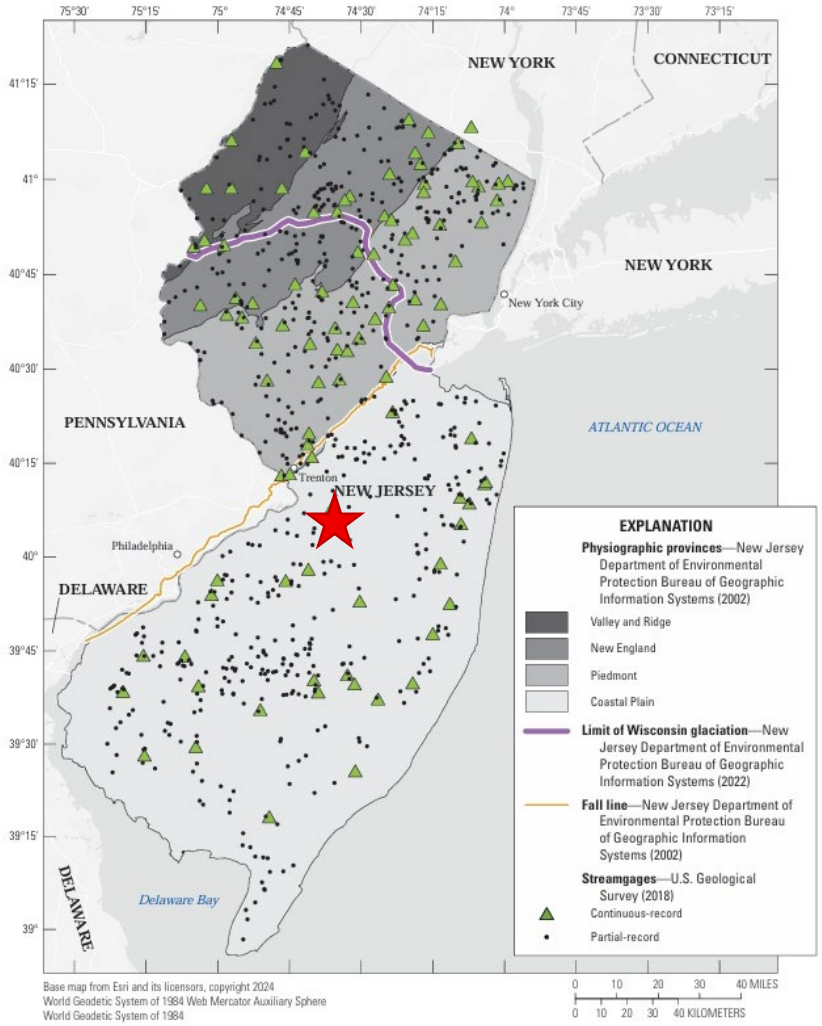


Figure 1 - Physiographic Provinces of NJ (General Location of Millstone identified with a red star)
[Source: https://www.usgs.gov/media/images/physiographic-provinces-new-jersey]

[2] Topography – The study of forms and features of land surfaces including slopes, mountains, valleys, etc.
Geology – The study of the composition of the structure of the Earth and the processes by which it changes over time.
Hydrology – The study of the movement, distribution, properties, and management of water on Earth.
Edaphology – One of the divisions of soil science concerning the influence of soils on living beings, particularly plants.

TOPOGRAPHY AND STEEP SLOPES

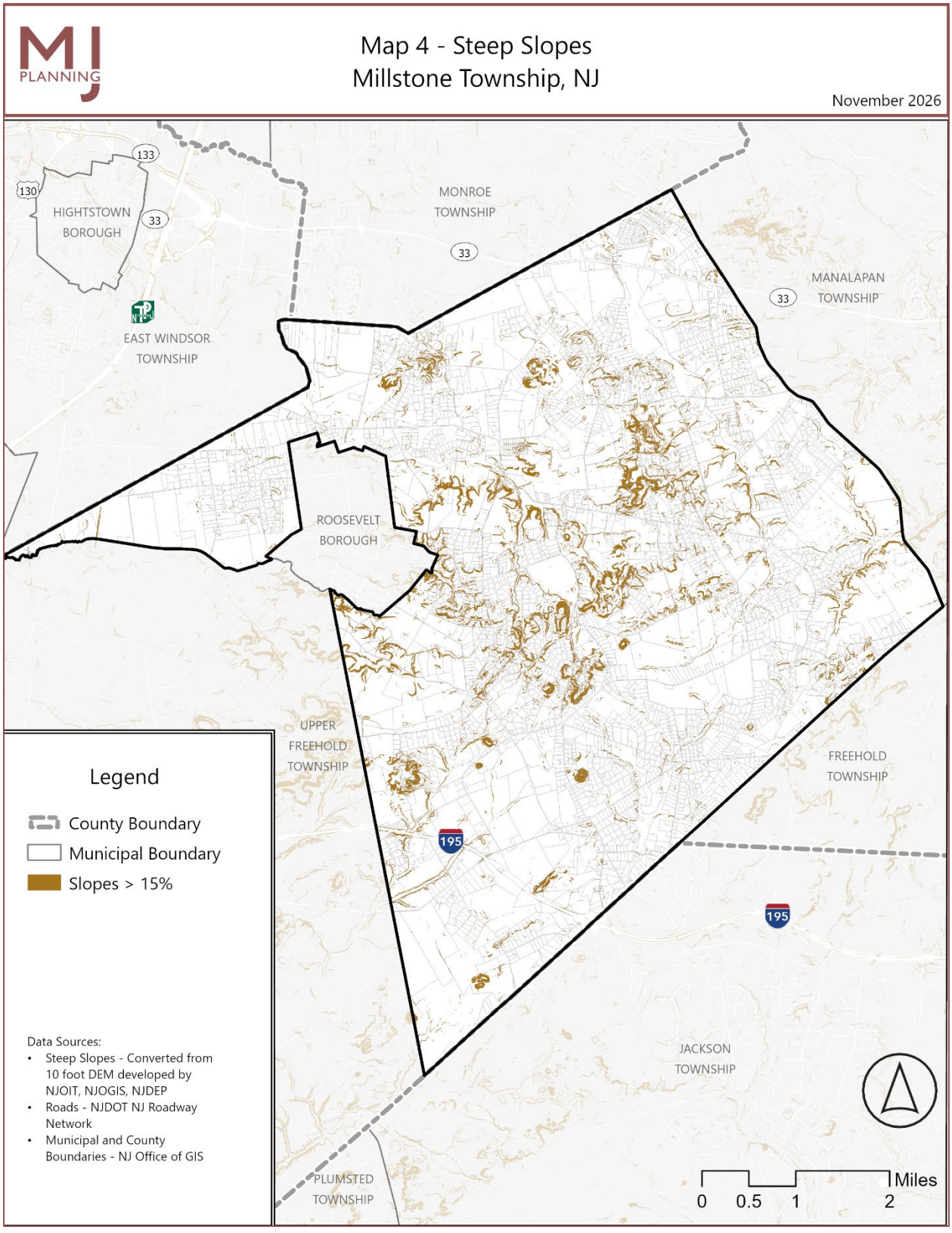
Millstone Township has more notable sloped areas and topographic variation relative to some of the neighboring municipalities in the area. The highest elevation in the Township is Pine Hill, which is situated in the east central portion of Millstone, west of Stillhouse Road, at about 372 feet above sea level. The lowest points in Millstone are along the streams at the perimeter of the Township, with the lowest area at an elevation of about 98 feet in the Assunpink Creek. The remainder of the Township has rolling hills with an overall fairly level landscape.

The steepest slopes in Millstone are generally near Pine Hill Road, surrounding Perrineville Lake, and near the intersection of Sweetman's Lane and Backbone Hill Road, near Roosevelt Borough and Upper Freehold Township.

Slopes in excess of 15 percent (elevation change / distance) are generally considered “steep slopes.” The Township has several sections in its code that define and regulate steep slopes for purposes of limiting disturbance and restricting development within these environmentally sensitive areas. Most agricultural activity requires slopes of 5 percent or less to accommodate heavy equipment. Activity associated with pastureland, nurseries, and hand-cultivated field crops can take place on more steeply sloped land.

The purpose of protecting steeply sloped areas is to maintain existing vegetation and soil stability, reduce erosion, and limit stormwater runoff. Disturbance to steep slopes, particularly naturally occurring vegetated slopes can lead to flooding, sedimentation of waterways that impacts water quality, habitat destruction, and property damage.

Approximately 1,784 acres of land area in the Township has slopes that exceed 15 percent. This accounts for about 7.3 percent of the area of the Township.


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Map 4 - Steep Slopes
Millstone Township, NJ
November 2026
HIGHTSTOWN BOROUGH
EAST WINDSOR TOWNSHIP
MONROE TOWNSHIP
MANALAPAN TOWNSHIP
ROOSEVELT BOROUGH
UPPER FREEHOLD TOWNSHIP
FREEHOLD TOWNSHIP
JACKSON TOWNSHIP
PLUMSTED TOWNSHIP
133
130
33
195
Legend
County Boundary
Municipal Boundary
Slopes > 15%
Data Sources:
• Steep Slopes - Converted from 10 foot DEM developed by NJOIT, NJOGIS, NJDEP
• Roads - NJDOT NJ Roadway Network
• Municipal and County Boundaries - NJ Office of GIS
0 0.5 1 2 Miles

SOILS

Soils are mixtures of minerals (clay, silt, sand, gravel, stones), water, air, and organic matter (both living and dead organisms). The composition of soil varies from one location to another. The largest component of soil is minerals that come from weathered or broken parent material.

Soil characteristics in an area reflect and have a significant impact on ecology, hydrology, agriculture, and land use. The nature of soils impacts their suitability for agricultural purposes, with prime farmland and other soils of natural importance being a delicate, non-renewable resource. Soil types impact the flora and fauna found in different areas. Soil composition, depth to bedrock, and depth to the seasonal high water table influence suitability for development and can impact the type and style of construction that may take place in urbanized areas.

Soils are classified by the Natural Resource Conservation Service (NRCS), which is an agency of the United States Department of Agriculture (USDA). Soil series are defined based on localized geographic characteristics and are broken down into sub-classifications defined by soil textures, slopes, flood frequencies, and other factors.

Table 2 provides a breakdown of the soil series and sub-classifications found in Millstone. Map 5 shows the distribution of soils throughout the Township.

Soil Series Descriptions[3]

ADELPHIA

The Adelphia series consists of very deep, moderately well drained soils that may be classified as hydric. These soils formed in glauconite bearing eolian and/or fluvio-marine deposits. They are located on low summits, backslopes, and footslopes with slopes of 0 to 10 percent. The seasonal high water table is 18 to 42 inches deep and the depth to bedrock exceeds 72 inches. Major uses include agriculture, historically corn, soybeans, small grains, hay, pasture, turf grasses, and vegetables with many areas now characterized by urban land. These soils range from somewhat to very limited depending on the type of development.

ATSION

The Atsion series consists of very deep, poorly drained soils formed from sandy marine sediments that may be classified as hydric. These soils are located in flats and depressions with slopes between 0 and 2 percent. The depth to the seasonal high water table is 6 to 12 inches and the depth to bedrock is greater than 60 inches. The soils are found mostly in wooded areas but are sometimes used for cultivation of blueberries and cranberries. The Atsion series tends to be very limited for development due to the shallow depth to the saturated zone.

COLEMANTOWN

The Colemantown series consists of very deep, poorly drained soils formed from glauconite bearing fluvio-marine deposits that may meet multiple criteria for hydric soils. These soils are typically located in flats,

Definitions

Fluvio-marine – deposits formed by the joint action of a river and the sea.

Glauconite – an iron potassium phyllosilicate mineral that forms in marine settings and is commonly associated with low-oxygen conditions.

Eolian – soils or landforms produced by the erosive or depositive action of wind. These tend to be sandy soils.

[3] https://soilseries.sc.egov.usda.gov/

depressions, and drainageways with slopes of 0 to 2 percent. The depth to the seasonal high water table varies between 0 and 12 inches and the depth to bedrock exceeds 72 inches. Typically areas have been cleared for agriculture, particularly hay, pasture, turf, corn, and soybeans. Wooded areas are dominated by sweetgum, red maple, white oak, American holly, and yellow poplar. The Colemantown series is very limited for development due to ponding, flooding, and the shallow depth to the saturated zone.

COLLINGTON

The Collington series is very deep, well drained soils formed from glauconite bearing eolian and/or fluvio-marine deposits. These souls are typically located in broad interfluve, hill, and ridge areas with slopes ranging from 0 to 80 percent. The depth to the seasonal high water table and bedrock both exceed 72 inches. These areas have historically been cleared and used for corn, wheat, soybeans, hay, pasture, fruits, vegetables, and nursery. However, in New Jersey, many areas have since become urbanized as the soils tend not to have any limitations on development.

COLTS NECK

The Colts Neck series contains very deep, well drained soils formed from loamy marine sediments containing glauconite. The soils are found in upland summits and side slopes with a range of slopes between 0 and 40 percent. The depth to both bedrock and the seasonal high water table exceeds 60 inches. Nearly all Colts Neck soils have been cleared and used for corn, small grains, hay, tree fruits, truck crops, and ornamental nurseries. The Colts Neck series does not generally have any limitations on development.

DOWNER

Downer soil is the New Jersey State Soil. It is a very deep, well drained soil developed from acid loamy fluvio-marine deposits. The soils are generally found in hills, ridges, and areas of higher ground between rivers with slopes ranging from 0 to 30 percent. The depth to bedrock and the seasonal high water table exceeds 72 inches. Most areas are used for growing field crops, vegetables, flowers, and some tree fruits. There are no limitations on development for the Downer series.

ELKTON

The Elkton soil series consists of very deep, poorly drained soils formed from silty eolian material over loamy alluvial or marine settlements that may be classified as hydric. The Elkton series is generally found in flat areas with slopes between 0 and 2 percent in low-lying uplands, lowlands, and ancient floodplains. The seasonal high water table is between 0 and 12 inches with the depth to bedrock exceeding 60 inches. Elkton soils are mostly woodland. Adequately drained areas are used to grow corn, soybeans, and small grain crops. Some areas are grazed, but there is little improved pasture. The Elkton series soils tend to be very limited for development due to ponding, flooding, shallow depth to the saturated zone, and potential for shrink-swell.

EVESBORO

The Evesboro soil series consists of very deep, excessively drained soils formed from sandy marine and eolian deposits. The soils are found in coastal plain uplands, generally with slopes between 0 and 5 percent, but the slopes can be as great as 40 percent. Evesboro soils are the fourth most common series in Millstone encompassing just under 8 percent of the Township. The depth to the seasonal high water table and bedrock exceeds 72 inches. Most areas are in woodland, fruit and vegetable crops, or urban land. The area in woodland has generally been repeatedly cut for wood products. There are generally no limitations on development in Evesboro soils.

FALLINGSTON

The Fallingston soil series is made up of very deep, poorly drained soils from loamy fluvio-marine sediments that may meet multiple criteria to be classified as hydric. These soils are generally found in flats, swales, drainageways, and depressions with minimal slopes between 0 and 5 percent. The depth to the seasonal high water table is between 0 and 12 inches. The depth to bedrock exceeds 72 inches. Adequately drained areas are used for growing general crops and truck crops including corn, soybeans, and small grains. Some areas are in pasture. Other areas are in woodland with oaks, maples, gums, holly, green briar, and pond pine. Loblolly pine occupies some formerly cultivated areas. Fallingston soils are very limited for development due to ponding and the shallow depth to the saturated zone.

FLUVAQUENTS

Fluvaquents is a general term for soils that periodically receive fresh sediments such as flood plains, low stream terraces, alluvial fans, and depressions. These soils make up approximately an acre of area in Millstone, so are virtually non-existent. They are very limited for development due to ponding, flooding, and shallow depth to the saturated zone.

FREEHOLD

The Freehold series are very deep, well drained, moderately permeable soils formed in marine sediments containing glauconite. The Freehold series is the most common in Millstone comprising approximately 21.5 percent of the Township's area. These soils are on uplands in the coastal plains and have slopes ranging from 0 to 40 percent. Mean annual precipitation is 46 inches and mean annual temperature is 52 degrees F. Except for steep areas, these soils are generally cleared and used for growing vegetables, fruits and specialty crops. Woodland species include black, white, scarlet and northern red oaks, yellow-poplar, hickory and beech. Freehold soils are not limited for development.

HAMMONTON

The Hammonton series is very deep, moderately well drained, potentially hydric soils derived from loamy fluvio-marine sediments. They are generally located in flats, depressions, and drainageways with slopes ranging from 0 to 15 percent. The depth to the seasonal high water table is 18 to 42 inches and the depth to bedrock is greater than 72 inches. Cleared areas are used for production of fruit, vegetables, row crops, and nursery stock. Native vegetation is a mixed hardwood forest containing scattered pitch pine, shortleaf pine, loblolly pine and Virginia pine. Development is somewhat or very limited depending on construction type due to the shallow depth to the saturated zone.

HATBORO

The Hatboro series consists of very deep and poorly drained soils formed in alluvium derived from metamorphic and crystalline rock. They are on flood plains. Slopes range from 0 to 3 percent. The depth to bedrock is greater than 60 inches and can exceed ten feet. Saturated hydraulic conductivity is moderately high to high. Mean annual precipitation is 42 inches. The soils are in pasture, woodland areas with mixed hardwoods, and cropland.

HOLMDEL

The Holmdel series is very deep soils that vary in their drainage properties from somewhat poorly drained to moderately well drained and may be classified as hydric. Holmdel soils are formed from loamy glauconite bearing marine and/or fluvio-marine sediments. They are found in flats, depressions, drainageways, and swales with shallow slopes between 0 and 5 percent. The depth to the seasonal high water table is 12 to 42 inches and the depth to bedrock exceeds 72 inches. The soils have been historically cleared and used for corn,

wheat, soybeans, hay, pasture, fruits, vegetables, and nursery. The natural vegetation consists of mixed upland oaks, sweetgum, yellow-poplar, hickory, red maple, sassafras, and American beech. Development potential may be somewhat or very limited due to the shallow depth to the water table.

HUMAQUEPTS

Humaquepts are deep, poorly drained soils that are frequently flooded and classified as hydric. These are mucky, sandy soils generally found on flood plains and lowlands. They may be wooded and are generally not suitable for development due to ponding, flooding, and shallow depth to the water table.

KEYPORT

Keyport soils are very deep, moderately well drained and potentially classified as hydric. They are formed from moderately fine textured fluvio-marine sediments and found in broad interstream divides and slight depressions with slopes ranging from 0 to 25 percent. The depth to the seasonal high water table ranges from 18 to 42 inches and the depth to bedrock exceeds 72 inches. Most areas have been cleared for farming or general crops, hay and pasture. Where wooded areas remain, oaks, beech, hickory, maples, sweetgum, and pines are the typical species. Development potential ranges from somewhat to very limited depending on construction type due to the shallow depth to the saturated zone and the potential for shrink-swell.

KLEJ

The Klej soil series is very deep, somewhat poorly drained soils derived from sandy fluvio-marine sediments that may be classified as hydric. They are found in broad upland depressions and flats with slopes between 0 and 5 percent. The depth to the seasonal high water table is shallow at 10 to 24 inches while the depth to bedrock exceeds 72 inches. Some areas are irrigated. Cultivated areas are used for corn, soybeans, hay, and truck crops. Native vegetation is mixed oaks, sweetgum, red maple, pond pine and loblolly pine. Development potential ranges from somewhat to very limited due to the shallow depth to the water table.

LAKEHURST

The Lakehurst soil series is very deep, moderately well drained soils formed from sand coastal plain sediments that may be hydric. They are found in broad flats bordering streams and depressions with slopes between 0 and 5 percent. The depth to the seasonal high water table ranges from 18 to 42 inches and the depth to bedrock is greater than 60 inches. These soils are mostly woodland with some formerly farmed areas mostly abandoned. Wooded areas are dominantly pitch pine, shortleaf pine, black, and white oak, with an understory of lowbush blueberries and scrub oak. Where wildfires have been severe, pitch pine and black jack oak are dominant. Development is very limited where basements are proposed due to the depth to the saturated zone and is not limited otherwise.

LAKEWOOD

The Lakewood series consists of very deep, excessively drained, rapidly permeable soils on marine terraces that may be hydric. They are formed in sandy marine sediments. Slopes range from 0 to 25 percent. Depth to bedrock is greater than 60 inches and depth to the seasonal high water table is greater than 60 inches. Mean annual precipitation is 44 inches. Lakewood soils are mostly in woodland consisting of pitch pine, black oak, and white oak. Where wildfires have been severe the trees are dwarfed, growing less than 5 feet tall and consist primarily of pitch pine, scrub oak, and blackjack oak. Lakewood soils are not limited for development purposes.

MANAWAHKIN

Manahawkin soils are very deep, very poorly drained mucky soils consisting of organic deposits underlain by sandy fluvio-marine sediments. They are flat areas with slops between 0 and 2 percent found in lake basins,

back swamps, floodplains, and freshwater channels adjacent to tidewaters. The seasonal high water is generally at or above the surface. The depth to bedrock is greater than 60 inches. Manahawkin soils are generally wetland wildlife habitat and woodland that is very limited in its development potential due to flooding, subsidence potential, and shall depth to the water table.

MARLTON

The Marlton soil series is very deep, moderately well drained soils formed from clayey glauconite marine and/or fluvio-marine deposits. They are generally found on in low hills, flats, and depressions with slopes ranging from 0 to 40 percent. The seasonal high water table is 18-42 inches deep and the depth to bedrock exceeds 72 inches. Marlton soils have historically been cleared and used for corn, tomatoes, soybeans, hay and pasture, while more recently most areas have rapidly become urbanized. Development limitations range from somewhat to very limited due to shrink-swell potential and the shallow depth to the saturated zone.

MATAPEAKE

The Matapeake soil series consists of very deep, well drained soils formed from silty eolian sediments underlain by coarser fluvial or marine sediments. These soils are found in upland areas stretching between river valleys and side slopes with slopes ranging from 0 to 30 percent. They are barely present in Millstone with less than an acre identified as part of this series. The depth to the seasonal high water table and bedrock are 72 inches or greater. Almost all areas of Matapeake soils are cultivated with corn, soybeans, and small grains being commonly grown. A small amount of acreage is irrigated. These soils do not tend to have development limitations.

MATTAPEX

Mattapex soils are very deep, moderately well drained, potentially hydric soils formed from silty eolian deposits over fluvio-marine sediments. They are generally found in flats but slopes can range between 0 and 30 percent. The depth to the seasonal high water table is 18 to 40 inches while the depth to bedrock exceeds 72 inches. Mattapex soils are generally wooded areas typically populated by oaks, pines, maples, poplars, and sweet gums, or have been cleared for cultivation of corn, barley, wheat, and soybeans. There are no limitations on development except when basements are proposed, which may be very limited due to the shallow depth to the saturated zone.

PEMBERTON

The Pemberton soil series is very deep, moderately well drained soils formed from sandy eolian deposits underlain by loamy alluvium that may be classified as hydric. They are found in swales, depressions and low areas on broad ridges with slopes ranging from 0 to 5 percent. The seasonal high water table is 12 to 48 inches deep and the depth to bedrock exceeds 60 inches. The major use is agricultural production with drainage and irrigation. Pemberton soils do not have limitations on development except when basements are proposed, which may be very limited due to the shallow depth to the saturated zone.

PHALANX

Phalanx soils are well drained moderately to very deep soils derived from sandy and loamy fluvio-marine deposits. These soils are generally found on hills and ridges with slopes ranging from 0 to 25 percent. The depths to the seasonal high water table and bedrock both exceed 72 inches. Phalanx soils are typically woodland with minor acreage used for irrigated agriculture. Historically, many areas were mined for building stone, iron ore, and some areas to obtain iron ore for cannonballs during the American revolutionary war. Development is generally not limited except for minor limitations in sloped areas.

SASSAFRAS

The Sassafras soil series, the second most common in Millstone comprising just under 14 percent of the Township, is very deep, are well drained soils formed from loamy fluvio-marine sediments that may be classified as hydric. These soils are found in fluvio-marine terraces and flats with slopes ranging between 0 and 45 percent. The depth to the seasonal high water table exceeds 72 inches and the depth to bedrock is greater than 80 inches. Sassafras soils are mainly used for agriculture, pastures, fruits, woodlands, and nonfarm purposes. Where they remain wooded, native vegetation is a mix of upland hardwoods with shortleaf and Virginia pine. There are no limitations on development in Sassafras soils.

SHREWSBURY

Shrewsbury soils are the fifth most common type in the Township covering about 7 percent of Millstone's land area. These are very deep, poorly drained soils formed from marine sediments containing moderate amounts of glauconite and may be classified as hydric. They are found in flats and depressions with slopes between 0 and 2 percent. The depth to the seasonal high water table is very shallow ranging form 0 to 12 inches, while the depth to bedrock is quite deep, exceeding 120 inches. Drained areas grow corn, soybeans, small grains, hay, pasture, and turf grasses. A few areas are used for blueberries and vegetables. Development in Shrewsbury soils is very limited due to the shallow depth to the saturated zone.

TINTON

Tinton soils are very deep, well drained soils formed from sandy eolian deposits over glauconite bearing fluvio-marine deposits. These are the third most common soil type in Millstone covering approximately 11 percent of the Township. They are found on low hills and ridges with slopes ranging from 0 to 25 percent. The depths to the seasonal high water table and bedrock both exceed 72 inches. Tinton soils are used for irrigated fruit and vegetable production. Where they have not been cleared for agriculture, they are wooded with a mix of oaks and scattered Virginia pine. There are no limitations to development in Tinton soils.

UDORTHENTS

Udorthents are nearly level and gently sloping soils that have been modified by excavation or filling. The depth and overall soil composition varies from place to place. These soils may also contain concrete, asphalt, metal, glass, and other similar historic fill left behind as a result of human intervention. On-site investigations are necessary to evaluate the specific soil make up and development potential of areas with Udorthents.

WOODSTOWN

The Woodstone series consists of very deep, moderately well drained soils formed from sandy marine and old alluvial sediments that may be classified as hydric. These soils are found in upland marine terraces and old stream terraces with slopes between 0 and 30 percent. The depth to the seasonal high water table is 18 to 42 inches and the depth to bedrock exceeds 60 inches. Most Woodstown soils are used for agricultural purposes including corn, soybeans, small grains, hay, and pasture. Development limitations range from somewhat to very severe due to the shallow depth to the saturated zone.

