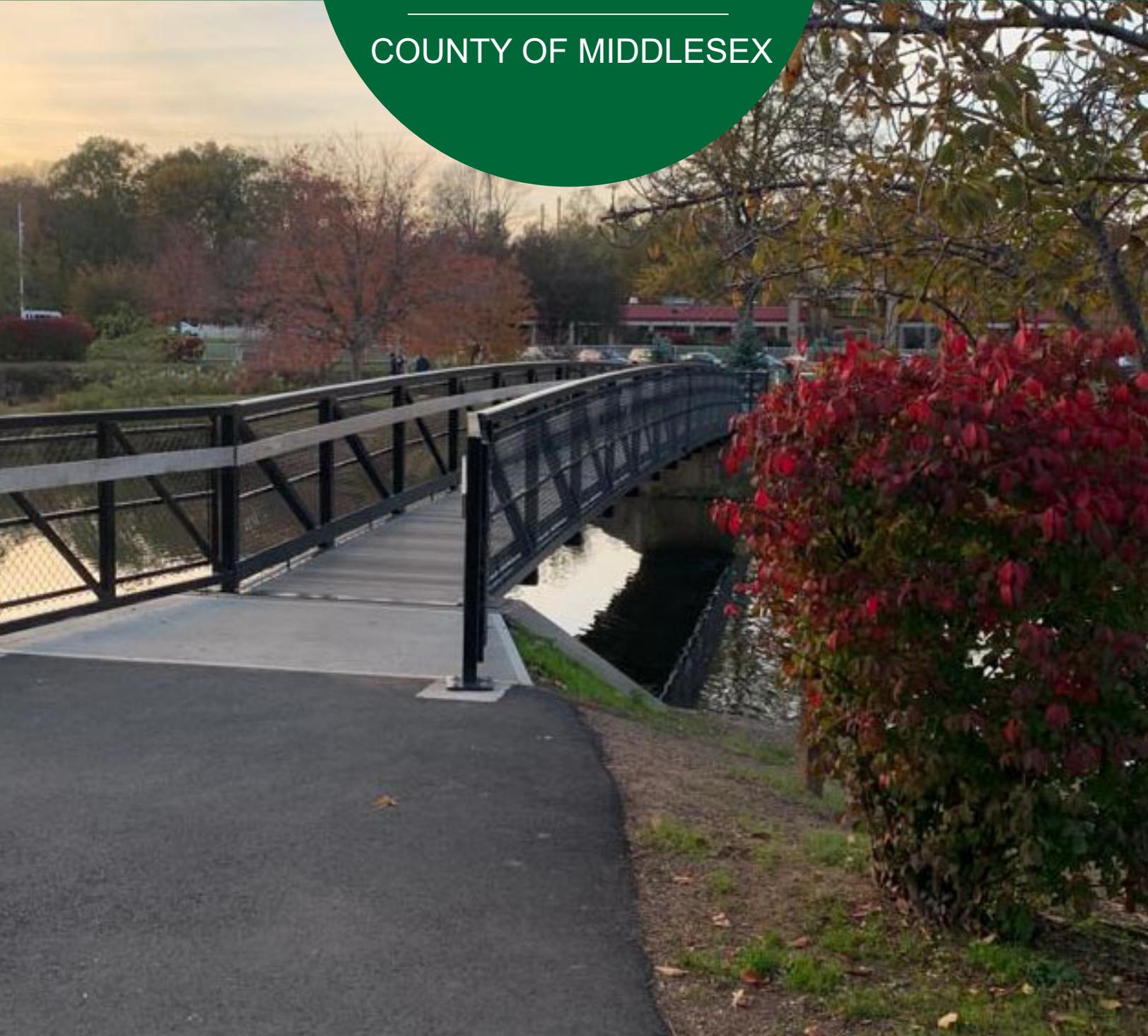


TOWNSHIP OF EDISON

ENVIRONMENTAL RESOURCE INVENTORY UPDATE

COUNTY OF MIDDLESEX



May 19, 2021



ENVIRONMENTAL RESOURCE INVENTORY UPDATE

for

Township of Edison County of Middlesex

Prepared May 19, 2021 by:

The Land Conservancy of New Jersey

An accredited land trust

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Township of Edison County of Middlesex

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May 19, 2021

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**2020 Members of the Environmental Commission*

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Cover Photograph: Roosevelt Park