Hydric Soils

According to the NRCS, hydric soils are "formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation." Four criteria, with several sub-criteria are used to identify components of hydric soils.

1. All Histels except Flistels, all Hisosols except Folists, and all Wassents.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
    a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    b. Show evidence that the soil meets the definition of a hydric soil;
3. Soils that are frequently ponded for long or very long duration during the growing season.
    a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    b. Show evidence that the soil meets the definition of a hydric soil;
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
    a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    b. Show evidence that the soil meets the definition of a hydric soil;

Approximately 68.6 percent of the land area in Millstone encompassing over 16,000 acres potentially contains soil components that meet one or more of the criteria to be considered hydric.

Impact of Soils on Development

Soil properties impact development with rating factors established by the USDA / NRCS on a scale of 0.01 (no limitation) to 1.00 (greatest limitation or impact on potential use). The numerical rating system is broken down into three tranches consisting of soils that are “Not Limited”, “Somewhat Limited”, and “Very Limited”. The limitations can be caused by shallow depth to saturated soil (the seasonal water table), ponding, flooding, steep slopes, propensity for shrink-swell, potential for subsidence, and other factors.

The potential soil limitations are differentiated by categories of development. Those most relevant to potential new development in Millstone include dwellings (with and without basements), small commercial buildings, and septic disposal fields.

TABLE 3 - SOIL SERIES AND DEVELOPMENT IMPACTS IN MILLSTONE TOWNSHIP

Series	Area (Acres)	% of Township	Dwellings w/o basements	Dwellings w/ basements	Small Commercial Buildings	Septic Disposal Fields
Adelphia	558.5	2.35%	2	3	2	2
Atsion	383.8	1.61%	3	3	3	3
Colemantown	407.5	1.71%	3	3	3	3
Collington	1426.0	5.99%	1	1	2	1
Colts Neck	233.2	0.98%	1	1	1	1
Downer	59.6	0.25%	1	1	1	1
Elkton	237.8	1.00%	3	3	3	3
Evesboro	1897.2	7.97%	1	1	1	1
Fallingston	465.0	1.95%	3	3	3	3
Fluvaquents	1.0	0.00%	3	3	3	3
Freehold	5107.9	21.46%	1	1	1	1
Hammonton	30.2	0.13%	2	3	2	3
Hatboro-Codorus Complex	0.016	0.00%	3	3	3	3
Holmdel	977.2	4.11%	2	3	2	2
Humaquepts	934.8	3.93%	3	3	3	3
Keyport	203.7	0.86%	2	3	2	3
Klej	168.5	0.71%	2	3	2	3
Lakehurst	154.3	0.65%	1	3	1	2
Lakewood	571.6	2.40%	1	1	1	1
Mattapex	0.016	0.00%	1	3	1	2
Manawahkin	244.3	1.03%	3	3	3	3
Marlton	555.8	2.33%	2	3	2	2
Matapeake	0.007	0.00%	1	1	1	1
Pemberton	328.2	1.38%	1	3	1	2
Phalanx	76.0	0.32%	1	1	2	2
Pits,	230.1	0.97%	NR	NR	NR	NR
Sassafras	3308.5	13.90%	1	1	1	1
Shrewsbury	1650.1	6.93%	3	3	3	3
Tinton	2577.1	10.83%	1	1	1	1
Udorthents	113.4	0.48%	1	1	2	1
Woodstown	610.1	2.56%	2	3	2	3
Water	293.2	1.23%	NR	NR	NR	NR

1 - Not Limited – soil has features that are favorable for the proposed use, so good performance and low maintenance can be expected.

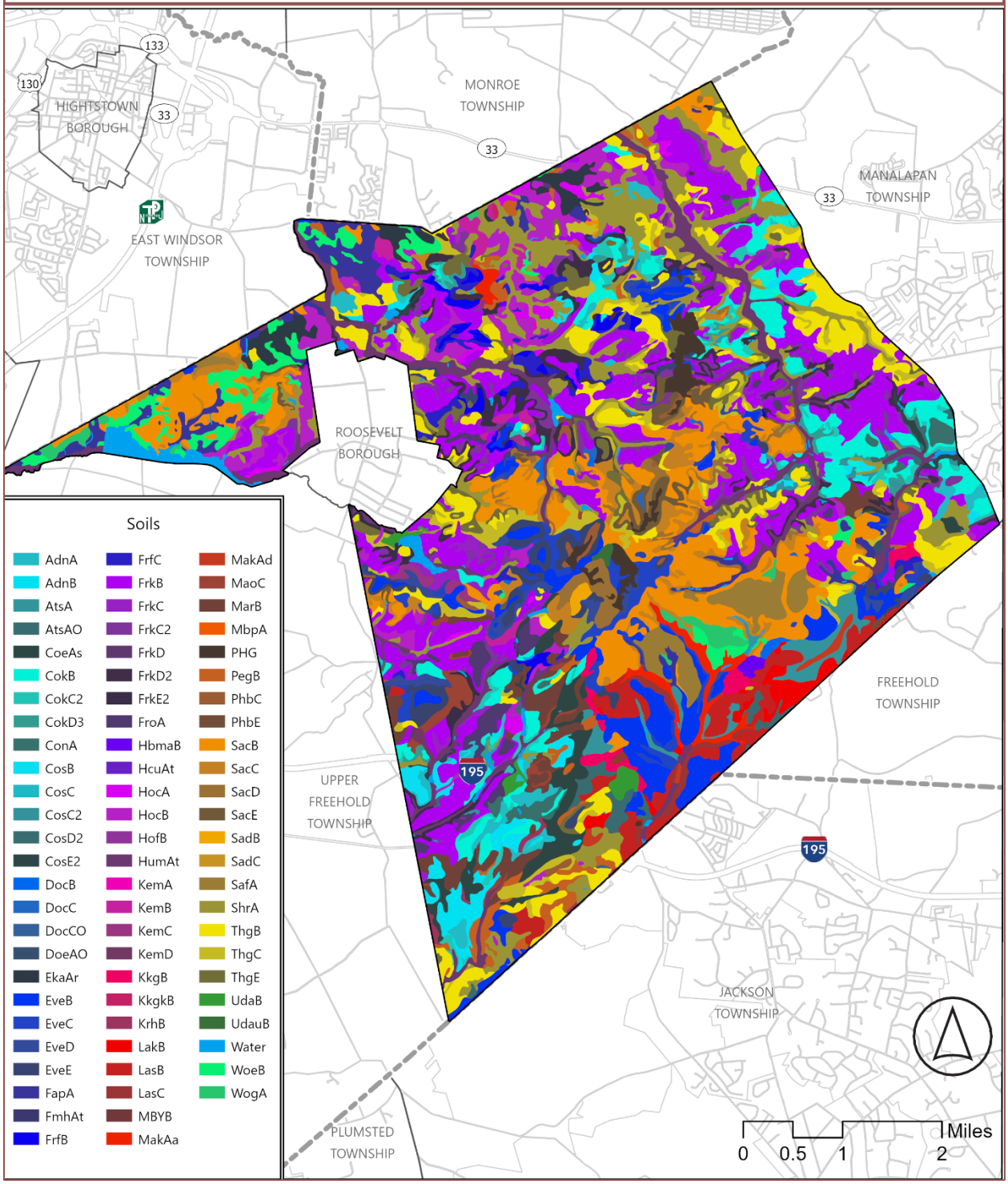
2 - Somewhat Limited – soil has features that are moderately favorable for the proposed use. There are limitations that can be overcome or minimized through planning, design, or installation. Fair performance and moderate maintenance can be expected.

3 - Very Limited – soil has one or more features that are unfavorable for the proposed use and are not easily overcome without soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance costs can be expected.

NR - Not Rated

Map 5 - Soils
Millstone Township, NJ

November 2026



Agriculturally Important Soils[4]

PRIME FARMLAND

Prime Farmland is defined by the USDA as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods, Prime Farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding." The New Jersey State Agricultural Development Committee (SADC) maintains the GIS mapping layers on which this analysis is based. Prime Farmland in the state includes USDA Land Capability Class 1 soils and select soils from Class 2.

Prime Farmlands have an adequate and dependable supply of moisture while not being overly erodible, saturated, or flooded; favorable growing seasons; acceptable pH levels of acidity or alkalinity; salt and sodium levels within acceptable ranges; few or no rocks; and slopes under 6 percent.

A large percentage of the land, particularly the undeveloped land, in the Township is defined as prime farmland.

SOILS OF STATEWIDE IMPORTANCE

Soils of Statewide Importance area defined by the USDA as "farmlands of statewide importance include those soils in land capability Class II and III that do not meet the criteria as Prime Farmland, these soils are nearly Prime Farmland and economically produce high yields of crops when treated and managed according to acceptable farming methods, Some may produce yields as high as Prime Farmland if conditions are favorable."

In Millstone, some areas are identified as farmland of statewide importance and other areas identified as farmland of statewide importance if drained.

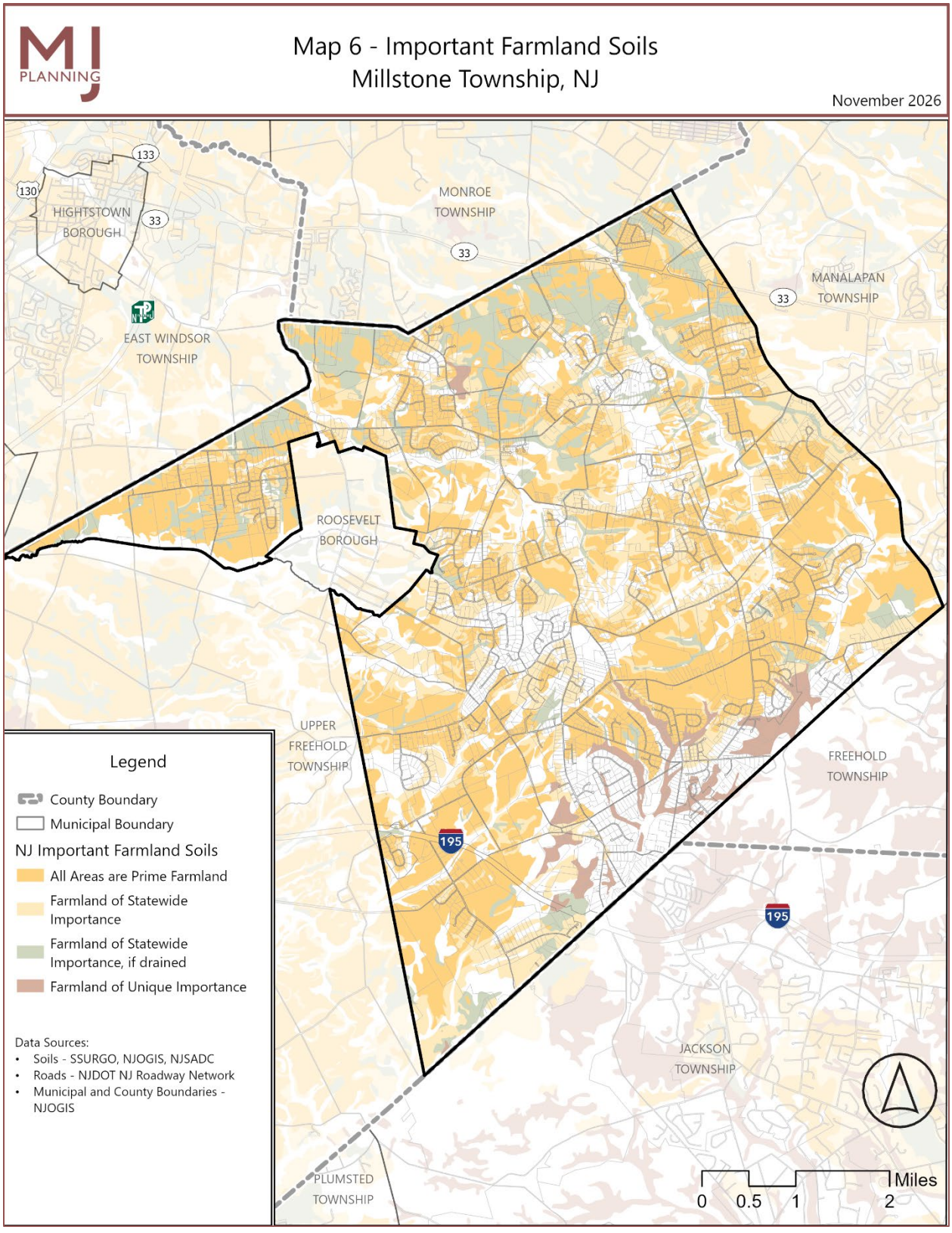
SOILS OF UNIQUE IMPORTANCE

Soils of Unique Importance are soils not identified as prime farmlands or soils of statewide importance that are used to grow specific high-value crops. In Millstone, Atsion Soils and Manahawkin Muck are unique farmlands present within the Township.

TABLE 4 – AGRICULTURALLY IMPORTANT SOILS

Farmland Type	Area (Acres)	Percentage
Prime Farmland	9580.9	40.2%
Farmland of Statewide Importance	5029.5	21.1%
Farmland of Statewide Importance, if Drained	2383	10.0%
Soils of Unique Importance	627.9	2.6%
Other soils	6183.2	26.0%
Total	23804.5	100.0%

[4]https://www.nrcs.usda.gov/sites/default/files/2022-10/New%20Jersey%20Important%20Farmlands%20Inventory.pdf


MJ PLANNING
Map 6 - Important Farmland Soils
Millstone Township, NJ
November 2026
HIGHTSTOWN BOROUGH
EAST WINDSOR TOWNSHIP
MONROE TOWNSHIP
MANALAPAN TOWNSHIP
ROOSEVELT BOROUGH
UPPER FREEHOLD TOWNSHIP
FREEHOLD TOWNSHIP
JACKSON TOWNSHIP
PLUMSTED TOWNSHIP
133
130
33
195
Legend
County Boundary
Municipal Boundary
NJ Important Farmland Soils
All Areas are Prime Farmland
Farmland of Statewide Importance
Farmland of Statewide Importance, if drained
Farmland of Unique Importance
Data Sources:
Soils - SSURGO, NJOGIS, NJSADC
Roads - NJDOT NJ Roadway Network
Municipal and County Boundaries - NJOGIS
0 0.5 1 2 Miles

RADON

Radon is a naturally occurring radioactive gas present in soil and rock. It is tasteless, odorless, and invisible. It poses a hazard to homes and residents as it can enter dwellings through openings that are in contact with soil such as sump pits, foundation cracks, and other small openings. Radon is hazardous to human health and is a known carcinogen that is the leading cause of lung cancer among non-smokers.

According to NJDEP, Millstone has a Tier -1 High Radon Potential Risk Level. The NJDEP data indicates that 454 homes have been tested with 31 percent having elevated radon concentrations.

The Department of Environmental Protection's tier system classifies municipalities as having high, moderate or low potential for indoor radon problems based on the percentage of homes with radon concentrations greater than or equal to 4 picocuries/liter (pCi/L). Tier assignments are based on all testing data available to the Department, including mandatory radon test results reported by certified radon measurement businesses and former voluntary radon test results.[5]

- TIER 1 –High Radon Potential – at least 25 homes tested with 25 percent or more having radon concentrations greater than or equal to 4 pCi/L.
- TIER 2 – Moderate Radon Potential – at least 25 homes tested with 5 to 24 percent having radon concentrations greater than or equal to 4 pCi/L.
- TIER 3 – Low Radon Potential – at least 25 homes tested with less than 5 percent having radon concentrations greater than or equal to 4 pCi/L.

Radon testing can identify elevated levels and mitigation efforts can be undertaken to vent radon from under the basement to above the roof. As part of the venting system installation, cracks and openings in the foundation are sealed to prevent further intrusion.

[5] https://dep.nj.gov/rpp/radon/radon-tier-assignment-report/

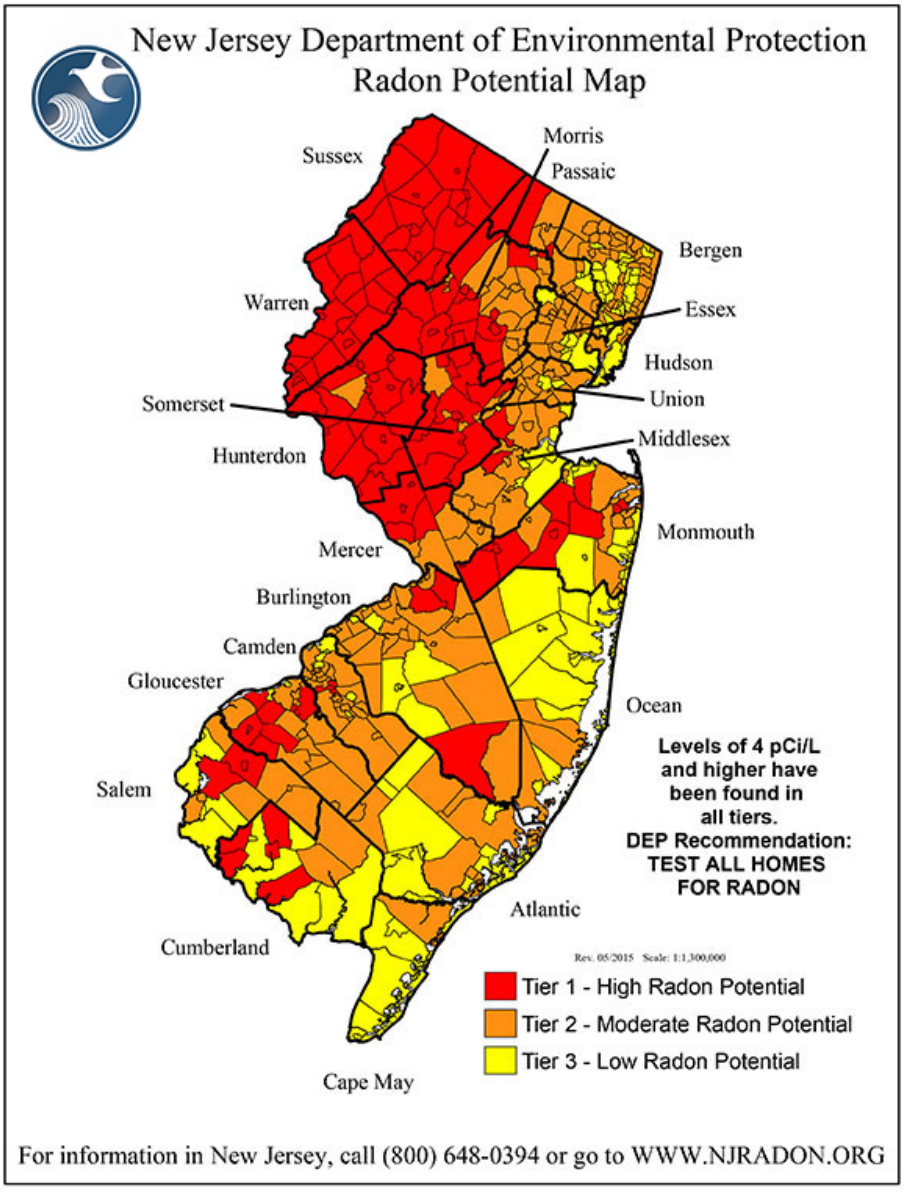


Figure 2 – Radon Potential by Municipality [Source: NJDEP]

SURFACE WATER RESOURCES

WATERSHEDS

Watersheds are defined as the area of land that drains into a body of water. The watershed includes the waterway and the entire land area that drains to it. Watershed management is critically important to the protection of the State's water resources. Pollutants, fertilizers, solid waste, and other environmental contaminants on the land within a watershed eventually enter the water system and degrade its quality.

Watersheds are divided into Hydrologic Units (HU), which encompass the area that drains to a portion of the stream network. The United States Geological Survey (USGS) classifies HUs with unique Hydrologic Unit Codes (HUC) with varying levels of detail. The two most common classifications used for planning and analysis in New Jersey are the 11-digit (HUC-11) watershed and 14-digit (HUC-14) sub-watershed codes.

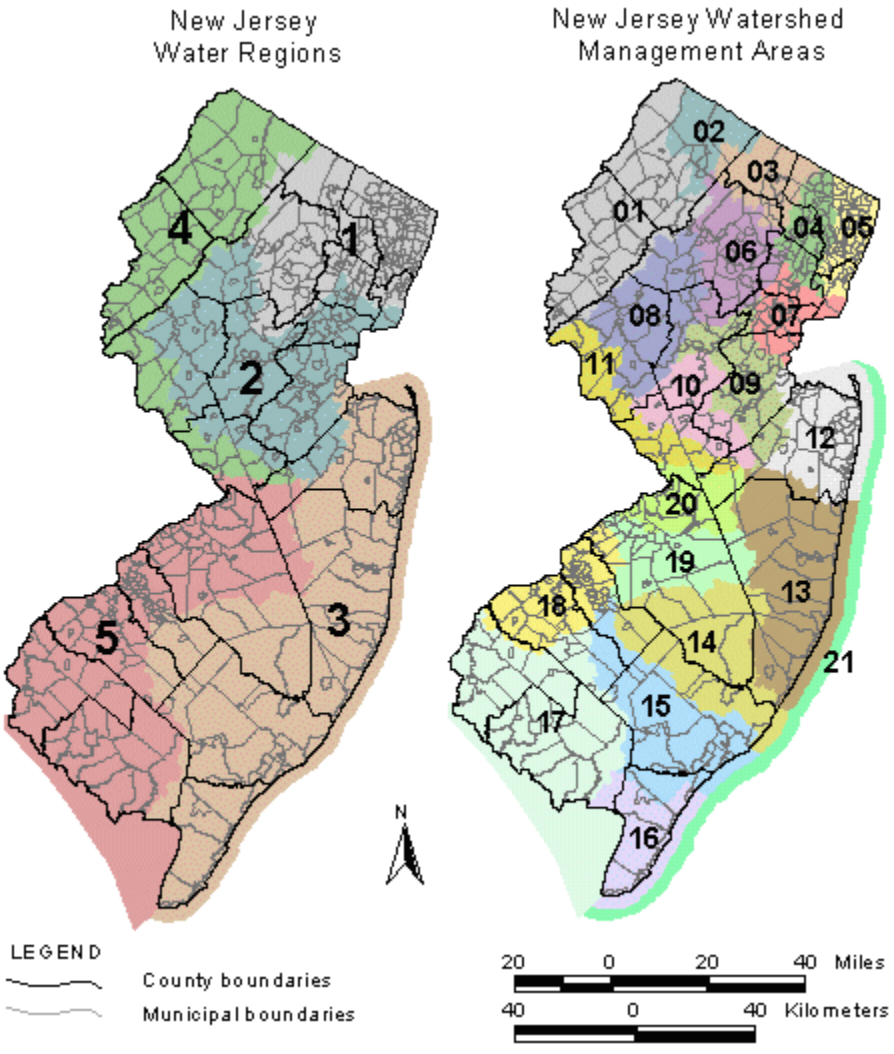


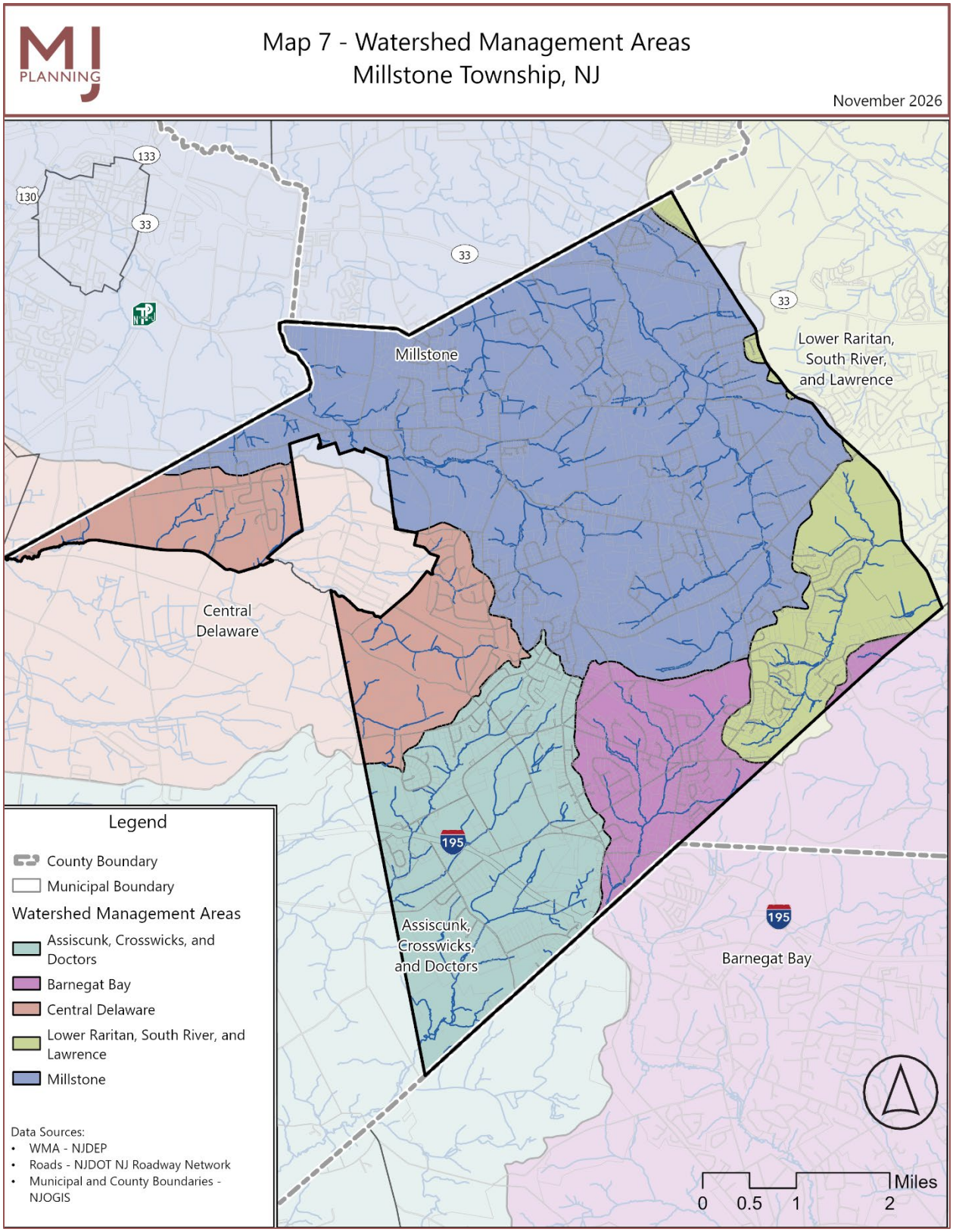
Figure 3 – New Jersey Water Regions and Watershed Management Areas
Source: NJ Geological and Water Survey https://dep.nj.gov/njgws/digital-data/dgs00-2/

NJDEP splits the State into five water regions and twenty Watershed Management Areas (WMAs) to facilitate regional coordination and management of the state's watersheds, which do not conform to county or municipal

boundaries. The central location and relatively high elevations in Millstone uniquely position the Township at the confluence of eight watersheds within five WMAs and four of the state's five water regions. Headwaters for several significant rivers that discharge to the Raritan River, Delaware River, and Barnegat Bay are found int he central part of the Township. There is no other municipality in the state that can claim as diverse an array of watersheds.

TABLE 5 – WATERSHEDS IN MILLSTONE

HUC11	Watershed	Area (Acres)	Pct.	HUC14	Sub-Watershed	Area (Acres)	Pct.	WMA	Water Region
02030105100	Millstone River (above Carnegie Lake)	11,719.8	49.2%	02030105100010	Millstone River (above Rt 33)	4708.0	19.8%	10: Millstone	2: Raritan
				02030105100020	Millstone (Applegarth Road to Rt 33)	2264.3	9.5%		
				02030105100040	Rocky Brook (above Monmouth Co line)	4023.6	16.9%		
				02030105100050	Rocky Brook (below Monmouth Co line)	364.4	1.5%		
				02030105100070	Cranbury Brook (above NJ Turnpike)	359.8	1.5%		
02030105140	Manalapan Brook	2,287.5	9.6%	02030105140010	Manalapan Brook (above 40d 16m 15s)	2219.8	9.3%	9: Lower Raritan, South River, and Lawrence	2: Raritan
				02030105140020	Manalapan (incl Lake Manalapan to 40d16m15s)	67.2	0.3%		
02040105230	Assunpink Creek	3,050.5	12.8%	02040105230010	Assunpink Ck (above Assunpink Lake)	2071.8	8.7%	11: Central Delaware	4: Northwest
				02040105230020	Assunpink Ck (New Sharon Bridge to/incl Lake)	978.8	4.1%		
02040201050	Crosswicks Ck (Doctors Ck to New Egypt)	2,150.4	9.0%	02040201050010	Lahaway Creek (above Prospertown)	2150.4	9.0%	20: Assiscunk, Crosswicks, and Doctors	5: Lower Delaware
02040201060	Doctors Creek	2,413.9	10.1%	02040201060010	Doctors Creek (above 74d28m40s)	2347.8	9.9%	20: Assiscunk, Crosswicks, and Doctors	5: Lower Delaware
				02040201060020	Doctors Creek (Allentown to 74d28m40s)	66.1	0.3%		
02040301020	Metedeconk River NB	91.6	0.4%	02040301020010	Metedeconk NB(above I-195)	91.6	0.4%	13: Barnegat Bay	3: Atlantic Coast
02040301030	Metedeconk River SB	19.3	0.1%	02040301030010	Metedeconk R SB (above I-195 Exit 21)	19.3	0.1%	13: Barnegat Bay	3: Atlantic Coast
02040301060	Toms River (above Oak Ridge Parkway)	2,071.9	8.7%	02040301060010	Toms River (above Francis Mills)	2071.9	8.7%	13: Barnegat Bay	3: Atlantic Coast


MJ PLANNING
Map 7 - Watershed Management Areas
Millstone Township, NJ
November 2026
133
130
33
33
33
Millstone
Lower Raritan, South River, and Lawrence
Central Delaware
195
Assiscunk, Crosswicks, and Doctors
195
Barnegat Bay
Legend
County Boundary
Municipal Boundary
Watershed Management Areas
Assiscunk, Crosswicks, and Doctors
Barnegat Bay
Central Delaware
Lower Raritan, South River, and Lawrence
Millstone
Data Sources:
• WMA - NJDEP
• Roads - NJDOT NJ Roadway Network
• Municipal and County Boundaries - NJOGIS
0 0.5 1 2
Miles

Millstone River (above Carnegie Lake)

The Millstone River Watershed encompasses a 265 square mile area that drains to the Millstone River, whose headwaters are located in Millstone Township. The Millstone River flows north to the Raritan River, which eventually empties into the Raritan Bay. Over 11,700 acres or almost half of the Township is in the Millstone River watershed (49%) which includes five sub-watersheds:

- Millstone River (Above Route 33)
- Millstone River (Applegarth Road to Route 33)
- Rocky Brook (Above the Monmouth County Line)
- Rocky Brook (Below the Monmouth County Line)
- Cranbury Brook (Above the New Jersey Turnpike)

The Millstone River Watershed is part of the Raritan Water region and is in the Millstone WMA, which is jointly managed with the Central Delaware Watershed by the Watershed Institute - https://thewatershed.org/watershed/

Significant surface waters in the Township in the Millstone River watershed include the Millstone River, Rocky Brook, Bentley Brook, and Perrineville Lake.

Assunpink Creek

The Assunpink Creek Watershed is located in the western part of the township in the area generally west and south of the Borough of Roosevelt. Assunpink Creek is the second largest watershed in the Township encompassing an area of about 3,050 acres, or 12.8 percent of the Township's area. The watershed is split into two sub-watersheds: Assunpink Creek above Assunpink Lake, and Assunpink Creek from New Sharon Bridge to Assunpink Lake. The watershed is in the Northwest Water Region and Central Delaware WMA and is managed by the Watershed Institute.

Significant surface waters in the Assunpink Creek Watershed include Assunpink Creek, which is classified as a Category 1, non-trout freshwater, Assunpink Lake, and Rising Sun Lake.

Manalapan Brook

The Malapan Brook Watershed is in the eastern part of the Township with two sub-watersheds, split between the area north and south of the parallel at 40 degrees 16 minutes 15 seconds. Manalapan Brook is the fourth largest watershed in the Township covering about 2,287 acres and just under ten percent of the Township's area. The watershed is in the Raritan Water Region and Lower Raritan, South River, and Lawrence WMA, which is managed by the Lower Raritan Watershed Partnership - https://lowerraritanwatershed.org/

Manalapan Brook and Bulks Lake are significant surface waters in the watershed.

Metedeconk River NB / Metedeconk River SB

The Metedeconk River Northbound Watershed barely enters the southeast corner of the Township. Only 91.6 acres, or less than half a percent of the Township are in the watershed. The Metedeconk River Southbound Watershed encompasses even less of the Township's land area, covering only 19.3 acres. Both Metedeconk River watersheds are in the Atlantic Coast Water Region and in the Barnegat Bay WMA. The Barnegat Bay Partnership manages planning for the watershed - https://barnegatbaypartnership.org/barnegat-bay/ . A short segment of the North Branch of the Metedconk River, which is a Category 1 waterway, is in the Township.

Toms River

The Toms River Watershed covers about 2,070 acres, or about 8.7 percent of the Township. The headwaters of the Toms River are in the southeast part of the Township. Like the Metedeconk Watersheds, the Toms River Watershed is in the Atlantic Coast Water Region and Barnegat Bay WMA.

Crosswicks Creek

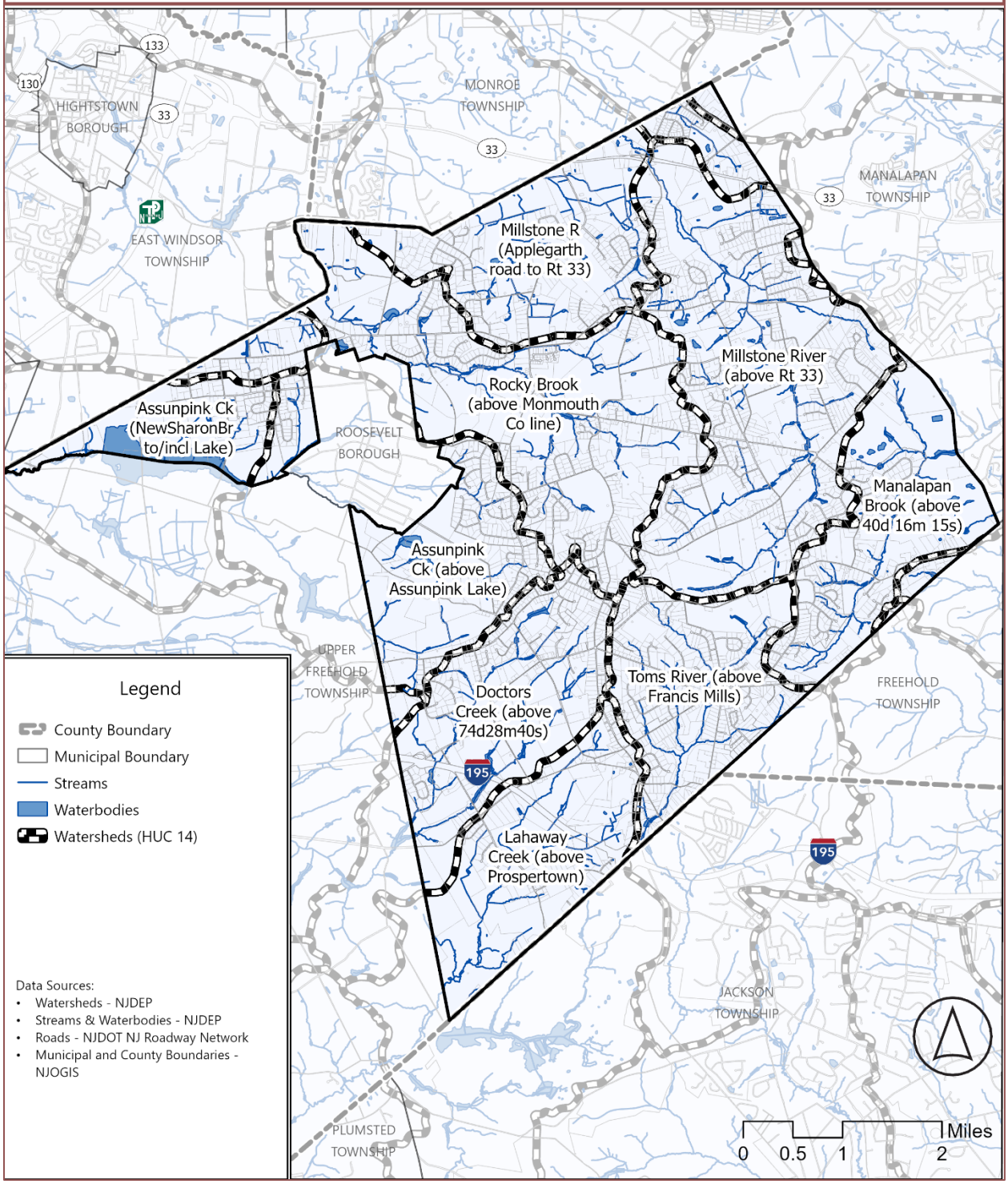
The Crosswicks Creek Watershed is in the southern part of the Township. It covers about 2,150 acres or roughly 9 percent on the Township's area. Crosswicks Creek is in the Assiscunk, Crosswicks, and Doctors WMA and part of the Lower Delaware Water Region. The WMA is managed by the Central New Jersey Watershed Association - https://cnjwa.org/. Ivanhoe Brook is the main surface waterway in the Township within the Watershed.

Doctors Creek

The Doctors Creek Watershed is in the southwest part of Millstone between the Assunpink Creek and Crosswicks Creek watersheds. The Doctors Creek Watershed in the Township is split into two sub-watersheds defined by the areas above and below the longitude line at 74 degrees 28 minutes 40 seconds. The watershed is in the Assiscunk, Crosswicks and Doctors WMA and Lower Delaware Water Region with Crosswicks Creek. Doctors Creek is the main surface water in the Township within the watershed.

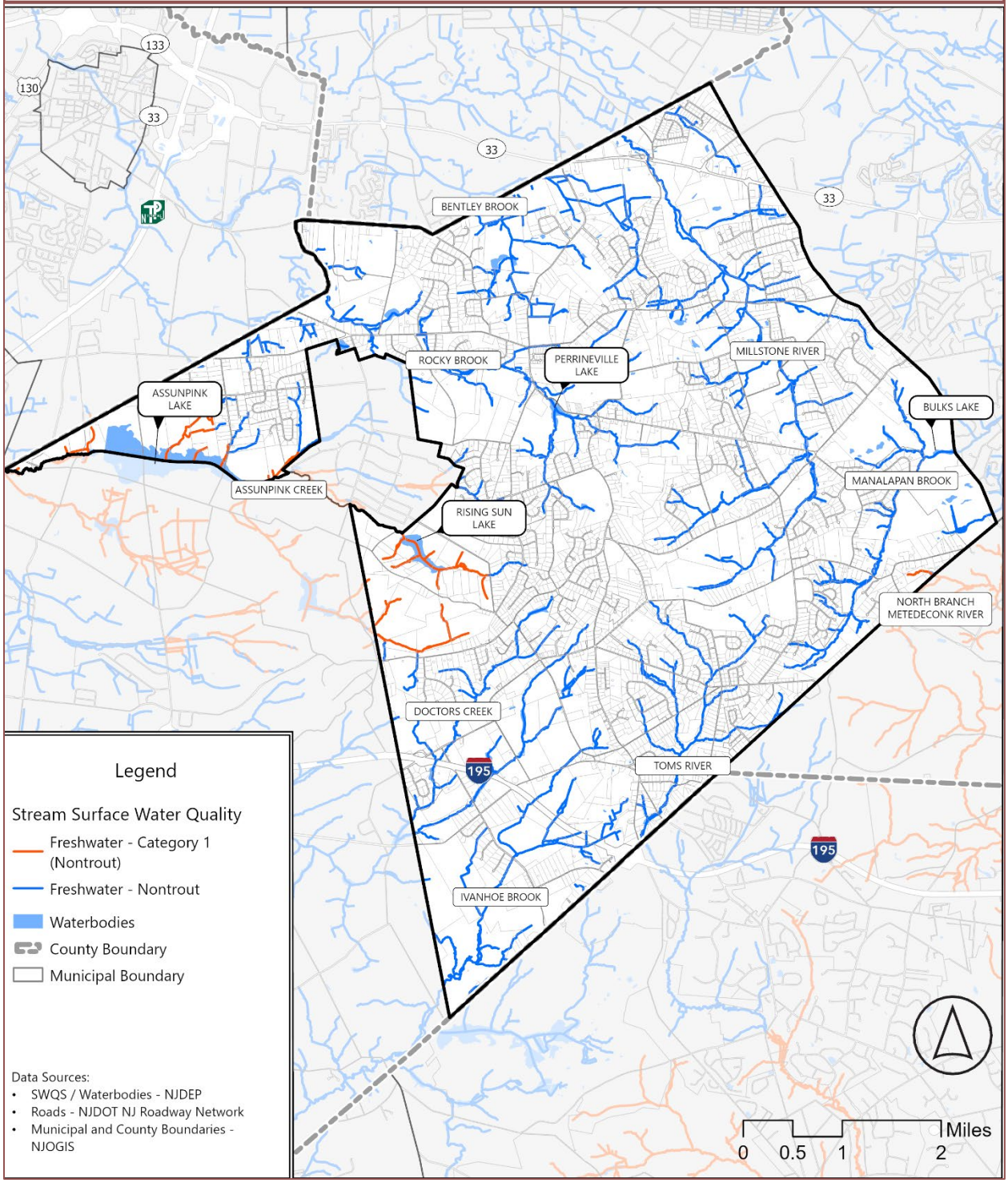
Map 8 - Watersheds (HUC 14)
Millstone Township, NJ

November 2026



Map 9 - Surface Water
Millstone Township, NJ

November 2026



SURFACE WATER CLASSIFICATION

The Surface Water Quality Standards (SWQS), found at N.J.A.C. 7:9B, consist of rules intended to classify New Jersey's surface waters and protect and enhance their quality. The SWQS ensure that waters in New Jersey remain suitable for water supply, recreation, habitat, and other designated uses. Specific categories of identification and protection exist for trout production and maintenance. Water use for agriculture and industrial use is also considered.

Surface waters are classified based on the type of waterbody and the designated use of the waterbody. New Jersey has both fresh and saline waters, although Millstone only has freshwaters. Freshwaters are classified as FW1 waters (not subject to any man-made wastewater discharges), and FW2 waters (all other freshwaters except Pinelands waters). FW1 waters are non-degradation waters set aside for posterity because of their unique ecological significance and considered Outstanding National Resource Waters (ONRW). FW2 waters are further classified based on their ability to support trout, which thrive in cooler stream temperatures. Trout classifications include trout production (FW2-TP), trout maintenance (FW2-TM), and non-trout (FW2-NT).

Surface Water Quality Standards Categories / Antidegradation Designations

OUTSTANDING NATIONAL RESOURCE WATERS

Outstanding Natural Resource Waters (Freshwater 1 and Pineland) are the most protective tier of antidegradation designations and are 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 man-made wastewater discharges or increases 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)."[6] There are no waters identified as ONRW in Millstone.

CATEGORY ONE WATERS

Category One Waters are the second tier of antidegradation designation and are the waters designated in the tables in N.J.A.C. 7:9B-1.15(c) through (i), for purposes of implementing the antidegradation policies set forth at N.J.A.C. 7:9B-1.5(d), for protection from measurable changes in water quality based on exceptional ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resource(s) to protect their aesthetic value (color, clarity, scenic setting) and ecological integrity (habitat, water quality and biological functions).

In Millstone, the following are identified as Category One Waters:

- Assunpink Creek, Assunpink Lake, and tributaries (west side of the Township near Roosevelt and Upper Freehold)
- North Branch Metedeconk River (east side of the Township near Jackson)

CATEGORY TWO WATERS

Category Two Waters are all those not designated as Outstanding National Resource or Category One Waters. Most of the waters in the Township are considered category two waters.

[6] N.J.A.C. 7:9B-1.4

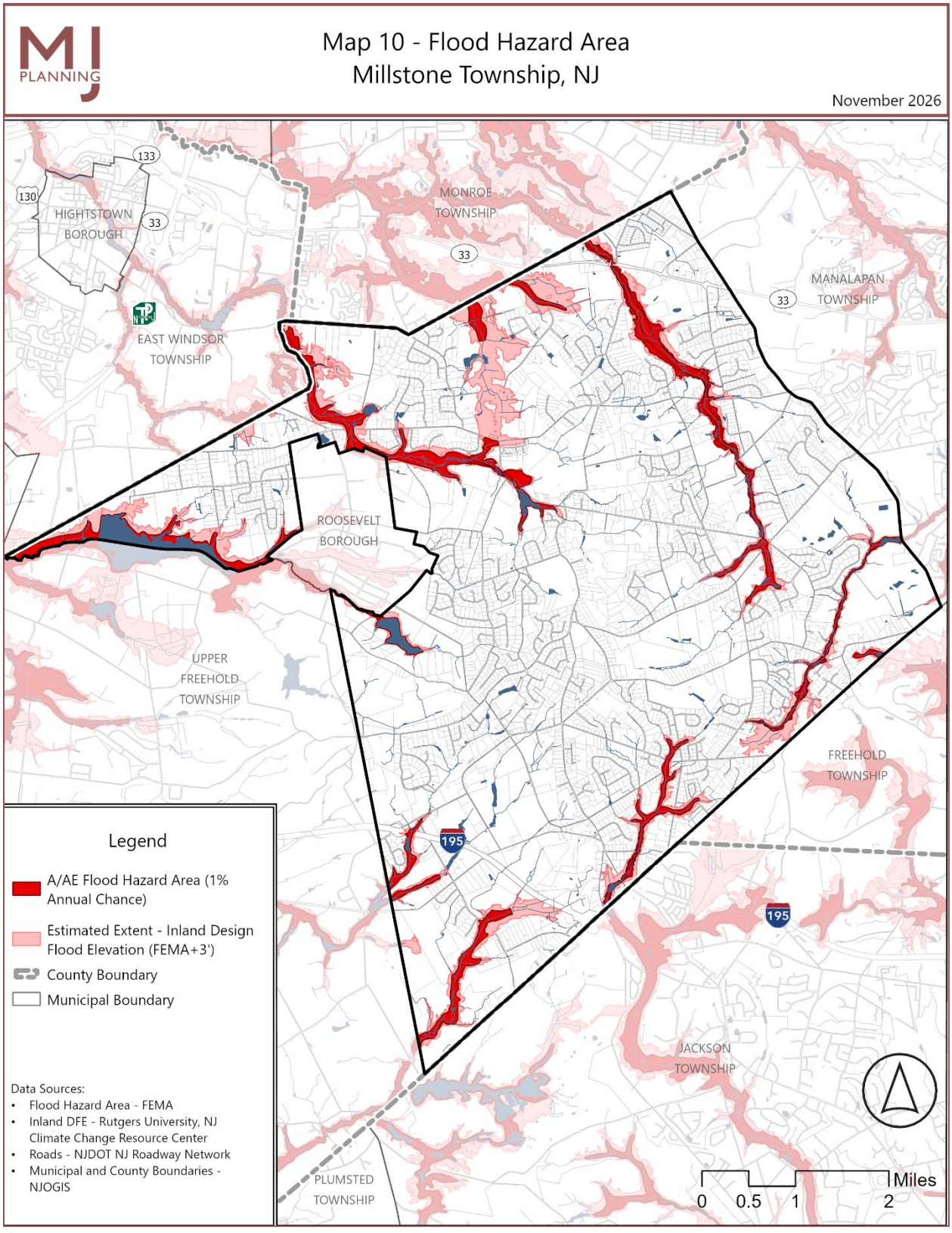
FLOOD HAZARD AREA

According the NJDEP,

> *"The Flood Hazard Area is the land, and the space above that land, which lies below the flood hazard area design flood elevation. The flood hazard area design flood elevation is a flood equal to the 100-year flood plus an additional amount of water in fluvial areas to account for possible future increases in flows due to development or other factors. This additional amount of water also provides a factor of safety in cases when the 100-year flood is exceeded."*

Pursuant to N.J.A.C. 7:13-2.3, a flood hazard area and a riparian zone exist along every regulated water that has a drainage area of 50 acres or more. In 2023, the NJDEP adopted its Inland Flood Protection Rule, establishing a new Design Flood Elevation standard. The new standard is 3 feet above the elevation of the 1% Chance Annual Flood for New Jersey.

Approximately 5.3 percent of Millstone is located within the 1% Chance Annual Flood area as mapped by FEMA on the Flood Insurance Rate Maps, and an additional 6.2 percent of the Township falls within the NJ Inland Design Flood Elevation area as estimated by mapping work done by Rutgers University. A total of about 11.5 percent of the Township is potentially impacted by the state regulated flood hazard area. Both the 1% Chance Annual Flood area and the additional three feet above the FEMA 1% Chance Annual Flood area in Millstone are shown in Map 10.


MJ PLANNING
Map 10 - Flood Hazard Area
Millstone Township, NJ
November 2026
HIGHTSTOWN BOROUGH
EAST WINDSOR TOWNSHIP
MONROE TOWNSHIP
MANALAPAN TOWNSHIP
ROOSEVELT BOROUGH
UPPER FREEHOLD TOWNSHIP
FREEHOLD TOWNSHIP
JACKSON TOWNSHIP
PLUMSTED TOWNSHIP
133
130
33
195
Legend
A/AE Flood Hazard Area (1% Annual Chance)
Estimated Extent - Inland Design Flood Elevation (FEMA+3')
County Boundary
Municipal Boundary
Data Sources:
• Flood Hazard Area - FEMA
• Inland DFE - Rutgers University, NJ Climate Change Resource Center
• Roads - NJDOT NJ Roadway Network
• Municipal and County Boundaries - NJOGIS
0 0.5 1 2 Miles

WETLANDS

Wetlands are defined by the NJDEP in the Freshwater Wetlands Protection Act as "are a that is inundated or saturated by surface water mor groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation."[7]

Wetlands have numerous important environmental functions including protecting and preserving drinking water supplies, providing natural flood and stormwater storage, preventing soil erosion as a buffer between uplands and water courses, serving as habitat and breeding areas for fish and wildlife including migrating birds, and contributing to the state's recreational resources. The state began regulating freshwater wetlands in 1987 in response to development pressure and a recognized need to create stringent limitations on the disturbance of wetlands and surrounding areas to maintain their important natural functions.

The NJDEP Land Use / Land Cover data set derived from processed aerial imagery provides a general sense of wetland location and extent throughout the state. Map 11 shows the location of streams, waterbodies, and wetlands in Millstone and its surrounding areas. Field verification is necessary to define the extent of a particular wetland when evaluating development and/or preservation opportunities on a given piece of property. Field verifications are reviewed by the NJDEP through an application for a Letter of Interpretation (LOI) that defines the location of the wetland and the resource value. NJDEP regulations classify wetlands into three groups: exceptional resource value, intermediate resource value, and ordinary resource value.

Wetlands with exceptional resource values are those that:

1. Discharge into FW-1 or FW-2 trout production waters or their tributaries;
2. Is a present habitat for threatened or endangered species; or
3. Is a documented habitat for threatened or endangered species, and which remains suitable for breeding, resting, or feeding by these species during the normal period these species would use the habitat.

Exceptional resource value wetlands have a required transition area of 150 feet, which is regulated and can potentially be modified through a transition area waiver.

Wetlands of ordinary resource value are those that are not exceptional resource value wetlands and are:

1. An isolated wetland that:
    a. Is smaller than 5,000 square feet; and
    b. Has the uses listed below covering more than 50 percent of the area within 50 feet of the wetland boundary. In calculating the area covered by a use, the Department will only consider a use that was legally existing in that location prior to July 1, 1988, or was permitted [in accordance with applicable regulations] since that date:
        i. Lawns;
        ii. Maintained landscaping;
        iii. Impervious surfaces;
        iv. Active railroad rights-of-way; and
        v. Gravelled or stoned parking/storage areas and roads;

[7] N.J.S.A. 13:9B-3

2. A drainage ditch;
3. A swale; or
4. A detention facility created by humans in an area that was upland at the time the facility was created regardless of the wetland resource classification of the wetland under this chapter, or the classification of the body of water, as FW-1 or FW-2 trout production, to which it discharges.

Ordinary resource wetlands do not have a required transition area.

Freshwater wetlands of intermediate resource value are those that are neither defined as exceptional nor ordinary. Intermediate resource value wetlands have a required 50-foot-wide transition area.[8]

DELAWARE AND RARITAN CANAL[9]

The "Delaware and Raritan Canal State Park Law of 1974" established the Delaware and Raritan Canal Commission and directs the Commission to preserve and protect the D&R Canal as a historic and natural resource and water supply system for much of central New Jersey. The rules established for regulating the Canal area in the New Jersey Administrative Code give the Commission jurisdiction over development review projects located within a defined "Review Zone". The Commission's review focuses on the impact on:

1. Stormwater drainage and water quality;
2. Stream corridors;
3. Visual, historic and natural quality; and
4. Traffic.

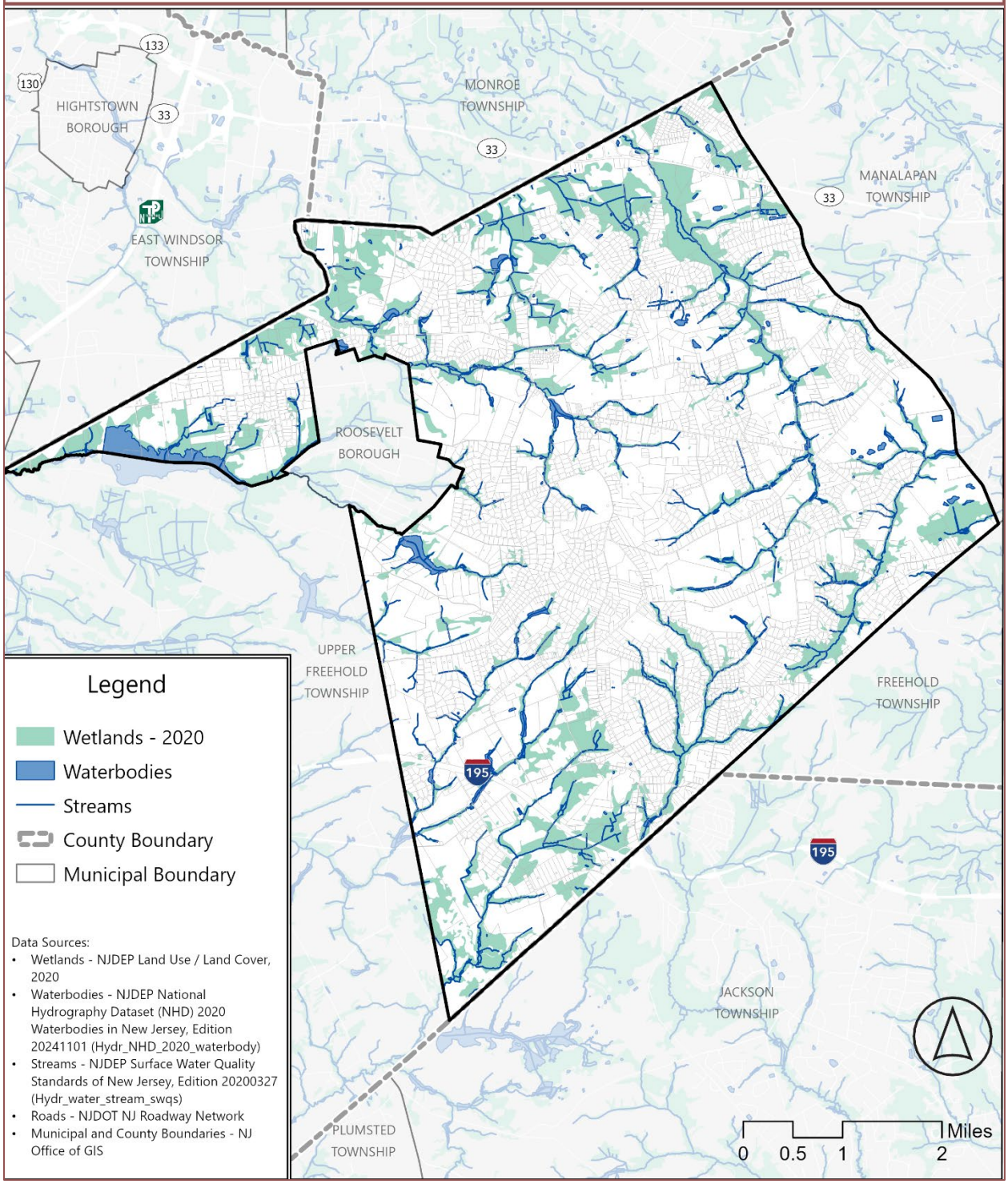
The Review Zone, shown on Map 12, is divided into two subzones:

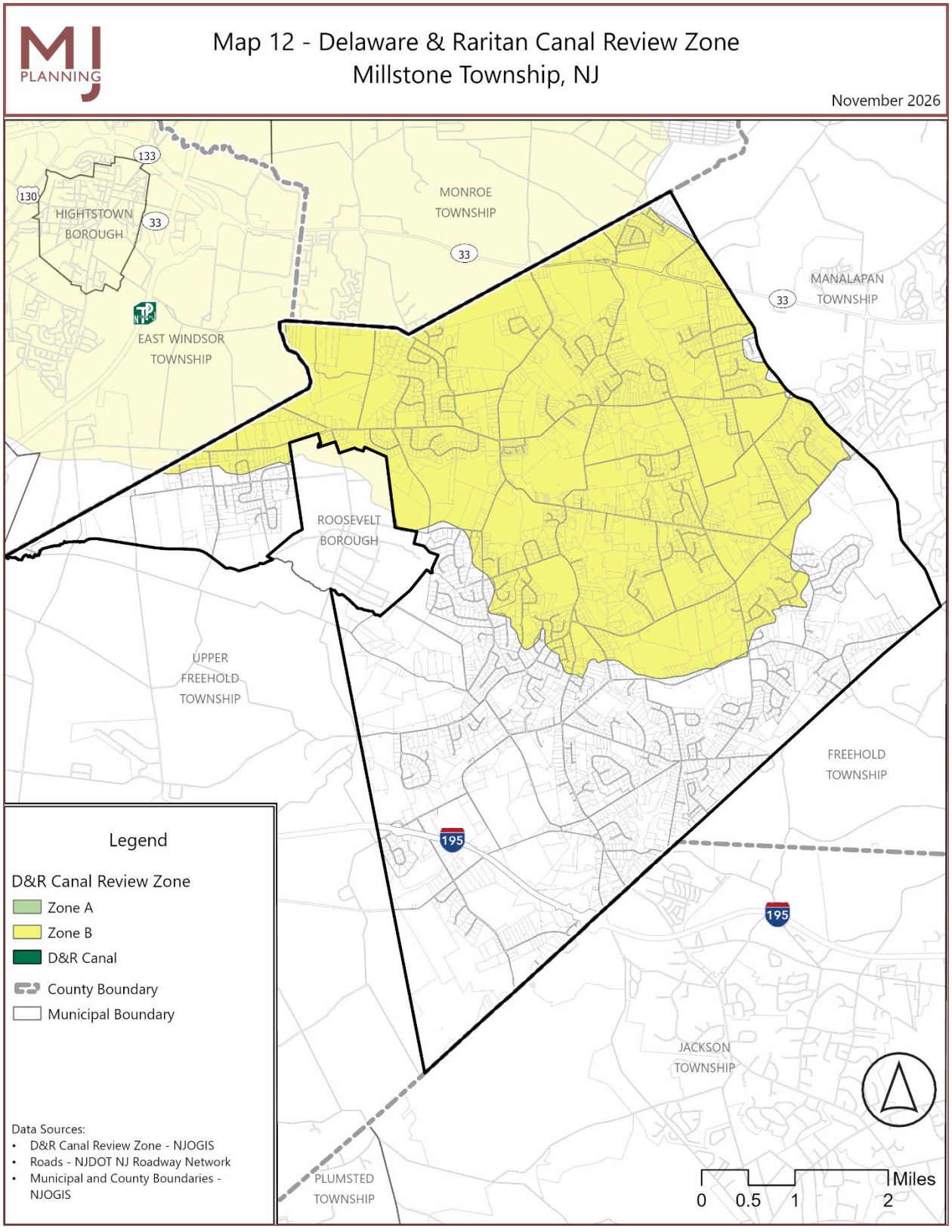
- Zone "A" is the area within 1,000 feet on either side of the center line of the canal, except in the Municipality of Princeton, where the west bank of Carnegie Lake shall be the boundary of Zone A, and where the Raritan River is within 1,000 feet, its furthest bank being the boundary.
- Zone "B" is based upon sub-watersheds located in central New Jersey that impact the Delaware and Raritan Canal, which extends into the northern and central portions of Millstone.

[8] N.J.A.C. 7:7A-3.2
[9] https://www.nj.gov/dep/drcc/regulatory-program/overview/

Map 11 - Wetlands and Surface Water
Millstone Township, NJ

November 2026




MJ PLANNING
Map 12 - Delaware & Raritan Canal Review Zone
Millstone Township, NJ
November 2026
HIGHTSTOWN BOROUGH
MONROE TOWNSHIP
EAST WINDSOR TOWNSHIP
MANALAPAN TOWNSHIP
ROOSEVELT BOROUGH
UPPER FREEHOLD TOWNSHIP
FREEHOLD TOWNSHIP
JACKSON TOWNSHIP
PLUMSTED TOWNSHIP
133
130
33
195
Legend
D&R Canal Review Zone
Zone A
Zone B
D&R Canal
County Boundary
Municipal Boundary
Data Sources:
• D&R Canal Review Zone - NJOGIS
• Roads - NJDOT NJ Roadway Network
• Municipal and County Boundaries - NJOGIS
0 0.5 1 2
Miles

RIPARIAN ZONES

Riparian zones exist along every regulated water in New Jersey with a few limited exceptions. Riparian zones are a defined distance from the top of the bank along both sides of a regulated water. The width of the required riparian zone is 50 feet, 150 feet, or 300 feet depending on the quality of the environmental resource associated with the water. Riparian zone regulations, found in the Flood Hazard Area Control Act and applicable rules at N.J.A.C. 7:13, are designed to protect the vegetated areas along watercourses and waterbodies. These natural and vegetated areas provide flood storage and manage runoff, support habitat, stabilize stream banks and prevent erosion, and enhance water quality through natural filtration.

A 300 foot riparian zone is required along any Category One water and all upstream tributaries thereof in the same HUC-14 watershed.

A 150 foot riparian zone is required along:

1. Any water designated as a trout production water and all upstream waters and tributaries;
2. Any trout maintenance water and all upstream waters and tributaries within one mile of a trout maintenance water;
3. Any segment of a water flowing through an area that contains documented habitat for a threatened or endangered species of plant or animal, which is critically dependent on the water for survival, and all upstream waters (including tributaries) within one linear mile as measured along the length of the regulated water; and
4. Any segment of a water flowing through an area that contains acid producing soils.

A 50 foot riparian zone is required along all other waters that do not require a 150 or 300 foot zone.

The portions of the Township where Category One waters are located require a 300 foot riparian zone. There are no trout production or maintenance waters in Millstone; however, there are areas with acid producing soils and areas with habitat and potential habitat for threatened or endangered species, so waters in portions of the Township are subject to the 150 foot riparian zone requirement.

WATER QUALITY MONITORING

The Bureau of Freshwater and Biological Monitoring (BFBM) is responsible for numerous multi-year monitoring programs mandated by the Clean Water Act, some of which have served as prototypes for the nation. BFBM assesses the quality of New Jersey's ground water, rivers, streams and lakes through statewide and regional monitoring networks and implements New Jersey's Cyanobacterial Harmful Algal Blooms (HABs) Freshwater Recreational Response to protect public health, drinking water, and recreational uses.

Ambient Surface Water Quality Monitoring Network (ASWQMN)[10]

The Ambient Surface Water Quality Network (ASWQMN) is a system designed to collect statewide water-quality data to determine water-quality status and trends. The 126 monitoring stations are maintained by the USGS New Jersey Water Science Center in cooperation with NDJEP, New Jersey Water Supply Authority, and the Delaware River Basin Commission. The surface-water-quality monitoring sites include 76 fixed sites and 50 sites that are selected randomly every two (2) years. All stations are sampled quarterly to collect field

[10] https://www.usgs.gov/centers/new-jersey-water-science-center/science/new-jersey-ambient-surface-water-quality-monitoring

parameters, concentration of various nutrients, particulates, chemicals, and elements, as well as other variables.

There are currently no ASWQMN stations in Millstone.

Ambient Macroinvertebrate Network (AMNET)[11]

The Ambient Macroinvertebrate Network (AMNET) is a NJDEP program that assesses collected macroinvertebrates, physical and chemical parameters including pH, nutrients, and turbidity, to evaluate the water quality. Macroinvertebrates are commonly found throughout the state's waterways and reflect changes

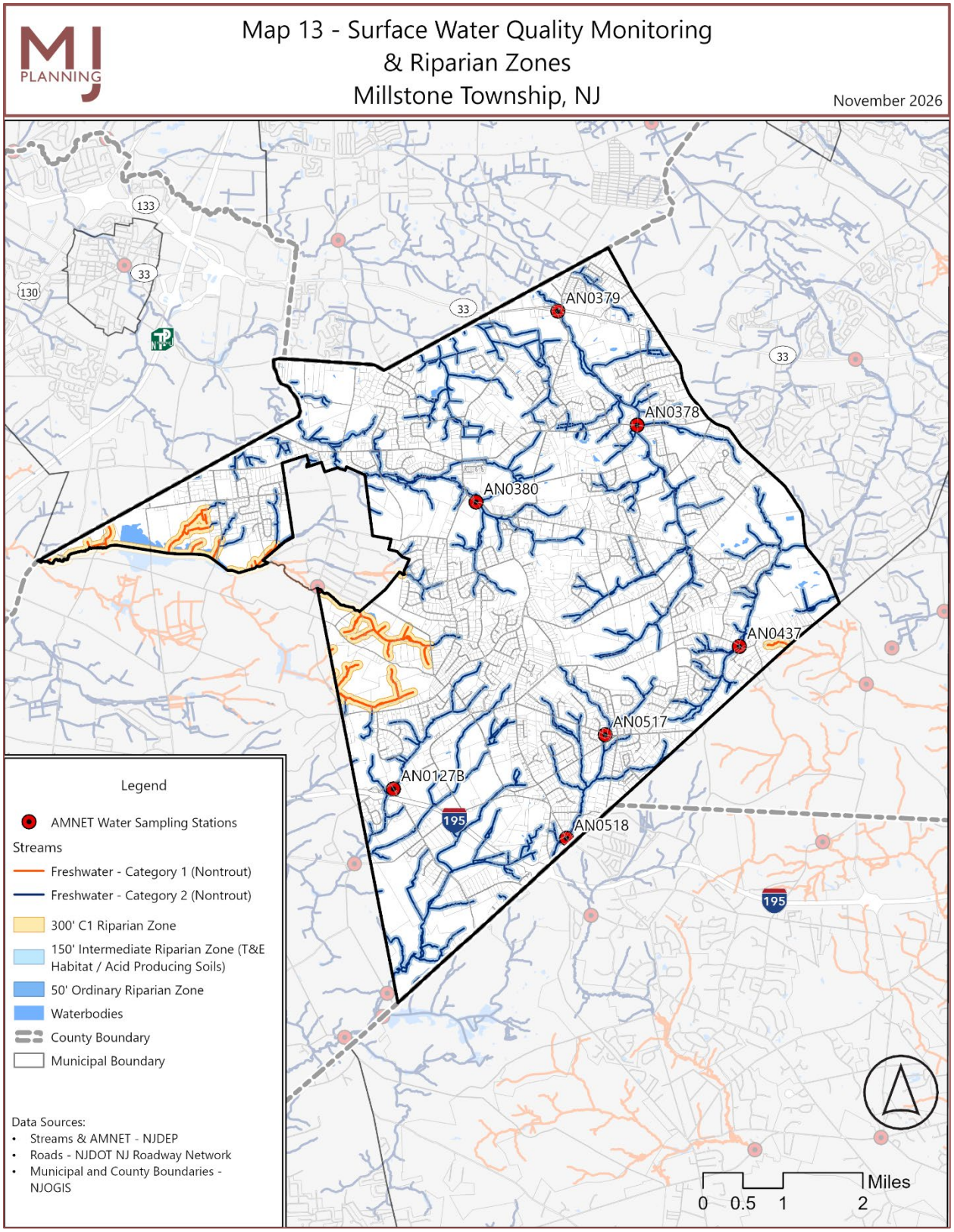
in environmental conditions. The changes in the macroinvertebrate community are measures and incorporated into an overall index of ambient water quality. Additional uses of AMNET data include evaluating attainment of aquatic life uses, the biennial statewide Integrated Water Quality Assessment Report, and the designation of Category 1 waters.

Results of AMNET sampling are rated to reflect stream impairment as Excellent, Good, Fair, or Poor. NJDEP samples the States's water regions once every five years on a rotational schedule. Of the over 750 AMNET sites, seven (7) are located within Millstone. Monitoring results for the stations within Millstone are shown below.

TABLE 6 - AMNET STATIONS IN MILLSTONE

Site Number	Waterway	Location	Impairment (Round 6)
AN0517	Toms River	Paint Island Road	Fair
AN0518	Toms River	Route 571	Fair
AN0378	Millstone River	Baird Road	Good
AN0437	Manalapan Brook	Route 524	Good
AN0379	Millstone River	Route 33	Poor
AN0380	Rocky Brook	Perrineville Road	Fair
AN0127B	Doctors Creek	Haven Hollow Road	Good

[11] https://dep.nj.gov/wms/bfbm/ambient-macroinvertebrate-network-amnet/


Map 13 - Surface Water Quality Monitoring
& Riparian Zones
Millstone Township, NJ
November 2026
MJ PLANNING
AN0379
AN0378
AN0380
AN0437
AN0517
AN0127B
AN0518
133
33
130
195
Legend
AMNET Water Sampling Stations
Streams
Freshwater - Category 1 (Nontrout)
Freshwater - Category 2 (Nontrout)
300' C1 Riparian Zone
150' Intermediate Riparian Zone (T&E Habitat / Acid Producing Soils)
50' Ordinary Riparian Zone
Waterbodies
County Boundary
Municipal Boundary
Data Sources:
• Streams & AMNET - NJDEP
• Roads - NJDOT NJ Roadway Network
• Municipal and County Boundaries - NJOGIS
0 0.5 1 2
Miles

NEW JERSEY INTEGRATED REPORT

The New Jersey Integrated Water Quality Assessment Report, or Integrated Report, is prepared by the NJDEP as a biennial assessment of the State's water quality. The Integrated Report identifies and prioritizes waters or protection, restoration, and those in need of additional monitoring. The Integrated Report's assessment supports the protection of water resources and the implementation of the federal Clean Water Act, the New Jersey Water Quality Planning Act, and the New Jersey Water Pollution Control Act.

Water quality assessments are categorized into three categories, Fully Supporting, Not Supporting, or Insufficient Data for assessment. These categories are organized into sub-lists as indicated by the EPA. Sub-lists 1 and 2 identify waters assessed as Fully Supporting designated uses with no uses threatened. Sub-list 3 identifies waters where there is Insufficient Data and information to determine if the designated use is fully supported or not supported.

Sub-list 4 includes one or more designated uses that are Not Supported or are threatened and Sub-list 5, which is synonymous with the "303(d) List" required by the EPA, includes one or more designated uses that are Not Supported or are threatened by a pollutant(s), that requires development of a Total Maximum Daily Load (TMDL) analysis. Pollutants placed on the 303(d) List also identify their priority ranking for TMDL development (High, Medium, Low.)

A TMDL, or Total Maximum Daily Load, is the maximum amount of a particular pollutant that a waterbody can receive while still meeting surface water quality standards for its designated uses. According the EPA:

> "the objective of a TMDL is to determine the loading capacity of the waterbody and to allocate that load among different pollutant sources so that the appropriate control actions can be taken and water quality standards achieved. The TMDL process is important for improving water quality because it serves as a link in the chain between water quality standards and implementation of control actions designed to attain those standards."[12]

Upon approval of the TMDL by the EPA, the TMDL is adopted as an amendment to the applicable water quality management plans. The TMDL implementation plan will include guidance for required permit changes, additional measures, and recommended best management practices.[13]

While Sub-list 5 requires a TMDL, Sub-list 4 does not require a TMDL due to either a TMDL having been completed, other pollutant control measures are expected to result in supporting the use, or because water quality impairment is identified as caused by something else.

TABLE 7 - IMPAIRED SURFACE WATERS IN MILLSTONE LISTED ON SUB-LIST 4

HUC14	Assessment Unit Name	Parameter	TMDL Number	TMDL Date
02040105230020	Assunpink Ck (NewSharonBr to/incl Lake)	Mercury In Fish Tissue	40821	2011
02030105100070	Cranbury Brook (above NJ Turnpike)	Escherichia Coli (E. Coli)	10593	2003
02040201060020	Doctors Creek (Allentown to 74d28m40s)	Escherichia Coli (E. Coli)	9903	2003
02040201060020	Doctors Creek (Allentown to 74d28m40s)	Phosphorus, Total	10569/33757	2003/2006
02030105140010	Manalapan Brook (above 40d 16m 15s)	Escherichia Coli (E. Coli)	9954	2003
02030105140020	Manalapan Brook (incl LakkManlpn to 40d16m15s)	Escherichia Coli (E. Coli)	9954	2003

[12] https://www.epa.gov/tmdl/overview-total-maximum-daily-loads-tmdls
[13] https://dep.nj.gov/wp-content/uploads/bears/generic-tmdl-factsheet.pdf

02030105140020	Manalapan Brook (incl LkManlpn to 40d16m15s)	Phosphorus, Total	10559	2003
02030105100010	Millstone R (above Rt 33)	Escherichia Coli (E. Coli)	9948	2003
02030105100010	Millstone R (above Rt 33)	Phosphorus, Total	65982	2016
02030105100010	Millstone R (above Rt 33)	Total Suspended Solids	65982	2016
02030105100020	Millstone R (Applegarth road to Rt 33)	Escherichia Coli (E. Coli)	9948	2003
02030105100020	Millstone R (Applegarth road to Rt 33)	Phosphorus, Total	65982	2016
02030105100020	Millstone R (Applegarth road to Rt 33)	Total Suspended Solids	65982	2016
02030105100050	Rocky Brook (below Monmouth Co line)	Mercury In Fish Tissue	37909	2020
02030105100050	Rocky Brook (below Monmouth Co line)	Phosphorus, Total	65982	2016
02040301060010	Toms River (above Francis Mills)	Escherichia Coli (E. Coli)	10503	2003

TABLE 8 - IMPAIRED SURFACE WATERS IN MILLSTONE LISTED ON SUB-LIST 5

HUC14	Assessment Unit Name	Parameter	TMDL Ranking
02030105100010	Millstone R (above Rt 33)	Arsenic	Low
02030105100010	Millstone R (above Rt 33)	Biological-Cause Unknown	Low
02030105100020	Millstone R (Applegarth road to Rt 33)	Arsenic	Low
02030105100020	Millstone R (Applegarth road to Rt 33)	Biological-Cause Unknown	Low
02030105100040	Rocky Brook (above Monmouth Co line)	Arsenic	Low
02030105100050	Rocky Brook (below Monmouth Co line)	Arsenic	Low
02030105100050	Rocky Brook (below Monmouth Co line)	Dieldrin In Fish Tissue	Low
02030105100050	Rocky Brook (below Monmouth Co line)	Dissolved Oxygen	Medium
02030105100050	Rocky Brook (below Monmouth Co line)	PCBs In Fish Tissue	Low
02030105140020	Manalapan Brook (incl LkManlpn to 40d16m15s)	DDT In Fish Tissue	Low
02030105140020	Manalapan Brook (incl LkManlpn to 40d16m15s)	PCBs In Fish Tissue	Low
02040105230010	Assunpink Ck (above Assunpink Lake)	Arsenic	Low
02040105230010	Assunpink Ck (above Assunpink Lake)	Escherichia Coli (E. Coli)	Medium
02040105230010	Assunpink Ck (above Assunpink Lake)	Biological-Cause Unknown	Low
02040105230010	Assunpink Ck (above Assunpink Lake)	Phosphorus, Total	Medium
02040105230020	Assunpink Ck (NewSharonBr to/incl Lake)	Arsenic	Low
02040105230020	Assunpink Ck (NewSharonBr to/incl Lake)	Dissolved Oxygen	Medium
02040105230020	Assunpink Ck (NewSharonBr to/incl Lake)	Biological-Cause Unknown	Low
02040105230020	Assunpink Ck (NewSharonBr to/incl Lake)	Phosphorus, Total	Medium
02040201050010	Lahaway Ck (above Prospertown)	Arsenic	Low
02040201050010	Lahaway Ck (above Prospertown)	Mercury In Fish Tissue	Low
02040201050010	Lahaway Ck (above Prospertown)	Phosphorus, Total	Medium
02040201060010	Doctors Creek (above 74d28m40s)	Arsenic	Low
02040201060020	Doctors Creek (Allentown to 74d28m40s)	Arsenic	Low
02040201060020	Doctors Creek (Allentown to 74d28m40s)	Total Suspended Solids	Medium
02040301060010	Toms River (above Francis Mills)	Dissolved Oxygen	Medium
02040301060010	Toms River (above Francis Mills)	Biological-Cause Unknown	Low
02040301060010	Toms River (above Francis Mills)	Phosphorus, Total	Medium

CAUSES OF WATER QUALITY IMPAIRMENTS

Stormwater and Impervious Surfaces

The EPA estimates the nonpoint source pollution, such as stormwater runoff, is the leading cause of water quality impairment. Nonpoint source pollution has no single discharge point and is therefore difficult to regulate. Stormwater runoff is directly associated with impervious surfaces that reduce infiltration and increase surface runoff. Common impervious surfaces include roads, parking lots, rooftops, driveways and sidewalks, and compacted soils. Stormwater runoff volume increases with the amount of impervious coverage.

Stormwater runoff increases the delivery of pollutants from the landscape to water sources. Common pollutants found in stormwater runoff include sediment, nutrients, pesticides, oil, grease, wear metals, and other organic pollutants.

Inadequate Buffers – Riparian Zones / Wetlands

As discussed previously, riparian zones are a defined distance from the top of the bank along both sides of a regulated water. Wetlands and riparian zones act as natural buffers of nonpoint source pollutants, filtering soil and pollutants from water flowing over the surface, slowing the transport of contaminants. Preservation and restoration of wetlands and riparian zones should be prioritized, as they can play a significant role in managing adverse water quality impacts.

Point Sources of Pollution

Point source pollution is defined by the EPA as "any single identifiable source of pollution from which pollutants are discharged, such as a pipe, ditch, ship or factory smokestack." Unregulated point source discharges can result in unsafe water pollution.

The Clean Water Act established the National Pollutant Discharge Elimination System (NPDES) to control point source discharge. Under the NPDES program, point sources must obtain a permit from the state and EPA before they can discharge into any body of water. Additionally, the point source is required to first treat all waste to reduce the level of pollutants.

The Table 9 contains a list of active NJPDES permits in Millstone, excluding active permits in the Construction Activity Stormwater permit category (5G3) due to their temporary duration.

TABLE 9 – NJPDES PERMITS IN MILLSTONE

NJPDES Permit No.	Address	Facility Name	Expiration	Discharge Category
NJ0329754	711 Perrineville Rd	Millstone Commons	09/30/30	Discharge to Groundwater (IP) (GW)
NJG0133710	7 Yellow Meeting House Rd	Frogbridge Day Camp	07/31/29	Discharge to Ground Water - Sanitary Discharge (GP) (GWSD)
NJG0135194	520 Rt 33	The Chozhas	06/30/30	Sanitary Subsurface Disposal (GP) (T1)
NJG0136051	Monmouth County Rt 537	Burger King Restaurant	06/30/30	Sanitary Subsurface Disposal (GP) (T1)
NJG0140317	457 Stage Coach Rd	Black Bear Day Camp	06/30/30	Sanitary Subsurface Disposal (GP) (T1)
NJG0140538	380 Monmouth Rd	YMCA Camp Topanemus	06/30/30	Sanitary Subsurface Disposal (GP) (T1)
NJG0140767	548 Monmouth Rd	Wawa Food Market #909	07/31/29	Discharge to Ground Water - Sanitary Discharge (GP) (GWSD)
NJG0153532	470 Stage Coach Rd	Millstone Twp	12/31/27	MS4 - Tier A Municipal Stormwater (GP) (R9)
NJG0170381	306 Sweetmans Ln	Defilippis James DDS	08/31/30	Dental Facilities Onsite WW Treatment Systems (GP) (K2)
NJG0171352	15 Carrs Tavern Rd	Jerry N. Falk Family Dentistry	08/31/30	Dental Facilities Onsite WW Treatment Systems (GP) (K2)
NJG0171590	494 Rt 537	James C Burden DMD	08/31/30	Dental Facilities Onsite WW Treatment Systems (GP) (K2)
NJG0208779	380 Rt 33 W	Millstone Center	06/30/30	Sanitary Subsurface Disposal (GP) (T1)
NJG0210901	Rt 33 W	Riverside Center LLC	07/31/29	Discharge to Ground Water - Sanitary Discharge (GP) (GWSD)
NJG0211168	514 Rt 33 E	New Paradigm Dentistry	08/31/30	Dental Facilities Onsite WW Treatment Systems (GP) (K2)
NJG0213811	200 Rike Dr	Greif Packaging LLC	01/31/28	Basic Industrial Stormwater (GP) (5G2)
NJG0235997	18 Schoolhouse Rd	Millstone Elementary School	12/31/30	Sludge Quality Exempt (GP) (SXG)
NJG0236047	101 Woodville Rd	Charleston Springs Golf Course	12/31/30	Sludge Quality Exempt (GP) (SXG)
NJG0236071	7 Yellow Meeting House Rd	Frogbridge Day Camp	12/31/30	Sludge Quality Exempt (GP) (SXG)
NJG0236110	542 Monmouth Rd	Mcdonald's Restaurant	12/31/30	Sludge Quality Exempt (GP) (SXG)
NJG0236128	548 Monmouth Rd	Wawa Food Market #909	12/31/30	Sludge Quality Exempt (GP) (SXG)
NJG0236161	5 Dawson Ct	Millstone Twp New Middle School	12/31/30	Sludge Quality Exempt (GP) (SXG)
NJG0236209	Rt 33 West	Riverside Center LLC	12/31/30	Sludge Quality Exempt (GP) (SXG)
NJG0252905	23 Burnt Tavern Rd	Green Leaf Pet Resort	06/30/30	Sanitary Subsurface Disposal (GP) (T1)
NJG0304182	508 Monmouth Rd	Millstone River Mart	12/31/30	Sludge Quality Exempt (GP) (SXG)
NJG0317365	505 Rt 33	Millstone Logistics Center	12/31/30	Sludge Quality Exempt (GP) (SXG)
NJG0355283	27 Burnt Tavern Rd	27 Burnt Tavern Road	07/31/29	Discharge to Ground Water - Sanitary Discharge (GP) (GWSD)
NJG0373907	15 Baird Rd	Twp Of Millstone Brush Collection & Storage	12/31/30	Wood Waste Recycling and Leaf Composting (GP) (WRC)
NJG0378861	711 Perrineville Rd	Millstone Commons	12/31/29	Sludge Quality Category 1 (GP) (S1G)

(GP) = General Permit
(IP) = Individual Permit
(K2) = Dental Amalgam General Permit
(T1) = Sanitary Subsurface Disposal
(GWSD) = Sanitary Wastewater Discharges Less Than or Equal To 20,000 Gallons Per Day
(R9) = MS4 Tier A Municipal Stormwater General Permit
(5G2) = Basic Industrial Stormwater General Permit
(WRC) = Wood Waste Recycling and Leaf Composting Stormwater General Permit
(S1G) / (SXG)= Sludge Quality General Permits for Domestic Treatment Works

GROUNDWATER

BEDROCK AQUIFERS AND GEOLOGY

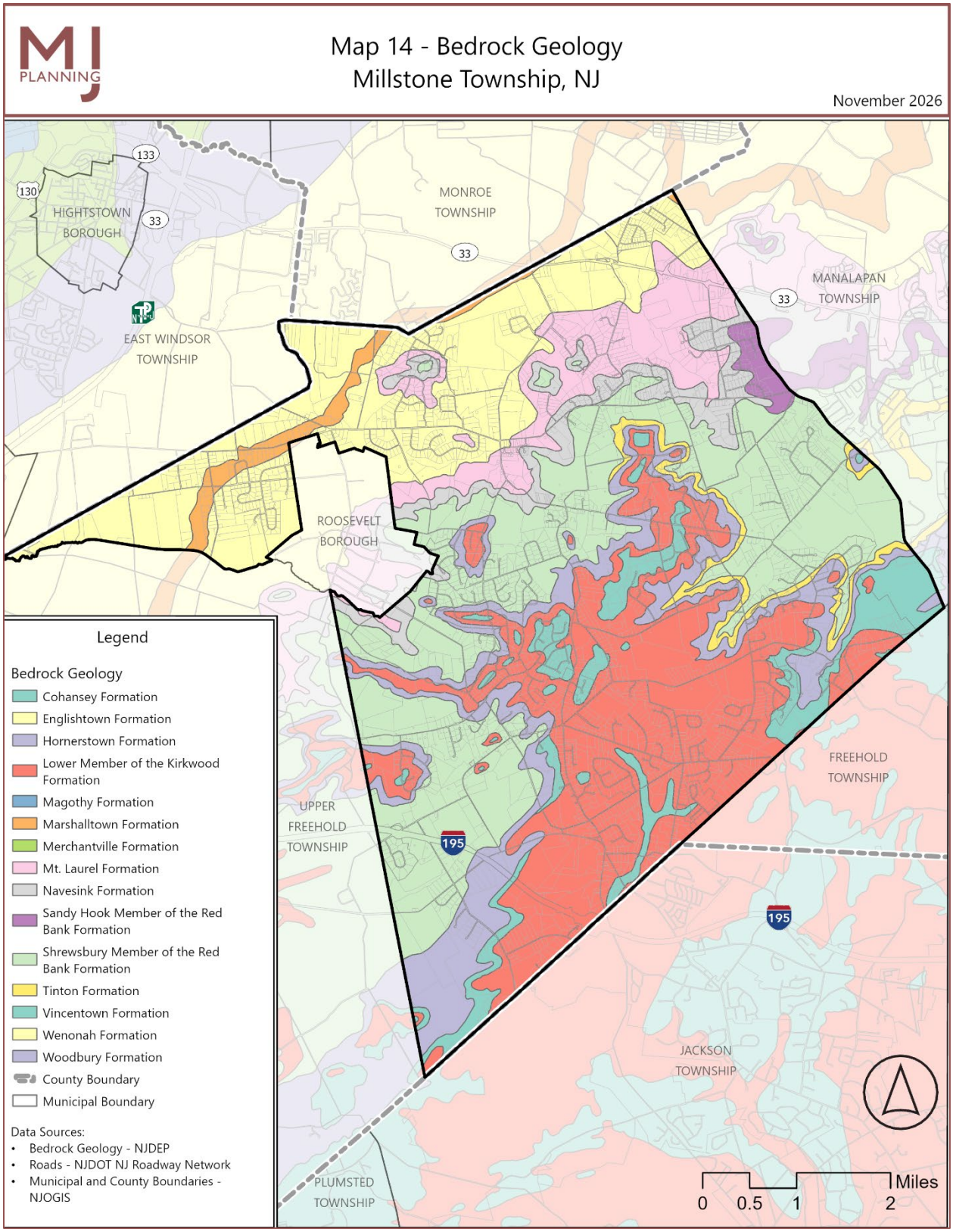
New Jersey can be divided into four unique regions with distinctive rocks and landforms. These regions are referred to as physiographic provinces. Millstone is located within the Coastal Plain, the largest of the physiographic provinces. The Coastal Plain is largely flat; however, erosion-resistant gravel or sediment underlie upland areas and isolated hills within the region.

Historically, the Coastal Plain sediments have been mined for a wide variety of materials including bog iron, glass sand, ceramic and brick clay, and titanium from sand deposits. Today, Coastal Plain sediments continue to supply glass sand and gravel construction material. The sand formations within the Plain are productive aquifers and important groundwater reservoirs.[14]

TABLE 10 – BEDROCK GEOLOGY

Bedrock Geology	Lithology	Acres	Percentage
Cohansey Formation	sand, gravel, clay, banded-iron formation	654.73	2.8%
Englishtown Formation	sand, clay	1201.47	5.0%
Hornerstown Formation	sand, clay	2448.31	10.3%
Lower Member of the Kirkwood Formation	sand, clay	5673.18	23.8%
Marshalltown Formation	sand, silt, clay	420.27	1.8%
Mt. Laurel Formation	sand, clay, gravel	1690.79	7.1%
Navesink Formation	sand, clay, silt	1038.24	4.4%
Sandy Hook Member of the Red Bank Formation	sand, clay	189.87	0.8%
Shrewsbury Member of the Red Bank Formation	sand, clay	6093.46	25.6%
Tinton Formation	sand, clay, gravel	384.29	1.6%
Vincentown Formation	sand, clay, silt, coquina, calcarenite	886.50	3.7%
Wenonah Formation	sand, clay, silt	3124.12	13.1%

[14] https://dep.nj.gov/wp-content/uploads/njgws/freedwn/bedrock2017_pag2.pdf


MJ PLANNING
Map 14 - Bedrock Geology
Millstone Township, NJ
November 2026
HIGHTSTOWN BOROUGH
EAST WINDSOR TOWNSHIP
MONROE TOWNSHIP
MANALAPAN TOWNSHIP
ROOSEVELT BOROUGH
UPPER FREEHOLD TOWNSHIP
FREEHOLD TOWNSHIP
JACKSON TOWNSHIP
PLUMSTED TOWNSHIP
133
130
33
195
Legend
Bedrock Geology
Cohansey Formation
Englishtown Formation
Hornerstown Formation
Lower Member of the Kirkwood Formation
Magothy Formation
Marshalltown Formation
Merchantville Formation
Mt. Laurel Formation
Navesink Formation
Sandy Hook Member of the Red Bank Formation
Shrewsbury Member of the Red Bank Formation
Tinton Formation
Vincentown Formation
Wenonah Formation
Woodbury Formation
County Boundary
Municipal Boundary
Data Sources:
• Bedrock Geology - NJDEP
• Roads - NJDOT NJ Roadway Network
• Municipal and County Boundaries - NJOGIS
0 0.5 1 2 Miles

Aquifers are underground layers of solid rock that store groundwater between fractures and cracks. Aquifers, therefore, can have major implications for groundwater use. In New Jersey, the principal aquifers are classified two groups-Coastal Plain aquifers south of the Fall Line and non-Coastal Plain aquifers north of the Fall Line.

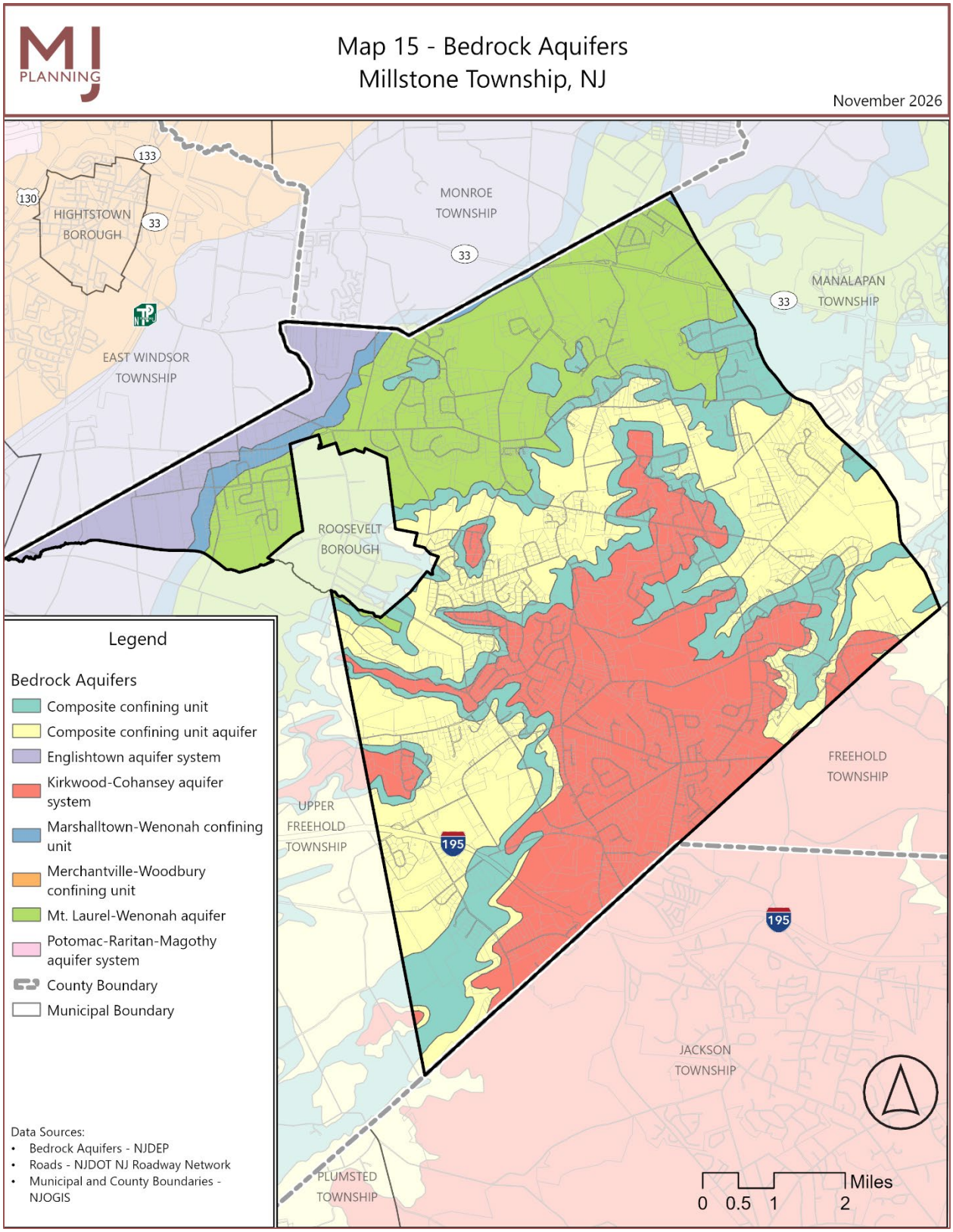
All aquifers in Millstone are within the Coastal Plain. The Coastal Plain is characterized by unconsolidated sand, gravel, silt, and clay. The highly permeable beds of coarse material form aquifers of varying thickness and extent. The aquifers are recharged by precipitation, vertical leakage through confining beds, and by seepage from surface water. More than 75% of the freshwater supply in the New Jersey Coastal Plain is from groundwater[15]

The principal Coastal Plain aquifers that are within Millstone are the Kirkwood-Cohansey aquifer system and the Englishtown aquifer system. Other aquifers include the Marshalltown-Wenonah confining unit, the Composite confining unit and aquifer, and the Mt. Laurel-Wenonah aquifer.

TABLE 11 - BEDROCK AQUIFERS

Bedrock Aquifers	Rank	Acreage	Percentage
Englishtown aquifer system	B	1200.03	5.04%
Marshalltown-Wenonah confining unit	E	419.36	1.76%
Composite confining unit	E-D	4087.37	17.17%
Kirkwood-Cohansey aquifer system	B-A	6257.43	26.29%
Composite confining unit aquifer	C-B	7018.67	29.48%
Mt. Laurel-Wenonah aquifer	C	4821.57	20.25%

[15] https://www.usgs.gov/centers/new-jersey-water-science-center/major-aquifers-new-jersey


MJ PLANNING
Map 15 - Bedrock Aquifers
Millstone Township, NJ
November 2026
HIGHTSTOWN BOROUGH
MONROE TOWNSHIP
MANALAPAN TOWNSHIP
EAST WINDSOR TOWNSHIP
ROOSEVELT BOROUGH
UPPER FREEHOLD TOWNSHIP
FREEHOLD TOWNSHIP
JACKSON TOWNSHIP
PLUMSTED TOWNSHIP
133
130
33
195
Legend
Bedrock Aquifers
Composite confining unit
Composite confining unit aquifer
Englishtown aquifer system
Kirkwood-Cohansey aquifer system
Marshalltown-Wenonah confining unit
Merchantville-Woodbury confining unit
Mt. Laurel-Wenonah aquifer
Potomac-Raritan-Magothy aquifer system
County Boundary
Municipal Boundary
Data Sources:
Bedrock Aquifers - NJDEP
Roads - NJDOT NJ Roadway Network
Municipal and County Boundaries - NJOGIS
0 0.5 1 2 Miles

GROUNDWATER RECHARGE POTENTIAL[16]

According to NJDEP, groundwater recharge is defined as rainwater that has infiltrated into the soil and has not evaporated. The infiltrated water instead moves downward to a depth below the root zone of the surface vegetation, where it cannot be removed and is considered available to enter the soil's saturated zone and become groundwater. Groundwater supplies water to wells, and provides base flow to streams, wetlands, and other water bodies.

Groundwater recharge is estimated using New Jersey Geological Survey methodology. Land-use/land-cover, soil and climatic data are combined to produce an estimate of ground-water recharge in inches per year. The NJDEP ranks areas with similar groundwater recharge potential throughout the state.

Within Millstone, the most prevalent recharge rate is 11 to 15 inches per year, found in nearly two thirds of the municipality. Over a quarter of Millstone has a recharge rate of zero or no recharge calculated. These areas include wetlands, surface waters, and hydric soils formed under conditions of saturation.

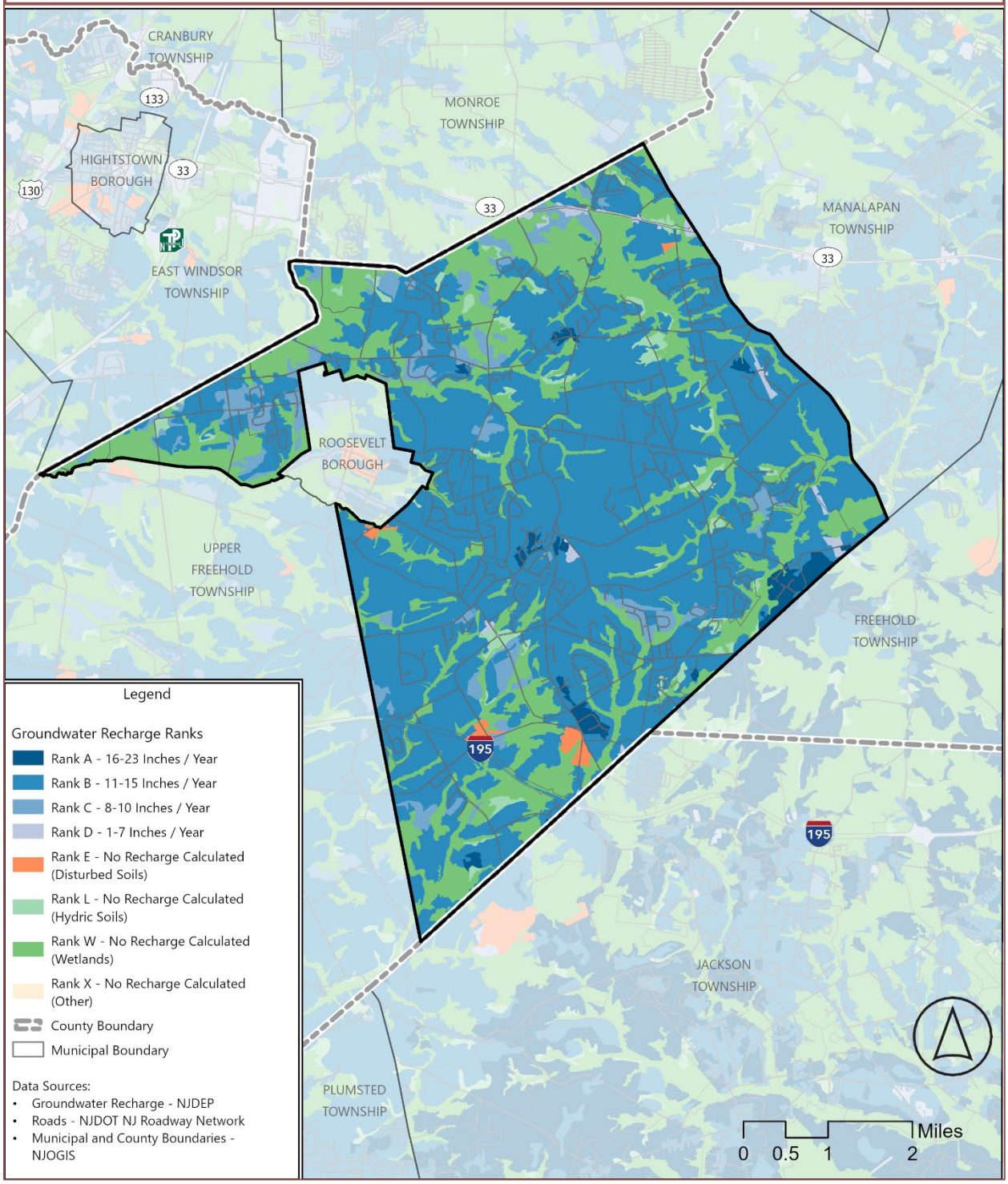
TABLE 12 - GROUNDWATER RECHARGE POTENTIAL

Rank	Recharge Rate (inches per year)	Acreage	Percentage
Rank A	16 to 23 in/yr	377.88	2%
Rank B	11 to 15 in/yr	15113.43	65%
Rank C	8 to 10 in/yr	1260.24	5%
Rank D	1 to 7 in/yr	164.92	1%
Rank E	0 in/yr	128.11	1%
Rank L	hydric soil-no recharge calculated	479.57	2%
Rank W	wetlands, open water-no recharge calculated	5837.96	25%

[16] https://dep.nj.gov/njgws/educational/educational-publications-and-information/aquifer-recharge/

Map 16 - Groundwater Recharge Potential
Millstone Township, NJ

November 2026



DRINKING WATER SUPPLY

Within Millstone there is no public water infrastructure. The following chart details the 88 water systems as inventoried by the NJDEP. Of these water systems, 21 are inactive (I), and the remaining 67 are active (A). All of the water systems are sourced from ground water (GW). Water system types include non-public (NP), non-transient non-community (NTNC), non-community (NC), and community (C).

TABLE 13 - DRINKING WATER SUPPLY

Water System ID	Water System Name	Status	Water System Type	Primary Water Source Type	Population Served	Service Connections
NJ1332326	Millstone Professional Plaza	A	NC	GW	54	1
NJ1332328	Country Store & Deli Too	A	NC	GW	306	1
NJ1332329	Gedi Corporate Plaza	A	NTNC	GW	70	2
NJ1332334	Millstone Twp Fire Co	A	NC	GW	30	1
NJ1332339	The Chozas Restaurant	A	NC	GW	110	2
NJ1332340	Albivi Brick Oven	A	NC	GW	103	2
NJ1332341	Harter Equipment	A	NC	GW	58	1
NJ1332342	Showplace Farms	A	NTNC	GW	60	6
NJ1332343	Vesuvios Pizza Well No 1	A	NC	GW	63	1
NJ1332344	Millstone Municipal Office	A	NC	GW	57	1
NJ1332345	Liberty Insurance Associates	A	NC	GW	35	1
NJ1332350	Tommys Inn At Millstone	A	NC	GW	104	1
NJ1332351	Millstone Center	A	NC	GW	90	1
NJ1332352	Millstone Twp Primary School	A	NTNC	GW	650	2
NJ1332354	Wawa #909	A	NTNC	GW	2995	1
NJ1332356	Remmingtons	A	NC	GW	161	1
NJ1332357	Burger King #13470	A	NC	GW	848	1
NJ1332358	Charleston Springs Golf Course	A	NC	GW	465	1
NJ1332361	Kentucky Fried Chicken	A	NC	GW	311	1
NJ1332362	Dairy Queen	A	NC	GW	181	1
NJ1332363	Dugans Corner Center	A	NTNC	GW	228	1
NJ1332365	St. Josephs Church	A	NC	GW	802	1
NJ1332366	Citgo Mart & Deli	A	NC	GW	28	1
NJ1332368	Xtreme Machines	A	NC	GW	271	1
NJ1332369	Black Bear Lake Day Camp #1	A	NP	GW	700	1
NJ1332372	Remmington Plaza Unit 2	A	NC	GW	235	1
NJ1332370	Black Bear Lake Day Camp #2	A	NC	GW	700	1
NJ1332373	Hunter Jersey Peterbilt	A	NTNC	GW	80	1
NJ1332375	Heilbrum Pape LLC	A	NC	GW	34	1
NJ1332376	Roys Deli	A	NC	GW	51	1
NJ1332377	Frog Bridge Day Camp & Tadpole Village P	A	NC	GW	618	1
NJ1332379	Wagner Farm Park	A	NC	GW	57	1
NJ1332380	Monroe Adult Daycare	A	NTNC	GW	35	1
NJ1332381	Forrest Hills Building B	A	NTNC	GW	180	1

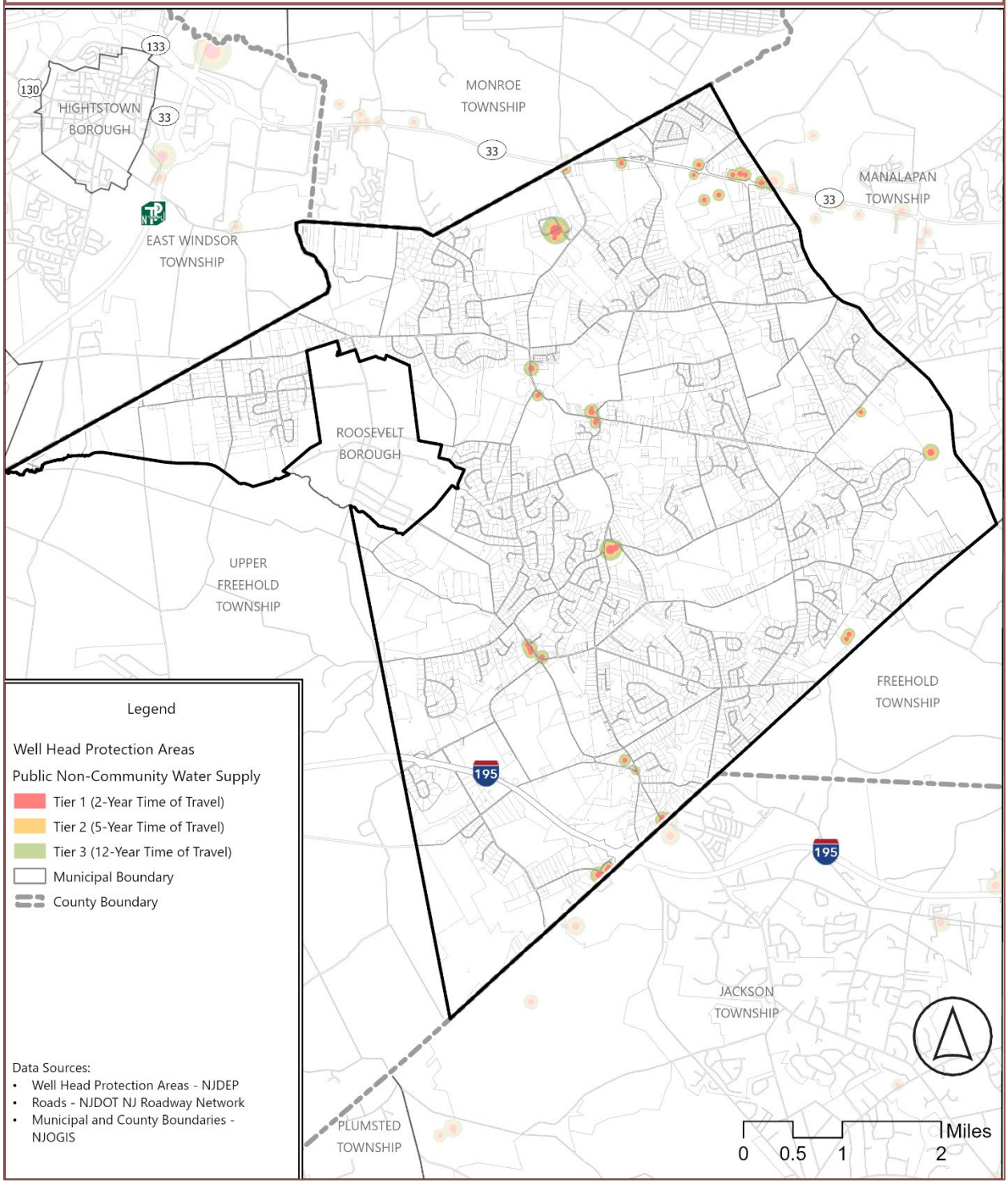
NJ1332384	Millstone Twp Middle School	A	NTNC	GW	850	1
NJ1332386	Millstone Roosevelt Little League	A	NC	GW	102	1
NJ1332387	Olivia's	A	NC	GW	105	1
NJ1332389	Green Leaf Pet Resort	A	NC	GW	118	1
NJ1332390	Shady Rest Home	A	NC	GW	31	2
NJ1332391	Black Bear Day Camp Well 3	A	NC	GW	700	1
NJ1332392	Roy's Deli & Market	A	NC	GW	90	1
NJ1332393	Millstone River Mart	A	NTNC	GW	375	1
NJ1332327	Silvi Lj/Silvi Concrete	I	NP	GW	0	1
NJ1332330	Ilham Alqaisim Obstetric	I	NP	GW	0	1
NJ1332331	Amoco Service Station #60759	I	NC	GW	25	10
NJ1332333	Mesce Ralph	I	NP	GW	0	0
NJ1332336	Millstone Christian Pre	I	NP	GW	0	2
NJ1332337	Cree-Mee Freeze	I	NP	GW	0	1
NJ1332347	Showplace Farms LLC (Office Well#1)	I	NC	GW	67	2
NJ1332348	Millstone Country Store	I	NP	GW	0	1
NJ1332349	Farm House Kids Day Care	I	NP	GW	0	1
NJ1332355	Kindercare Learning Center #301559	I	NTNC	GW	95	1
NJ1332359	Charleston Springs Golf Course	I	NC	GW	31	15
NJ1332360	Hole In One Golf Center	I	NC	GW	154	1
NJ1332364	Sunrise Grocery & Deli	I	NC	GW	102	1
NJ1332367	Crest Engineering, Inc.	I	NTNC	GW	62	1
NJ1332374	Forest Hills Building A	I	NTNC	GW	78	1
NJ1332378	Hytek Corp Center	I	NTNC	GW	27	1
NJ1332382	VSDS	I	NTNC	GW	130	1
NJ1336383	Camp Topaneums Splash Park	I	NC	GW	604	2
NJ1332383	Camp Topanemus Splash Park	I	NC	GW	604	2
NJ1332385	Dunkin Donuts	I	NC	GW	404	1
NJ1332388	Millstone Community Center	I	NC	GW	100	1

WELLHEAD PROTECTION AREAS

A Wellhead Protection Area is a mapped boundary delineated by the NJDEP around a public drinking water supply well to protect drinking water from groundwater contamination. A Wellhead Protection Area is the horizontal extent from which a well draws groundwater within a specified time frame. Each Wellhead Protection Area is comprised of three tiers corresponding to the time that it takes groundwater to travel to an active well. Tier 1 has a travel time of two years, Tier 2 has a five-year travel time, and Tier 3 has a twelve-year travel time. The tiers aid local governments to identify, monitor, and regulate potential contamination sources. See Map 17 for Wellhead Protection Areas in Millstone.

Map 17 - Well Head Protection Areas
Millstone Township, NJ

November 2026



GROUNDWATER CONTAMINATION[17]

The NJDEP requires parties responsible for the contamination and/or remediation of groundwater to provide documentation and monitoring of groundwater contamination via a Classification Exception Area (CEA). A Classification Exception Area (CEA) is a regulatory control that designates and monitors areas where groundwater pollution exceeds quality standards. Active CEA designation notifies local residents and officials of the contamination and often regulates or restricts use of the area via a Well Restriction Area (WRA) until remediated.

Details of a CEA, such as the types of pollutants, duration of impact, and geographic extent of contamination, are typically contained in an NJDEP issued CEA Fact Sheet. The following table documents the CEA's within Millstone. More information on each CEA can be found at DEP DataMiner.

TABLE 14 - CLASSIFICATION EXCEPTION AREAS IN MILLSTONE

Site ID	Site Name	Address	Block/Lot	Program	Depth (ft.)	Duration (years)	Active Remediation	WRA	Acres
4308	Raceway Station	454 Rout 33 W & Iron Ore Rd	22/15 24/5	LSRP	30	Indeterminate	No	Yes	1.31
29197	Clarksburg Amoco	504-506 Monmouth Rd	59/10; 11; 13.01; 13.02; 14.01	RAP	50	10.5	No	Yes	5.78
46637	Mustang Gas & Oil Inc	Route 537 & Route 571	59/10; 11; 13.01; 13.02; 14.01; 6.02 60.01/19.01; 20.01	LSRP	75	Indeterminate	No	Yes	13.4

BIOLOGICAL RESOURCES

Biological resources in Millstone consist of plant and animal species and the habitats that support them. The natural, undeveloped portions of the Township provide a range of habitats in uplands and wetlands that support a variety of plant and animal species, including some that are threatened and endangered. The maintenance of undisturbed and undeveloped natural areas in the Township promotes Millstone's biodiversity and supports cycles of nutrition and decomposition, soil rehabilitation, surface and groundwater filtration, pollination, and other natural functions.

Continued protection, enhancement, and restoration of natural areas in the Township is central to the Township's planning goals and is consistent with the New Jersey State Development and Redevelopment Plan as the Township is considered a Rural Environmentally Sensitive (PA4B) Planning Area.

NATURAL LAND COVER

The Land Use and Land Coverage section, above, includes further details regarding the natural land cover within the Township. Additionally, the 2006 Millstone Township Natural Resource Inventory includes a detailed inventory of plant species found within the Township.

[17] https://gisdata-njdep.opendata.arcgis.com/datasets/njdep::classification-exception-areas-well-restriction-areas-for-new-jersey/about

Forest

Land classified as forest has a tree cover of at least ten percent. Land that has been cleared to below that threshold but has not been otherwise developed can also be classified as forest land. A total of 6,344.5 acres are classified as forest, totaling 26.7% of Millstone's land coverage.

Agriculture

Agricultural land is defined as land used primarily for production of food and fiber. Approximately 4,793 acres, or twenty percent of the land in Millstone is classified as agricultural.

Wetlands

Wetlands are areas that are wet for at least a portion of the year and are characterized by aquatic or hydrophytic vegetation. Wetlands can include marshes, swamps, bogs, and are generally low points in the topography of an area. Within Millstone, approximately 4,990 acres are classified as wetlands, accounting for 21% of the Township's land coverage.

NJ LANDSCAPE PROJECT

The New Jersey Landscape Project is a planning and screening tool used to identify areas that are potentially critical to important plant and animal habitats throughout the state. The data set and report are based on land use / land cover data, which is derived from processing aerial imagery to identify characteristics associated with different natural features and land use, documented species location, and data about the life cycles and histories of species. The result is a mapping tool and accompanying report that identify threatened and endangered species, areas where they may be likely to occur, and detailed information about the type and timing of the occurrence. The most current version of the Landscape Project, Version 3.4, was prepared in 2025 based on the 2020 land use / land cover data and species data from the 2023 Biotics database.

The Landscape Project is a statewide tool meant to support the protection of threatened and endangered species and their habitats, and to promote restoration and future conservation in the face of development pressures. Mapping produced using the Landscape Project data provides an initial screening that requires field review and verification for site-specific permitting and development purposes. It is a useful initial screen for municipal-scale, regional, and long-range planning efforts. The areas identified as potential habitat often overlap with other environmentally sensitive features and reinforce the interconnected relationships between natural systems.

New Jersey is divided into six landscape regions, which includes the marine region that encompasses portions of the Delaware and Raritan bays and the coastal portion of the Atlantic Ocean within the state's jurisdiction. Millstone is located in the Piedmont Plains Landscape just north of the Pinelands Landscape. Per the Landscape Project Report, the Piedmont Plains Landscape is "characterized by farmed areas, extensive grasslands, fragmented woodlands and productive tidal marshes."[18]

Habitats are ranked from 1 (least critical) to 5 (most critical) as follows:

[18] New Jersey DEP Fish and Wildlife. 2025. New Jersey Landscape Project, Version 3.4. New Jersey Department of Environmental Protection, Fish and Wildlife.
https://dep.nj.gov/wp-content/uploads/njfw/landscape-project-report-version-3.4.pdf

1. Species-specific habitat patches that meet habitat-specific suitability requirements such as minimum size or core area criteria for endangered, threatened or special concern wildlife species, but do not intersect with any confirmed occurrences of such species.
2. Species-specific habitat patches containing one or more occurrences of species considered to be of special concern.
3. Species-specific patches containing one or more occurrences of State threatened species.
4. Species-specific habitat patches with one or more occurrences of State endangered species.
5. Species-specific habitat patches containing one or more occurrences of wildlife listed as endangered and threatened pursuant to the Federal Endangered Species Act of 1973.

In addition to the habitat rankings, the data includes an identification of freshwater streams that provide critical habitat to freshwater fish and mussel species. None of the waterways in Millstone are identified as potentially critical freshwater habitat.

The data also identified vernal pools and surrounding habitat areas. The Freshwater Wetland Protection Act Rules at N.J.A.C. 7:7A-1.3 defines "Vernal Habitat" as "a wetland as identified at N.J.A.C. 7:7A-3.1, or State open water, as defined above in this section that meets all of the criteria at 1 through 4 below. Evidence of breeding by an obligate species under 2i below creates a rebuttable presumption that the criteria at 3 and 4 below are met:

Definitions

Endangered Species - A species included on the list of endangered species at N.J.A.C. 7:25-4.13 and any species or subspecies of wildlife appearing on any Federal endangered species list. The Endangered and Nongame Species Conservation Act (N.J.S.A. 23:2A et seq.) defines an endangered species (with respect to wildlife) to be a species or subspecies of wildlife whose prospects for survival or recruitment are in jeopardy or are likely within the foreseeable future to become so due to any of the following factors: (1) the destruction, drastic modification, or severe curtailment of its habitat, or (2) its over-utilization for scientific, commercial or sporting purposes, or (3) the effect on it of disease, pollution, or predation, or (4) other natural or manmade factors affecting its prospects of survival or recruitment within the State, or (5) any combination of the foregoing factors. The term shall also be deemed to include any species or subspecies of wildlife appearing on any Federal endangered species list.

Threatened Species - An indigenous nongame wildlife species of New Jersey designated pursuant to the Endangered and Nongame Species Conservation Act, N.J.S.A.23:2A et. seq., and its implementing rules, N.J.A.C. 7:25- 4.17, as most recently amended. Threatened species are generally defined to be species that may become endangered if conditions surrounding them begin or continue to deteriorate.

Species of Special Concern - Nongame wildlife species that warrants special attention by the Department because of inherent vulnerability to environmental deterioration or habitat modification that would result in its becoming threatened if conditions surrounding the species begin or continue to deteriorate. Factors that can lead to classification as special concern include, but are not limited to, species rarity in the State, highly specialized food and/or habitat requirements, low reproductive rate, isolated populations of the species within the State and/or other characteristics that make the species particularly susceptible to environmental or habitat changes. This category includes a species that meets the foregoing criteria and for which there is little understanding of its current population status in the State. Species determined to be "special concern" are so-designated at N.J.A.C. 7:25-4.17.

1. Occurs in or contains a confined basin depression without a permanent flowing outlet;
2. Features evidence of breeding by one or more species of fauna adapted to reproduce in ephemeral aquatic conditions, identified in N.J.A.C. 7:7A, Appendix 1, incorporated herein by reference. The following shall constitute evidence of breeding by such a species:
   i. One or more obligate species listed in Appendix 1, or evidence of such a species, is found in or immediately adjacent to the area of ponded water; or
   ii. Two or more facultative species listed in Appendix 1, or evidence of the presence of such a species, are found in or immediately adjacent to the area of ponded water;
3. Maintains ponded water for at least two continuous months between March and September of a normal rainfall year; and
4. Is free of reproducing fish populations throughout the year or dries up at some time during a normal rainfall year."

TABLE 15 - LANDSCAPE PROJECT V.3.4 HABITAT TYPES

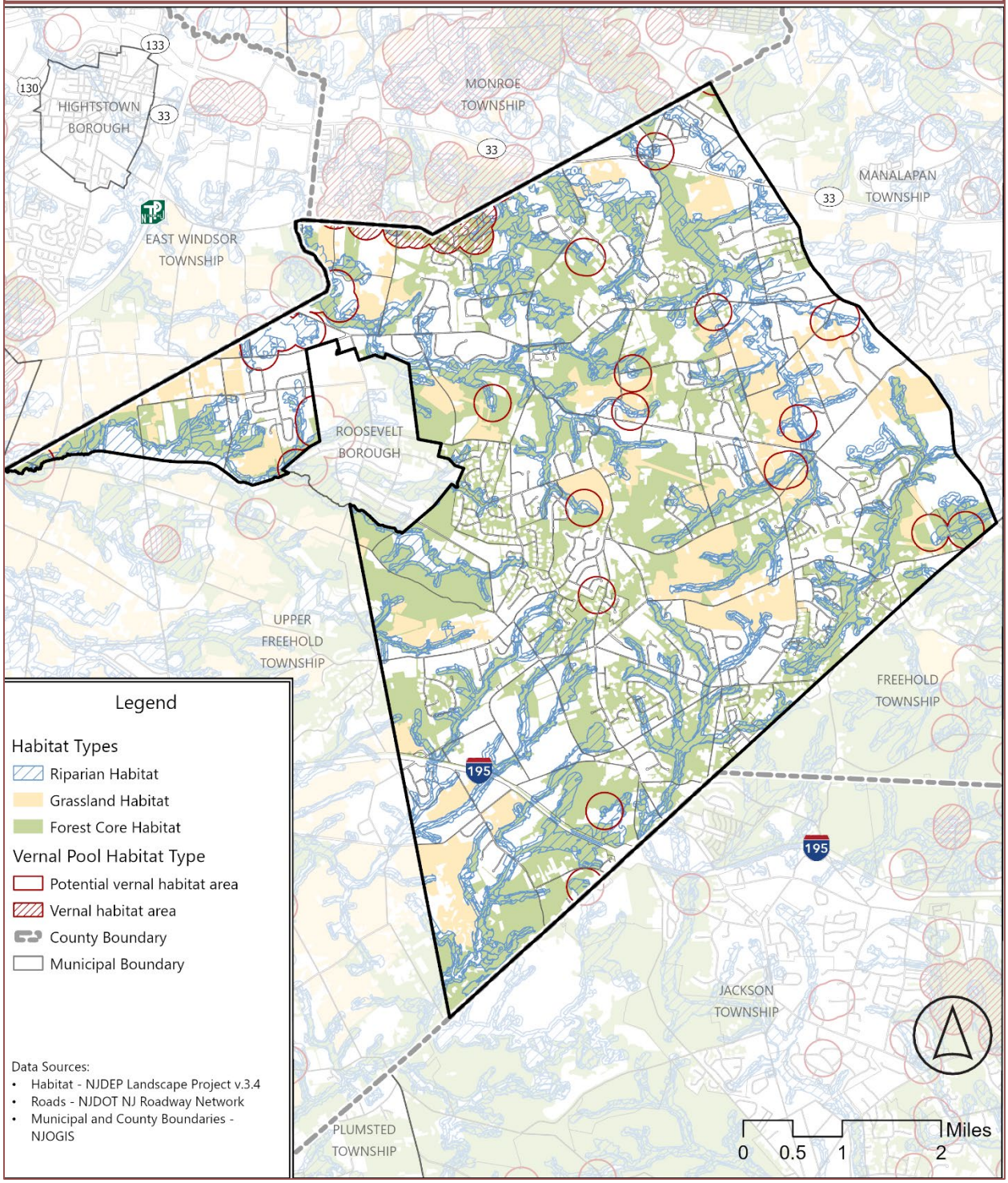
Habitats	Acreage	Pct
Riparian Corridors*	5990.7	25.2%
Core Forest (10 Hectares+)	9066.0	38.1%
Grassland (18 Hectares+)	2808.6	11.8%
No Habitat Identified	5939.3	25.0%
*Riparian Corridors may overlap other habitat types		

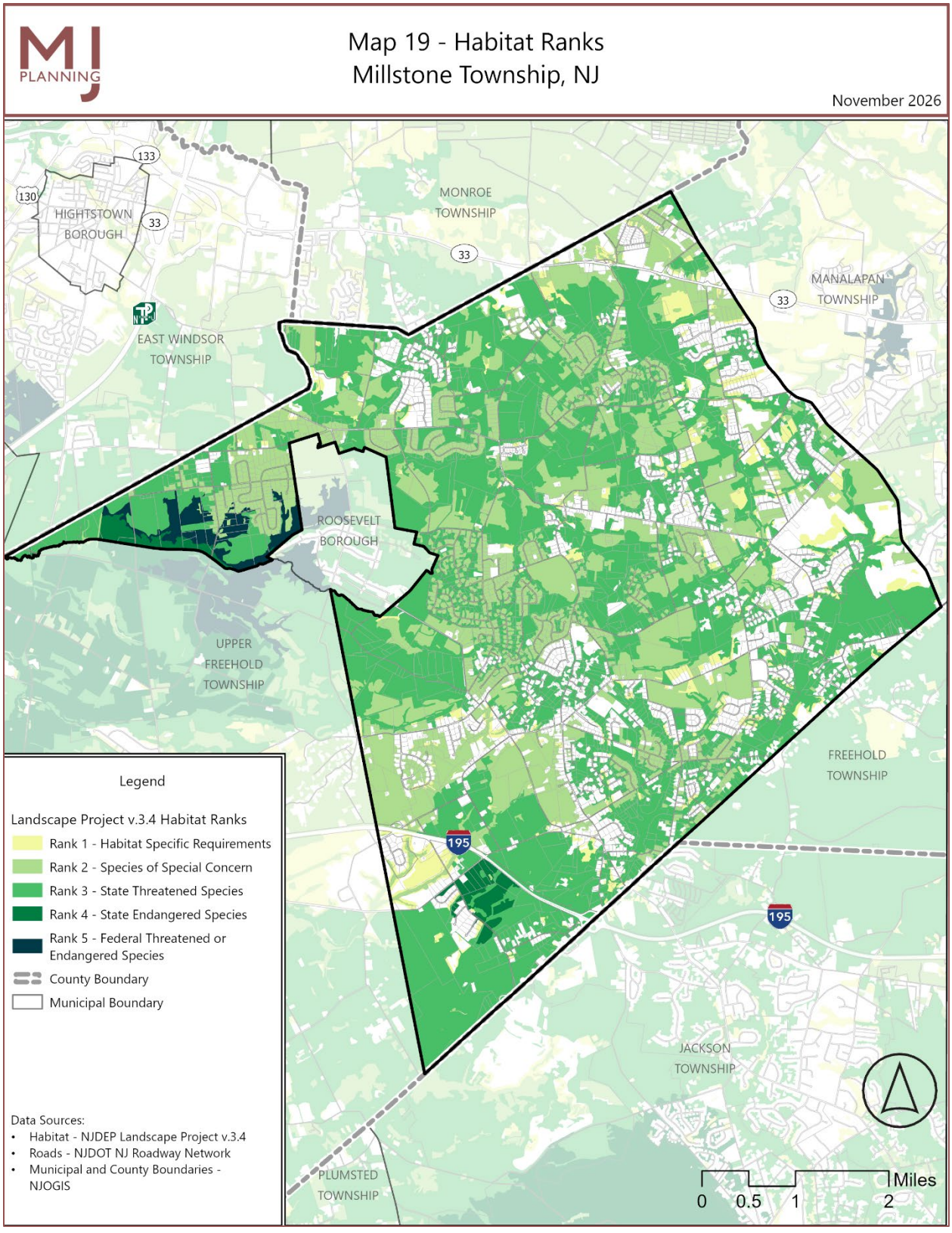
TABLE 16 - LANDSCAPE PROJECT V.3.4 HABITAT RANK

Habitat Rank	Acreage	Pct
1 - Habitat Specific Requirements	884.4	3.7%
2 - Species of Special Concern	6540.4	27.5%
3 - State Threatened Species	10960.4	46.0%
4 - State Endangered Species	297.9	1.3%
5 - Federal Threatened or Endangered Species	279.3	1.2%
No Habitat Identified	4842.1	20.3%

Map 18 - Habitat Areas
Millstone Township, NJ

November 2026




MJ PLANNING
Map 19 - Habitat Ranks
Millstone Township, NJ
November 2026
HIGHTSTOWN BOROUGH
MONROE TOWNSHIP
EAST WINDSOR TOWNSHIP
MANALAPAN TOWNSHIP
ROOSEVELT BOROUGH
UPPER FREEHOLD TOWNSHIP
FREEHOLD TOWNSHIP
JACKSON TOWNSHIP
PLUMSTED TOWNSHIP
133
130
33
195
Legend
Landscape Project v.3.4 Habitat Ranks
Rank 1 - Habitat Specific Requirements
Rank 2 - Species of Special Concern
Rank 3 - State Threatened Species
Rank 4 - State Endangered Species
Rank 5 - Federal Threatened or Endangered Species
County Boundary
Municipal Boundary
Data Sources:
• Habitat - NJDEP Landscape Project v.3.4
• Roads - NJDOT NJ Roadway Network
• Municipal and County Boundaries - NJOGIS
0 0.5 1 2 Miles

PLANT AND ANIMAL COMMUNITIES

Table 17 shows the Threatened and Endangered species that have been seen in Millstone Township along with the type of habitat or sighting, the New Jersey Rank, New Jersey Status, and year when the species was last observed. The most recently observed species are the Bobcat, Bald Eagle, Silver-haired bat, Bog Turtle, and Wood Thrush.

TABLE 17 - THREATENED AND ENDANGERED SPECIES

Common Name	Scientific Name	Type of Habitat / Sighting	NJ Rank	NJ Status	Last Observed
Amphibians					
New Jersey Chorus Frog	Pseudacris kalmi	Breeding Sighting	2	SC	2005
Pine Barrens Treefrog	Dryophytes andersonii	Vernal Pool Breeding	3	SC	1998
Birds					
Bald Eagle	Haliaeetus leucocephalus	Foraging	2	SC	2022
Black-throated Green Warbler	Setophaga virens	Breeding Sighting	2	SC	2002
Brown Thrasher	Toxostoma rufum	Breeding Sighting	2	SC	2008
Chimney Swift	Chaetura pelagica	Breeding Sighting	2	SC	2005
Field Sparrow	Spizella pusilla	Breeding Sighting	2	SC	2005
Great Blue Heron	Ardea herodias	Foraging	2	SC	2013
Wood Thrush	Hylocichla mustelina	Breeding Sighting	2	SC	2018
American Kestrel	Falco sparverius	Breeding Sighting	3	T	1998
Barred Owl	Strix varia	Non-breeding Sighting	3	T	1997
Bobolink	Dolichonyx oryzivorus	Breeding Sighting	3	T	2006
Eastern Meadowlark	Sturnella magna	Breeding Sighting	3	T	2004
Grasshopper Sparrow	Ammodramus savannarum	Breeding Sighting	3	T	1999
Savannah Sparrow	Passerculus sandwichensis	Breeding Sighting	3	T	1988
Vesper Sparrow	Pooecetes gramineus	Breeding Sighting	4	E	1984
Insects					
Frosted Elfin	Callophrys irus	Casual Flyby	3	T	2001
Mammals					
Big Brown Bat	Eptesicus fuscus	Maternity Colony	2	SC	2012
Silver-haired Bat	Lasionycteris noctivagans	Inactive Season Sighting	2	SC	2021
Bobcat	Lynx rufus	Live Individual Sighting	3	T	2022
Reptiles					
Northern Pinesnake	Pituophis melanoleucus melanoleucus	Occupied Habitat	3	T	2000
Wood Turtle	Glyptemys insculpta	Occupied Habitat	3	T	2001
Bog Turtle	Glyptemys muhlenbergii	Occupied Habitat	5	E + FT	2018
E = Endangered; T = Threatened; FT = Federally Threatened; SC = Special Concern					

NJ CONSERVATION BLUEPRINT[19]

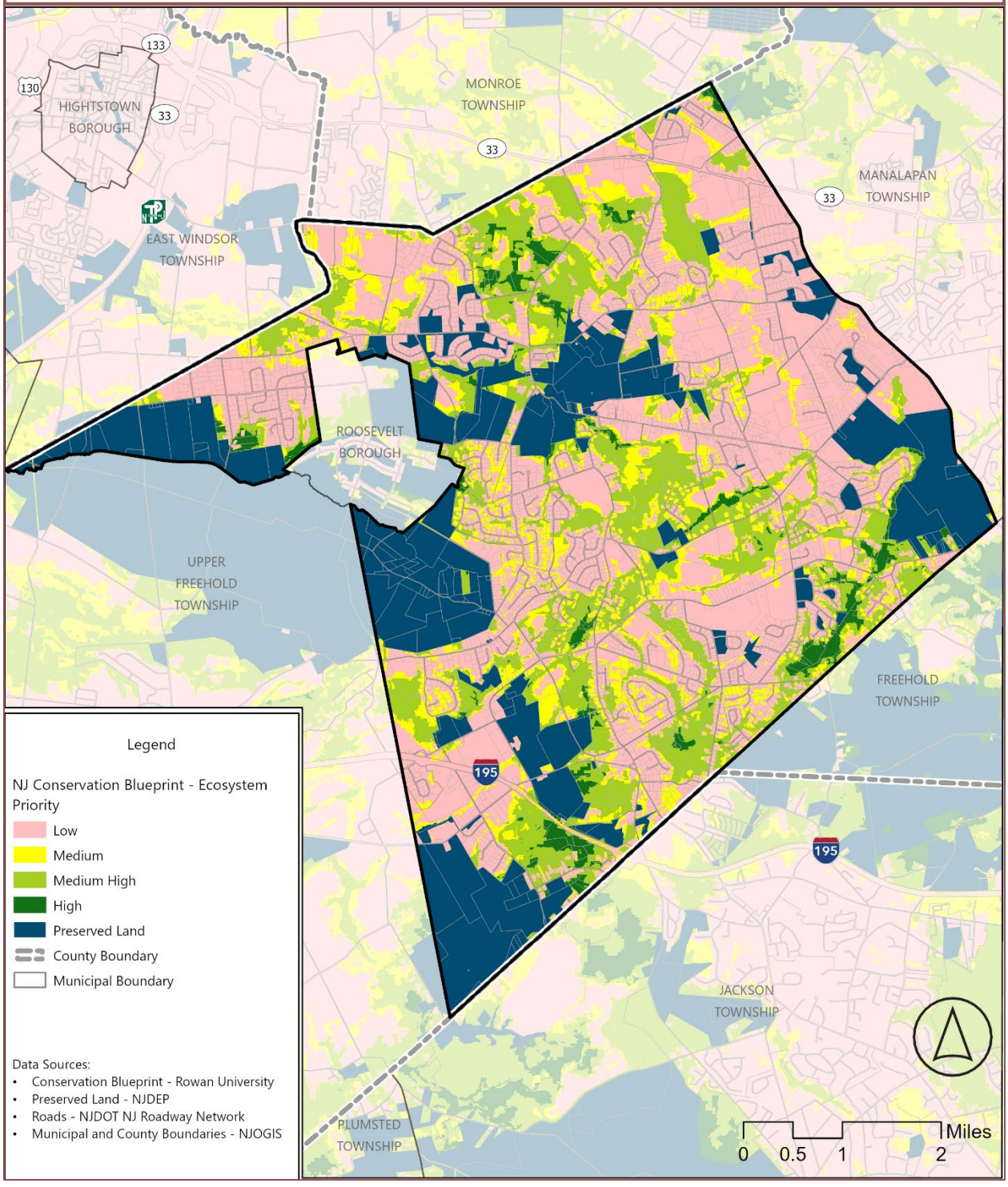
The NJ Conservation Blueprint is a data-driven, interactive mapping tool provided by a partnership of governmental and nongovernmental agencies and organizations to identify ecosystems and critical areas for preservation.

The Conservation Blueprint's Ecosystem Priority Model identifies lands that are critical to protect to maintain New Jersey ecosystems. The mapping system assigns point values based on water quality, rare species habitats, climate change resiliency, and habitat connectivity. Scores are then classified into one of five ranks to further illustrate the ecological resource value. Map 20 shows the location of lands preserved as existing parks, open space, and farmland in Millstone along with the relative priority areas for future preservation based on the Conservation Blueprint's Ecosystem Priority Model.

[19] https://www.nj-map.com/blueprint/

Map 20 - NJ Conservation Blueprint Ecosystem Priority
Millstone Township, NJ

November 2026



BUILT ENVIRONMENT

LAND USE (MODIV)

The built environment includes the man-made or modified structures that provide people with living, working, and recreational spaces. The built environment directly affects the use of natural resources. Land use describes the human use of land, representing the activities (e.g., agricultural, residential, industrial, mining, and recreational uses) that are practiced at a given place.[20]

Land development creates impervious surfaces through construction of roads, parking lots, and other structures. Impervious surfaces contribute to water pollution, affect water quality, increase storm water runoff, which can deliver more pollutants to water, and affect ground water aquifer recharge. Agricultural land uses can affect the quality of water and watersheds, including water availability and quality.

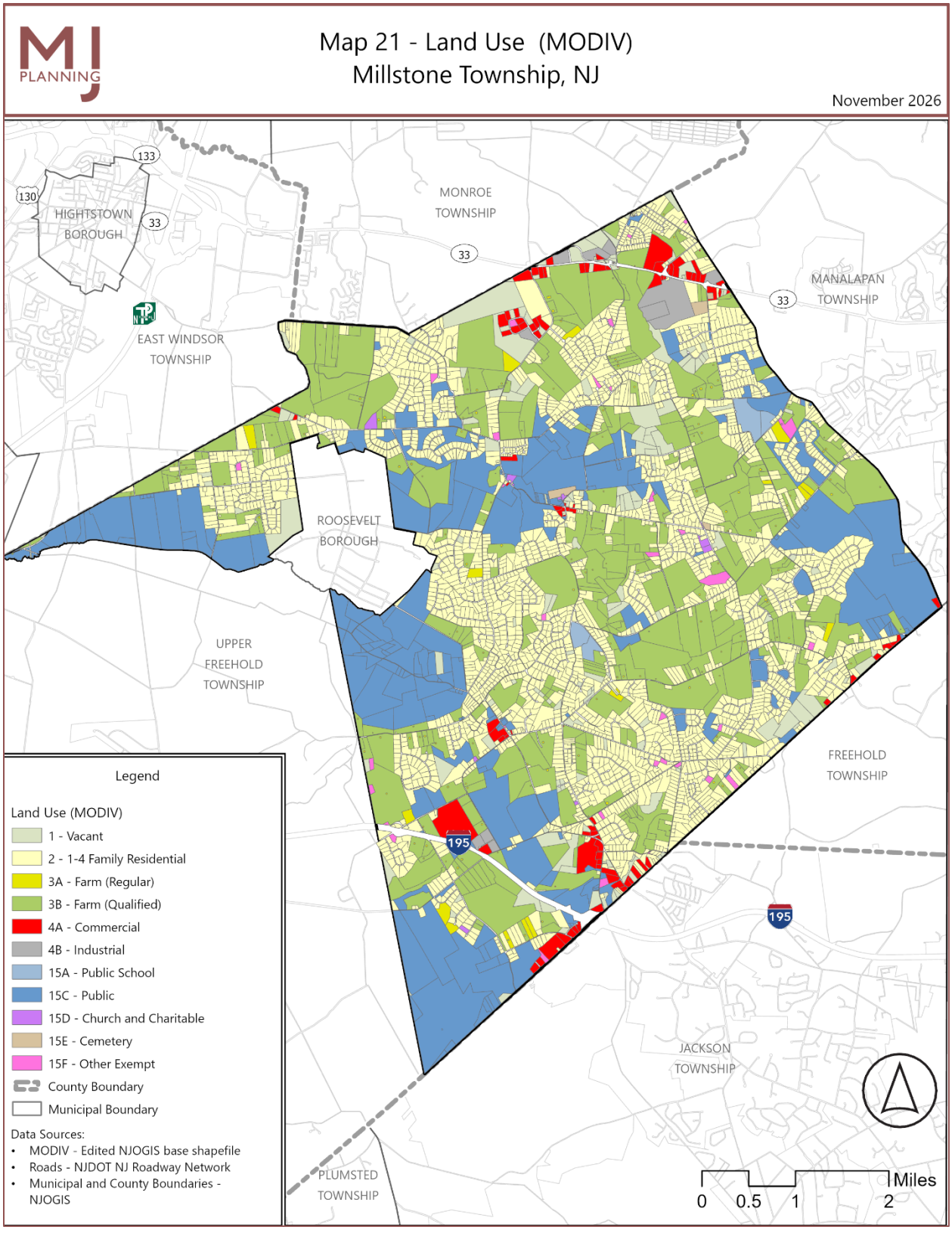
According to MOD IV, New Jersey's property tax assessment and record system, 34% of Millstone's total area is residential in use. An additional 2% is dedicated to commercial and industrial uses, and approximately 30% of land in the Township is dedicated to farm use. Class 3A property includes agricultural land not qualified under the Farmland Assessment Act, plus farmhouses and related improvements. Class 3B property includes land actively devoted to agricultural or horticultural use that qualifies under the Farmland Assessment Act.

Public land includes municipal, county, state, and federal public property. In Millstone, nearly half of public land is under the ownership of the State and the NJDEP. An additional 34% is owned by Monmouth County, which includes the County owned parks within the Township, which are discussed further in the Parks, Trails & Recreation Facilities section. The table below includes the complete breakdown of land use within Millstone.

TABLE 18 - LAND USE (MODIV)

Property Class	Land Use	Acreage	% of Area
1	Vacant	1,222.1	5.4%
2	Residential (1-4 Units)	7829	34.3%
3A	Farm (Regular)	175.1	0.8%
3B	Farm (Qualified)	6,937.6	30.4%
4A	Commercial	494.4	2.2%
4B	Industrial	226.1	1.0%
15A	Public School	118.1	0.5%
15C	Public	5,629.1	24.7%
15D	Church and Charitable	32.1	0.1%
15E	Cemetery	33.9	0.1%
15F	Other Exempt	108.8	0.5%

[20] https://www.epa.gov/report-environment/land-use



HOUSING DENSITY

As of 2024, Millstone has a population of 10,385 individuals. The Township, which measures 37.18 square miles, has a population density of approximately 279 people per square mile. According to recent American Community Survey data, Millstone has an estimated 3,352 occupied housing units within the Township. Of those units, 99% are single-family detached homes. The remaining one percent includes single-family attached dwellings and three to four-family apartments.

Housing density measures the number of dwelling units per unit of land area. Housing density plays a significant role in environmental health, energy usage, water usage, and land preservation. Millstone has a notably low housing density. As discussed above, the Township has primarily single-family homes and large amounts of farmland and open space. The preservation of these natural resources provides areas of low impervious coverage, which may allow for increased natural aquifer recharge and additional environmental benefits.

TABLE 19 – OCCUPIED HOUSING UNITS BY BUILDING TYPE

Building Type	Units (2024)	Percentage
1, detached	3,330	99.3%
1, attached	9	0.3%
2 apartments	0	0.0%
3 or 4 apartments	13	0.4%
5 to 9 apartments	0	0.0%
10 or more apartments	0	0.0%
Mobile home or other type of housing	0	0.0%
Total	**3,352**	-

TRANSPORTATION

Several county roads travel through Millstone, including County Routes 1, 524, 526, 527, and 571. State highways include Route 33, which runs east to west through the north of the Township, and Interstate 195, which traverses east to west along the southern portion of Millstone. County Route 537 forms the southern boundary of the Township and is bisected by Interstate 195.

Millstone does not have any local public transit services or train stations. Monmouth County Division of Transportation offers the Ride in Monmouth Program, an on-demand, curb-to-curb transportation service for eligible residents. Additionally, several nonprofit transportation providers offer transportation services to qualifying Monmouth County residents.

HISTORIC RESOURCES

Two properties in the Clarksburg area of Millstone are listed on both the National and State Historic Registers. The Clarksburg School, built in 1925, has maintained historic value, while being utilized daily as municipal offices. The Methodist Episcopal Church, which was donated to the Township, has been partially restored.

TABLE 20 - INVENTORY OF STATE AND NATIONALLY LISTED HISTORIC PROPERTIES

Site	Address	State Listing Date	State ID	National Listing Date	National Reference
Clarksburg Methodist Episcopal Church	512 Stagecoach Rd	12/23/1998	3364	2/5/1999	99000084
Clarksburg School	470 Stagecoach Rd	9/29/1999	143	11/12/1999	99001316

Four additional sites have received opinions of eligibility from the State Historic Preservation Officer but have not yet been included on the National or State Registers. The properties are:

- The Nathaniel Cox House, 25 Millstone Road
- DeBaun Site (also in Monroe Township)
- Riverside 1 Archaeological Site
- Riverside 2 Archaeological Site
- Grey Archaeological Site

Other sites in the Township were identified in the Monmouth County Historic Sites Inventory, which was undertaken in 1982 and updated in 1992. Some of those sites have since been demolished or altered. No other sites or districts in the Township have received

UTILITIES

The Township of Millstone does not have any sanitary sewers or public water systems. Township residents and businesses rely upon individual on-site wells for their potable water supply. According to the Millstone Master Plan, major portions of the Township have significant on-site septic disposal constraints, and the development of package treatment plants is restricted by the New Jersey Department of Environmental Protection.

Electric within the Township is provided by PSE&G.

PUBLIC EDUCATION FACILITIES

The Millstone Township School District includes three local schools, accommodating students in preschool through eighth grade.

- Millstone Township Primary School
- Millstone Township Elementary School
- Millstone Township Middle School

Millstone does not have a high school and students often attend nearby Allentown High School, one of the Monmouth County Vocational or Magnet Schools, or Red Bank Regional High School.

PARKS, TRAILS & RECREATION FACILITIES

Within Millstone there are 2,600.8 acres of State parkland, 1,820.8 acres of County parkland, and 1,031.6 acres of Township owned parkland. Of the Township-owned lands, 292.7 acres are devoted to parks with active recreation facilities.

For a more detailed inventory of recreation and open space resources, please refer to the Conservation, Open Space, and Recreation Element of the Township Master Plan and the Recreation and Open Space Inventory (ROSI).

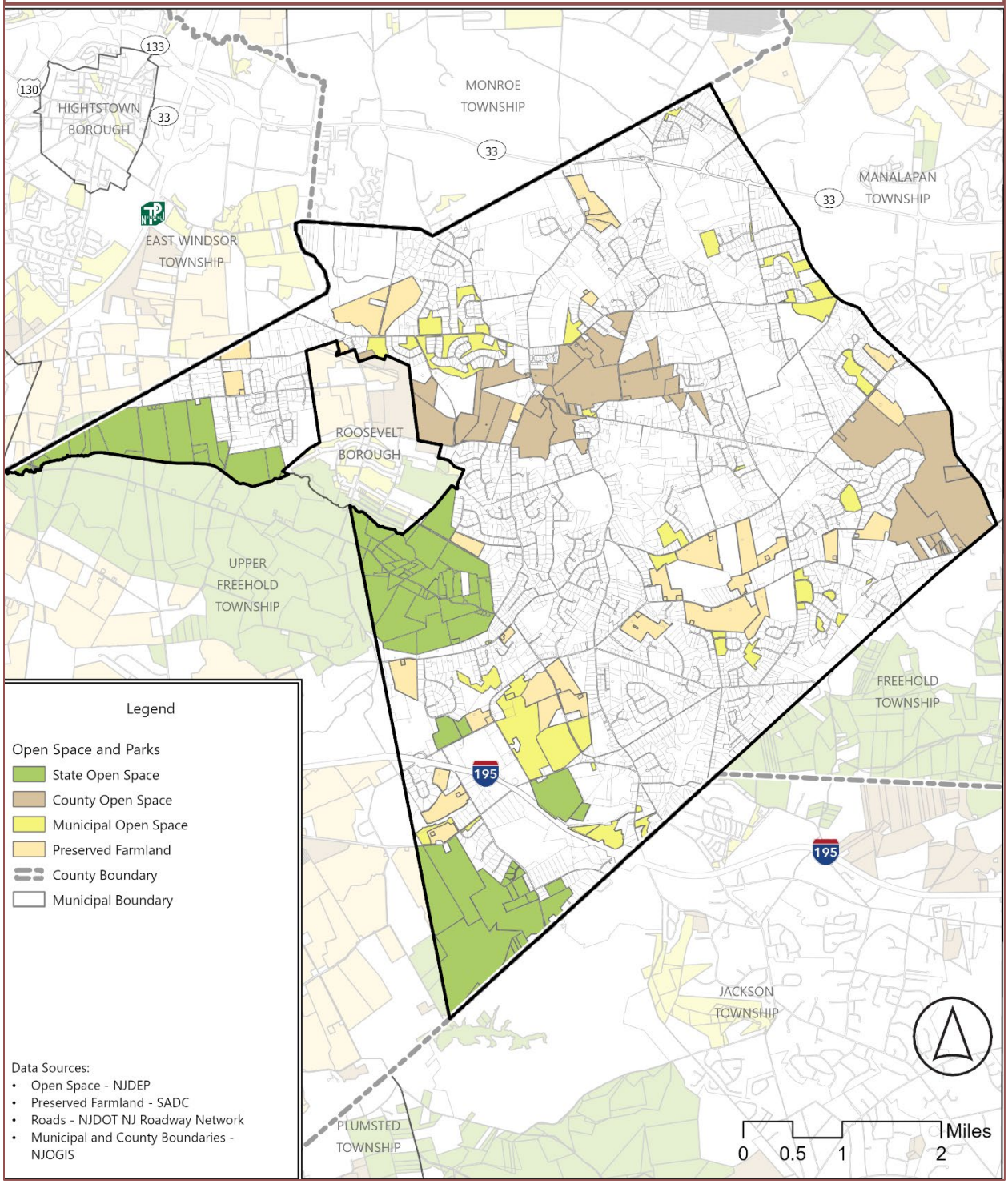
Millstone Parkland

- 2,600.8 acres of State parkland, inclusive of 656.8 acres of additional land over 2007 figures, consisting of the Assunpink Wildlife Management Area, the Prospertown Lake Wildlife Management Area, and an unnamed Preserved Watershed Tract;
- 1,820.8 acres of County parkland, inclusive of 564.8 acres of additional land over 2007 figures, consisting of Perrineville Lake Park and Charleston Springs Golf Course; and
- 1,031.6 acres of Township owned parkland, inclusive of 436.6 acres of additional land over 2007 figures, consisting of recreation and open space areas owned through fee simple purchase and easements on tracts and trails.
    - Township owned active recreation parks include:
        - Brandywine Soccer Complex
        - Abate Park
        - Millstone Park
        - Rocky Brook Park
        - Wagner Farm Park
        - Little League Fields

The Township has an active bridle / multi-use trail easement acquisition program included in the Township Ordinance. These linear pathways are multi-use, available for horseback riding, walking, cross-country skiing, snow shoeing, and bicycling. The easements for 20 acres of additional preserved land are listed on the Township's ROSI.

Map 22 - Parks and Open Space
Millstone Township, NJ

November 2026



KNOWN CONTAMINATED SITES

The NJDEP ranks contaminated sites into Remedial Levels to assist the allocation of department resources based on the contaminant and risks to public health, safety or the environment. Properties identified as Known Contaminated Sites ("KCS") may have contamination related to historic or current use and remediation may be actively being undertaken, monitored, or in other regulatory conditions. Common KCS include gas stations and other users and dispensers of gasoline, diesel, and similar fuels, dry cleaners, manufacturing and other industrial facilities, and the like. Remediation Levels for sites in Millstone include:

- C1: No formal design; source known or identified; potential groundwater contamination.
- C2: Formal design; known source or release with groundwater contamination.

TABLE 21 - KNOWN CONTAMINATED SITES PER NJDEP DATA MINER

Site ID	Name	Address	Lead	Status	Remediation Level
46637	Mustang Gas & Oil Former	504 Monmouth Rd	LSRP	Active	C2
343729	Silvi Concrete of Englishtown	470 Rt 33	LSRP	Active	C2
167282	Wurmbrandt Farm	53 Yellow Meeting House Rd	RAP	Active - Post Rem	
51876	County Service Ser Ltd	706 Perrinville Rd Aka Rt 571	LSRP	Active	C1
158725	Jersey Shore Peterbuilt	524 Monmouth Rd	LSRP	Active	
4308	Delta	454 Rt 33 W & Iron Ore Rd	LSRP	Active	C2
224165	Millstone Twp School	470 Stagecoach Rd	LSRP	Active	C2
29197	Clarksburg Amoco Block 59 Lot 11	508 Monmouth Rd	RAP	Active - Post Rem	
44492	Millstone Auto Service	716 718 Perrineville Rd	LSRP	Active	C2
639552	453 Rt 33	453 Rt 33	LSRP	Active	C2
66707	Hill House Horse Farm	54 Baird Rd	RAP	Active - Post Rem	

UNDERGROUND STORAGE TANKS

An underground storage tank system is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground.[21] Underground storage tanks contain hazardous substances such as gasoline, petroleum, and other regulated hazardous substances.

In New Jersey, underground storage tanks are regulated by the New Jersey Department of Environmental Protection under N.J.A.C. 7:14B. The NJCEP permits, monitors, and regulates underground storage tanks, with regular inspections for leaks to prevent possible contamination of water and soil. There are four active regulated underground storage tanks within Millstone, as shown in Table 20 and other identified USTs shown on Map 23.

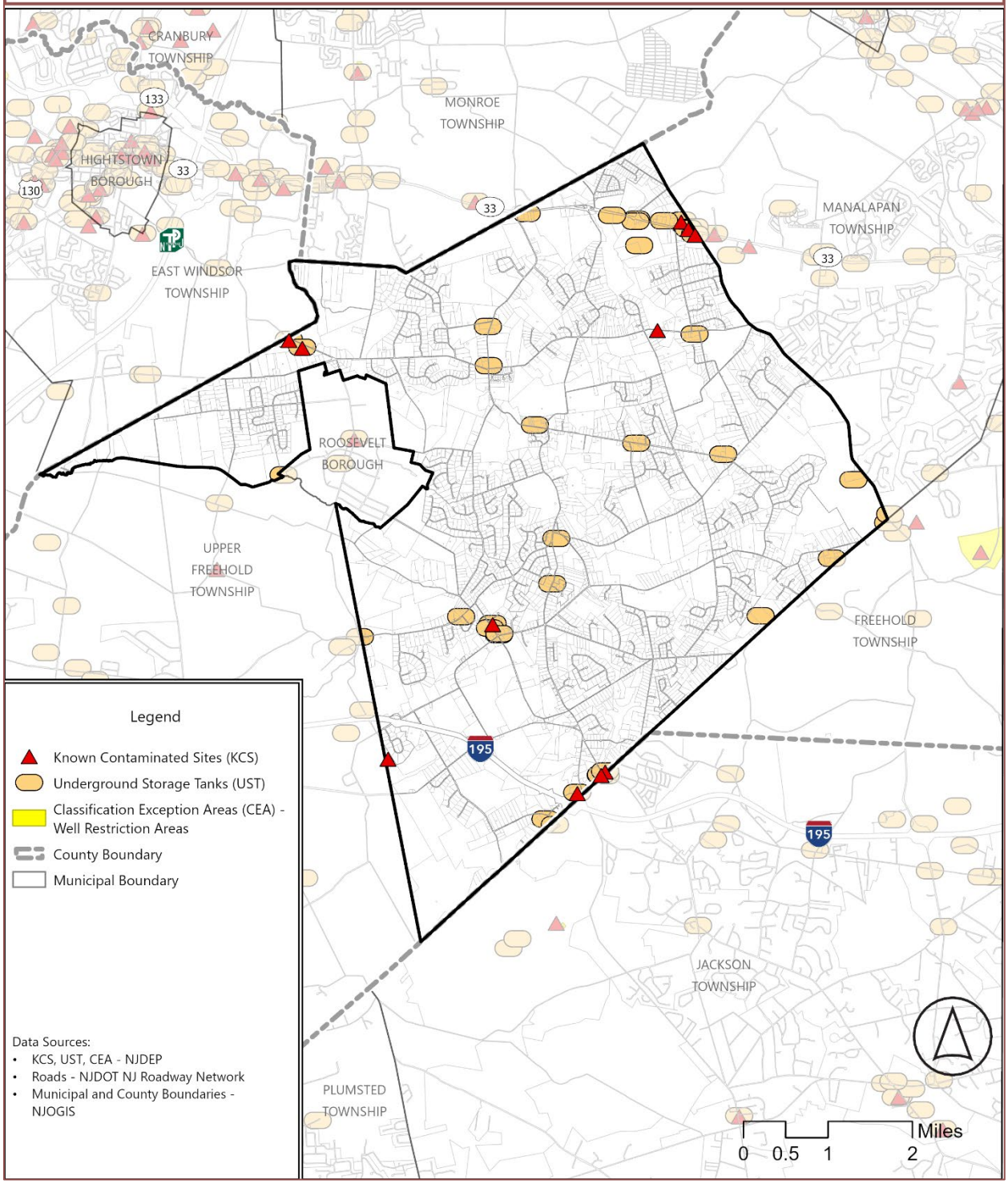
TABLE 22 - ACTIVE REGULATED UNDERGROUND STORAGE TANKS IN MILLSTONE

PI Number	Status	Expiration Date	PI Name	Address
022303	Effective	12/31/2026	Delta	454 Rt 33 W & Iron Ore Rd
031671	Effective	12/31/2026	R K Petroleum Usa Inc	519 Rt 33
031813	Effective	12/31/2027	Wawa Food Market #909	548 Monmouth Rd
032324	Effective	12/31/2026	Gulf Rg Petroleum	504 Monmouth Rd

[21] https://www.epa.gov/ust/learn-about-underground-storage-tanks

Map 23 - Known and Potential Contaminated Sites
Millstone Township, NJ

November 2026



AIR QUALITY

The U.S. Environmental Protection Agency regulates air quality through the federal Clean Air Act, which establishes the National Ambient Air Quality Standards (NAAQS). The Standards regulate the levels of criteria pollutants, which include carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2).

NATIONAL AMBIENT AIR QUALITY STANDARDS[22]

The Air Quality Index (AQI) is an air quality rating system based on the NAAQS that represents the risk to the public based on the severity of air pollution. The AQI is monitored continuously alongside the weather to notify the public of unhealthy pollutant levels.

AQI Level of Health Concern	*Numerical Value*	*Meaning*	*Color Code*
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk.	Green
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.	Yellow
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.	Orange
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.	Red
Very Unhealthy	201 to 300	Health warnings of emergency conditions. The entire population is more likely to be affected.	Purple
Hazardous	301 to 500	Health alert: everyone may experience more serious health effects.	Maroon

Figure 4 - Air Quality Index

The NJDEP Bureau of Air Monitoring operates 29 monitoring stations across New Jersey to measure NAAQS criteria pollutants. The monitors for O_3, NO_2, SO_2, CO & $PM_{2.5}$ are measured in real time and continuously transmit information to a central data acquisition system. Particulate matter and some air toxins are measured with filters for 24-hour concentrations. Samples are collected every few days, and the results are submitted to USEPA's database, and are summarized in our annual Air Quality Report. Volatile air toxins are collected in a canister that must be processed in a lab. Results are then submitted to USEPA's database and are summarized in our annual Air Quality Report.

Annual trends indicate that pollution levels in New Jersey have trended downward with occasional short term spikes due to a variety of factors.

The annual Air Quality Report documents the number of days on which the criteria pollutant levels exceed the NAAQS. These days are referred to as exceedance days. In 2024 New Jersey experienced 21 individual exceedance days. Twenty of the exceedance days were due to high levels of ozone. These exceedances are the result of weather conditions that favor the formation and transport of ozone. There was one exceedance day related to PM2.5 levels that occurred on July 5th. This exceedance is attributed to weather patterns that resulted in lingering firework smoke from Independence Day.

[22] https://dep.nj.gov/airmon/#1747751575163-add677b2-93bc

NJDEP AIR QUALITY PERMITTED FACILITIES

The Bureau of Stationary Sources at NJDEP regulates stationary sources of air pollution throughout the state. Permit requirements correspond to the type of facility and emissions, as defined by the program. Within Millstone there are no Major Air Quality Permitted Facilities. There are eleven Minor Air Quality Permitted Facilities within the Township, these include schools and school transportation sites, gas stations and convenience stores, manufacturing, and government support sites.[23]

CLIMATE

New Jersey's geographic location results in highly variable daily weather, with influences from wet, dry, hot, and cold airstreams. The State has five distinct climate regions, Northern, Central, Pine Barrens, Southwest, and Coastal, as shown in the map below.

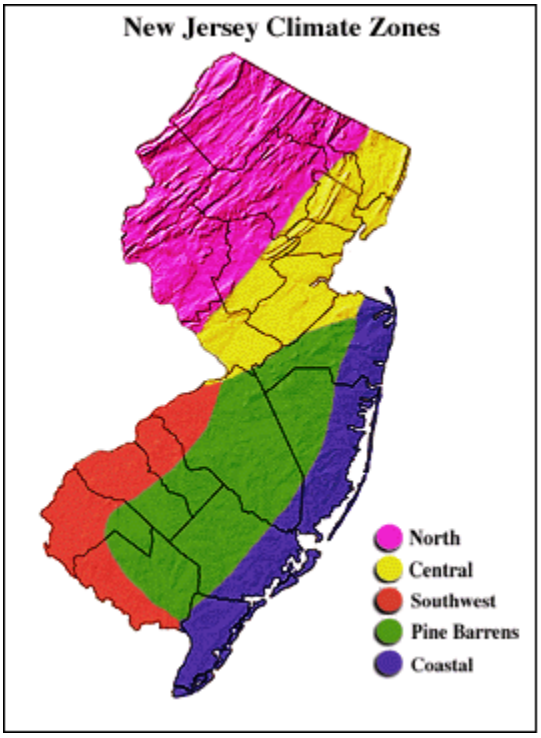


Figure 5 - Climate Zones

Millstone is located within the Pine Barrens region, named for the area's scrub pine and oak forests. According to the Office of the New Jersey State Climatologist, the region's porous sandy soil, which is not very fertile, has a major effect on the climate of this region. The soil allows precipitation to rapidly infiltrate, leaving surfaces dry which allows for a wider range between the daily maximum and minimum temperatures, and makes the area vulnerable to forest fires.[24] Millstone is on the edge of the Pine Barrens region and as noted elsewhere in this inventory, the soils and hydrology create substantial tracts of fertile and prime farmlands. The broader climactic effects present in the Pine Barrens and neighboring Central region both influence the Township.

[23] https://njogis-newjersey.opendata.arcgis.com/datasets/njdep::njdep-air-quality-permitted-facilities-of-new-jersey/about
[24] https://climate.rutgers.edu/stateclim/?section=njcp&target=NJCoverview

CLIMATE DATA

The Office of the New Jersey State Climatologist publishes Monthly Climate Tables for each county based on recorded and modeled climate data from the National Centers for Environmental Information. The Climate Tables include monthly averages for temperature, precipitation, and heating and cooling degree days. Data is provided for the period of record (1895-2026) and for the 30-Year Normal (1991-2020).

Temperature[25]

The annual average temperature in Monmouth County for the period of record is 52.5°F, while the 30-Year Normal is slightly higher at 54.3°F. Recent annual average temperatures (2022-2025) have been slightly above the 30-Year Normal, with the highest recorded average in 2024 of 56.6°F. The average annual temperature increase reflects the rise in global temperatures due to global climate change. Seasonally, average temperatures vary significantly, with a 30-Year Normal peak in July at 76.1°F and the low in January at 32.9°F. The annual average maximum 30-Year Normal temperature is 64.1°F with the peak in July (84.4°F). Annual average minimum temperature is 44.5°F with the lowest monthly average minimum temperature occurring in January (24.2°F).

Precipitation

According to the Office of the New Jersey State Climatologist, Measurable precipitation falls on approximately 120 days a year. With increasing temperatures, the atmosphere holds more water vapor, evaporation rates increase, and more precipitation is potentially produced.

Precipitation within Monmouth County for the period of record has an annual average of 45.74 inches, slightly lower than the 30-Year Normal annual average of 47.6 inches. The increase in the 30-Year versus the period of record annual precipitation reflects the Statewide trend of increased rainfall, with a 7% increase since the early 1900s and with the most intense events generating more rainfall compared to historical episodes.[26]

Average monthly rainfall is well distributed across the year, with the 30-Year peak in July (4.71 inches) and the 30-Year lowest rainfall amounts in November (3.36 inches).

Snow may fall from November 15 to April 15 in southern counties. According to the State of the Climate: New Jersey 2025, prepared by the new Jersey Climate Change Resource Center, as temperatures increase, the frequency of snowfall is expected to decrease.

However, while seasonal frequency and total amount of snowfall may decrease, snowstorms are still possible. Future snowstorms are likely to produce more snow due to the increased moisture availability in the atmosphere in a warmer climate. Supporting this idea is the fact that much of New Jersey's heaviest snowfall has occurred in recent years.[27]

Average annual snowfall in the 2025-2026 measured between 36 and 48 inches in Monmouth County, significantly higher than the previous season.

[25] https://climate.rutgers.edu/stateclim_v1/nclimdiv/index.php?stn=NJ025&elem=avgt
[26] State of the Climate: New Jersey 2025. Rutgers, The State University of New Jersey, New Brunswick, NJ
[27] State of the Climate: New Jersey 2025. Rutgers, The State University of New Jersey, New Brunswick, NJ

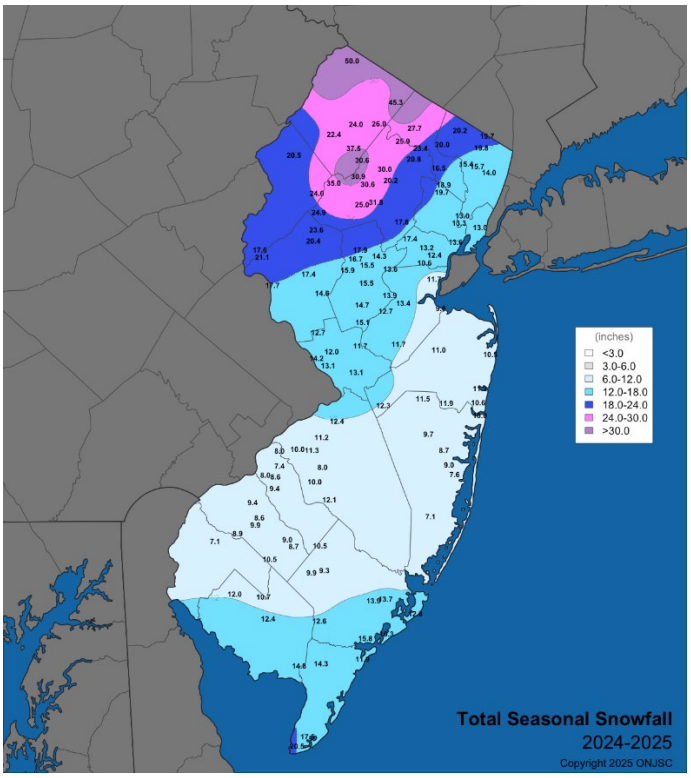


Figure 6 - 2024-2025 Total Seasonal Snowfall (Source: Office of the New Jersey State Climatologist)

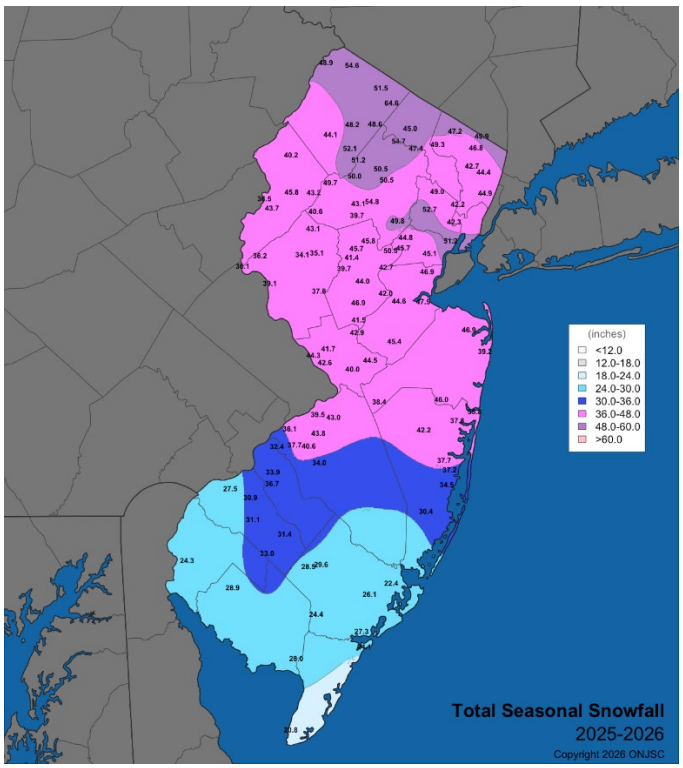


Figure 7 - 2025-2026 Total Seasonal Snowfall (Source: Office of the New Jersey State Climatologist)

Heating/Cooling Degree Days

Degree days are a measure of how hot or cold a location is. Degree days compare the mean temperature to a standard temperature defined as 65°F. If the mean temperature is above 65°F, the base temperature (65°F) is subtracted from the mean, and the result is Cooling Degree Days. If the mean temperature is below 65°F, the base temperature is subtracted from the mean, and the result is Heating Degree Days. The patterns of degree days can be utilized in the assessment of the climate and in determining the heating and cooling needs for the area.

Monmouth County has a 30-Year annual average of 4,837 Heating Degree Days, with a peak in January with 996 Heating Degree Days. The County experienced a 30-Year annual average of 972 Cooling Degree Days, with the monthly peak occurring in July with 345 days.

CLIMATE CHANGE[28]

Climate change is driven by increases in greenhouse gas concentrations causing additional heat to be absorbed by Earth's atmosphere. Human activities have further increased emissions and is recognized as the primary driver of climate change. According to the 2025 New Jersey Scientific Report on Climate Change, prepared by the NJDEP, as a result of climate change New Jersey will experience significant direct and secondary changes in its environment, including increases in:

- Temperature
- Variability in precipitation
- Frequency and intensity of storms
- Sea-level rise
- Ocean acidification
- Associated impacts to ecological systems, natural resources, human health, and the economy

New Jersey is expected to experience continued increases in temperature as global greenhouse gas concentrations rise. Increased temperatures degrade air quality by increasing pollutants, creating conditions conducive to wildfires, and extending the pollen allergy season. Continued increases in temperature will also intensify heat waves, and increase risks to public health, infrastructure, and ecosystems.

Analysis by Rutgers University reported that under an intermediate emission scenario the average annual temperatures in New Jersey are projected to increase 3.7 to 6.2°F by the end of the 21st century relative to the 1991–2020 average. [29] Data from the Office of the New Jersey State Climatologist indicates that the region in which Millstone is located is warming faster than both the global and regional averages. Seasonally, winter shows the greatest temperature increase, with an average increase of 5.4°F.

[28] 2025 New Jersey Scientific Report on Climate Change
[29] State of the Climate: New Jersey 2025. Rutgers, The State University of New Jersey, New Brunswick, NJ

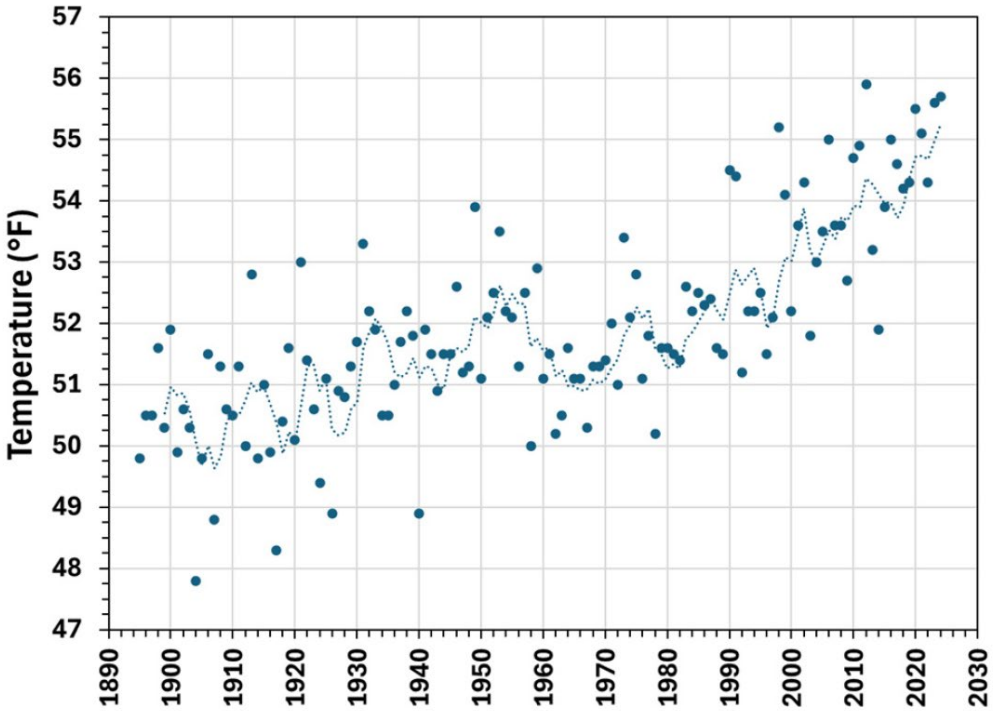


Figure 8 – New Jersey 12-month average air temperatures from 1895 to 2024.
Blue points represent the average annual temperature and the dashed line represents a five year average of those points.
(Source: State of the Climate: New Jersey 2025)

As temperatures increase, the atmosphere holds more water vapor, leading to a higher chance for precipitation. Additionally, a warmer atmosphere increases the likelihood of more intense and more frequent storms. Due to the increasing variability of the amount and timing of precipitation events an increase frequent and prolonged dry periods and increases in the number of flood events are expected.

Annual precipitation and the number of extreme precipitation events are difficult to predict due to the various meteorological factors involved. However, it is generally accepted that warmer temperatures will increase the potential energy in storm systems, increasing the intensity. Several data sources and periods of analysis support the significant upward trend in heavy precipitation that is occurring in the Northeast. Extreme storms in New Jersey include nor'easters, snowstorms, thunderstorms, tropical storms, and hurricanes. In New Jersey from 1958 to 2021, storms that resulted in the heaviest 1% of daily events have increased in amounts by 60%.[30]

[30] State of the Climate: New Jersey 2025. Rutgers, The State University of New Jersey, New Brunswick, NJ

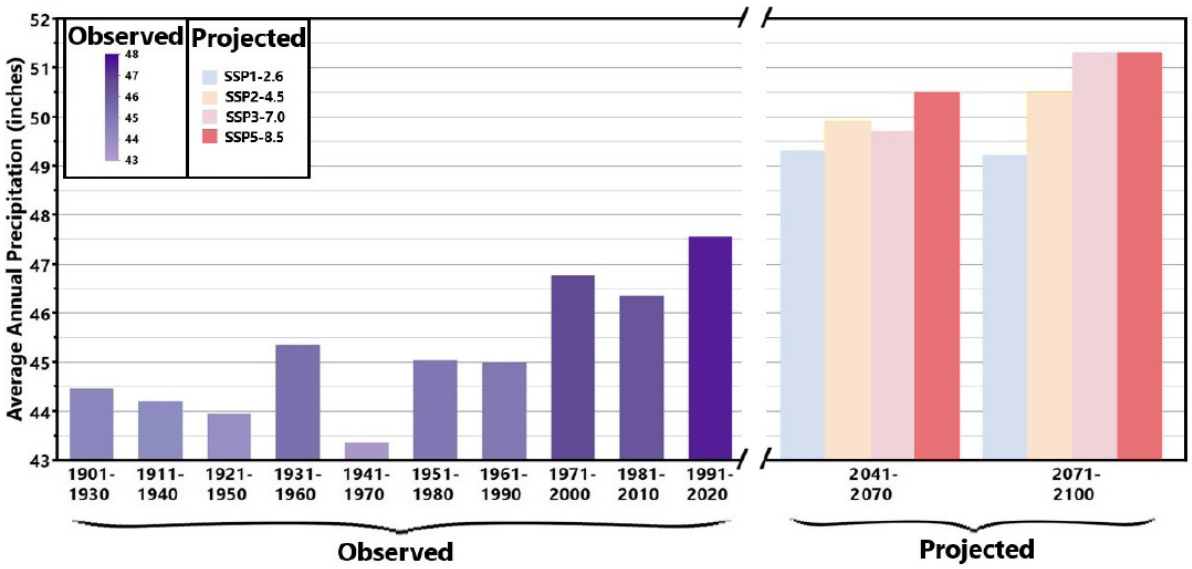


Figure 9 - Observed and Projected average annual precipitation in New Jersey (Source: State of the Climate: New Jersey 2025)

The impacts of the increasing temperature are extensive. The warmer temperatures contribute to an increase in air pollution, which will reduce visibility, damage crops and forests, and adversely impact human health. Additionally, water supplies will be stressed from extreme temperatures, and water quality will be impaired as increased nutrients and contaminants enter water due to runoff from more intense rain events.

PLANT HARDINESS ZONES[31]

Established by the US Department of Agriculture (USDA), the Plant Hardiness Zone Map (PHZM) is based on the average annual extreme minimum winter temperature, displayed as 10-degree Fahrenheit zones ranging from zone 1 (coldest) to 13 (warmest). Each zone is divided into half zones designated as 'a' and 'b'. Plant Hardiness Zone Maps (PHZM) act as general guides for growing perennial plants.

According to the 2023 USDA PHZM, the entirety of New Jersey falls within Zones 6b to 8a. Monmouth County includes areas identified as both 7a and 7b, with Millstone located within the 7b zone. Zone 7b has an average annual extreme minimum temperature between 5°F and 10°F.

GROWING SEASONS

The agricultural growing season refers to the time between the last front in the spring season to the first frost of the fall. The growing season in Millstone is approximately 180 days. Millstone's first frost is typically in the middle of October, and the last frost occurs at the end of April.

[31] https://planthardiness.ars.usda.gov/

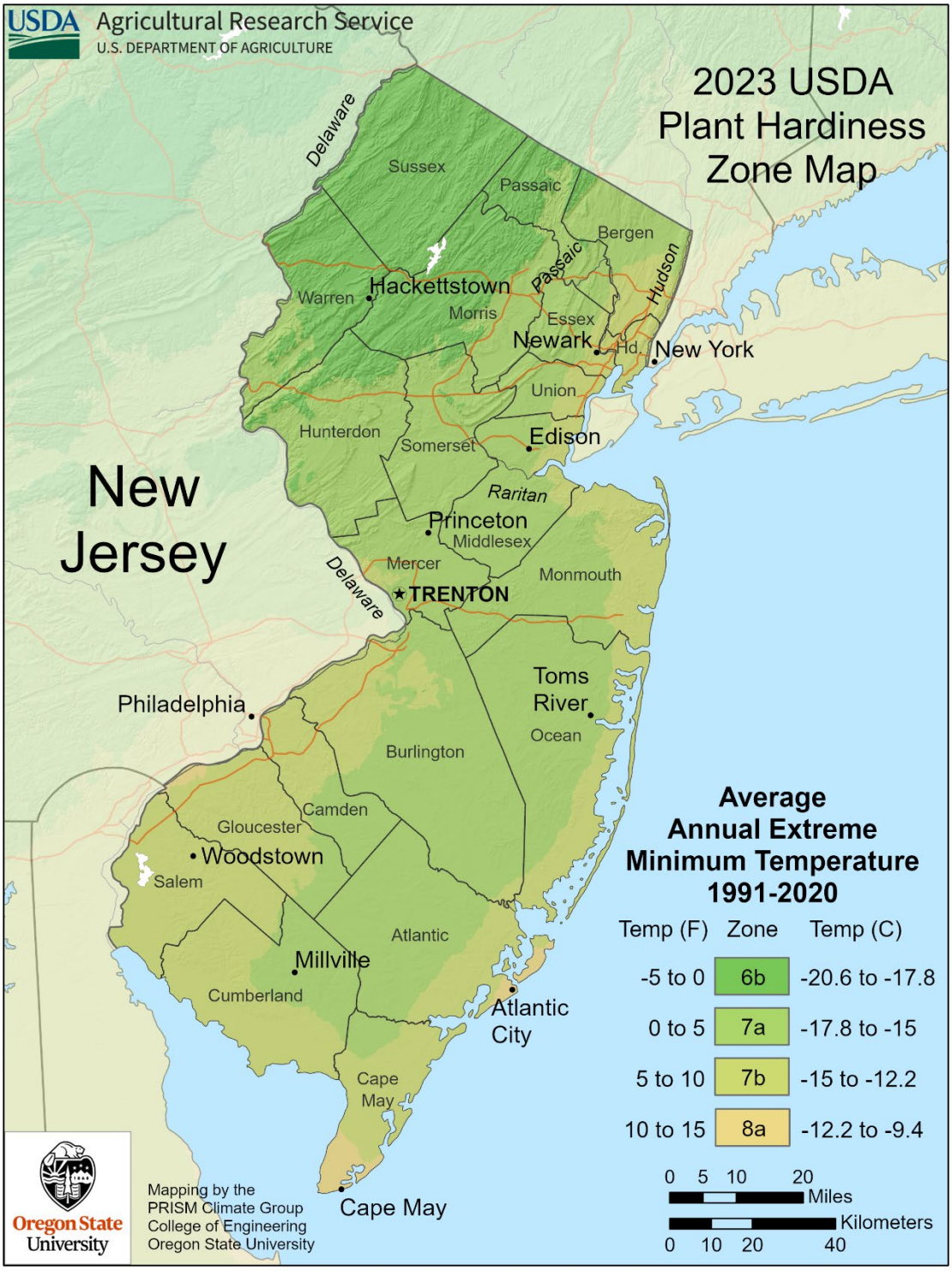


Figure 10 – 2023 USDA Plant Hardiness Zone Map