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- Geology and Topography: Roosevelt Park
- Soils: Boat Launch
- Land Use: Roosevelt Park
- Plant Communities: Middlesex Greenway
- Wildlife Communities: Middlesex Greenway
- Hydrology and Water Quality: Boat Launch
- Wetlands, Riparian Areas, Flood Zones: Boat Launch
- Air: Boat Launch
- Climate: Roosevelt Park
- Historic and Cultural Features: Boat Launch
- Regional Relationships and Transportation: Raritan Center Parkway Wetland Mitigation
- Known Contaminated Sites: Raritan Center Parkway Wetlands Mitigation Projects

The information and maps presented in this report are intended for preliminary review and cannot substitute for on-site testing and evaluations. The maps for the Environmental Resource Inventory Update were developed using NJDEP Geographic Information System digital data.



Executive Summary

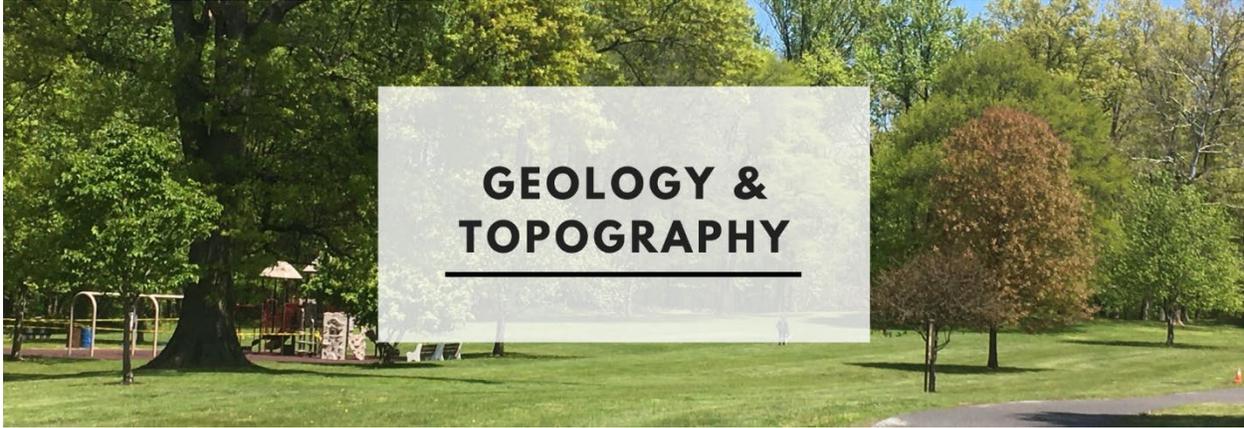
With nearly seven miles of the Raritan River forming Edison Township's southern border, and Dismal Swamp, a 1,240-acre marsh/wetland, in its northern corner, Edison is a community rich in natural resources. Home to more than 100,000 residents, Edison is the fifth most populous municipality in the State of New Jersey.

Located in the north-central portion of Middlesex County, the Township of Edison surrounds the Borough of Metuchen and borders Piscataway and South Plainfield Townships to the west, the Borough of Highland Park and the City of New Brunswick to the south and west, East Brunswick Township to the south, the Borough of Sayreville to the south and east, Woodbridge Township to the east, and Clark Township, Scotch Plains Township, and the City of Plainfield to the north in Union County. (*Map 1*) Residents have easy access to mass transportation and major roadways convenient to Manhattan and the New York metropolitan area.

The Township's initial *Environmental Resource Inventory* (ERI) was completed in 2011 by Heyer, Gruel, and Associates in collaboration with the Edison Township Environmental Commission. This update to the ERI utilizes the most recent scientific data and is consistent with the guidelines of the Association of New Jersey Environmental Commissions (ANJEC) and fulfills the requirement of ERI updates identified by the Sustainable Jersey certification program.

The information presented in the ERI Update incorporates federal, state, and municipal data to assess the current state of resources for the Township. The submittal of an *Environmental Resource Inventory Update* will help meet the Township's goal of being a sustainable community. The Environmental Commission will add new material to the ERI as it becomes available.

The ERI will assist the community as it makes decisions regarding future planning and development. Knowledge of the natural resources will allow the Township's officials and citizens to make informed decisions as they strive to preserve and promote the character of the municipality and to create a sustainable community within its landscape.

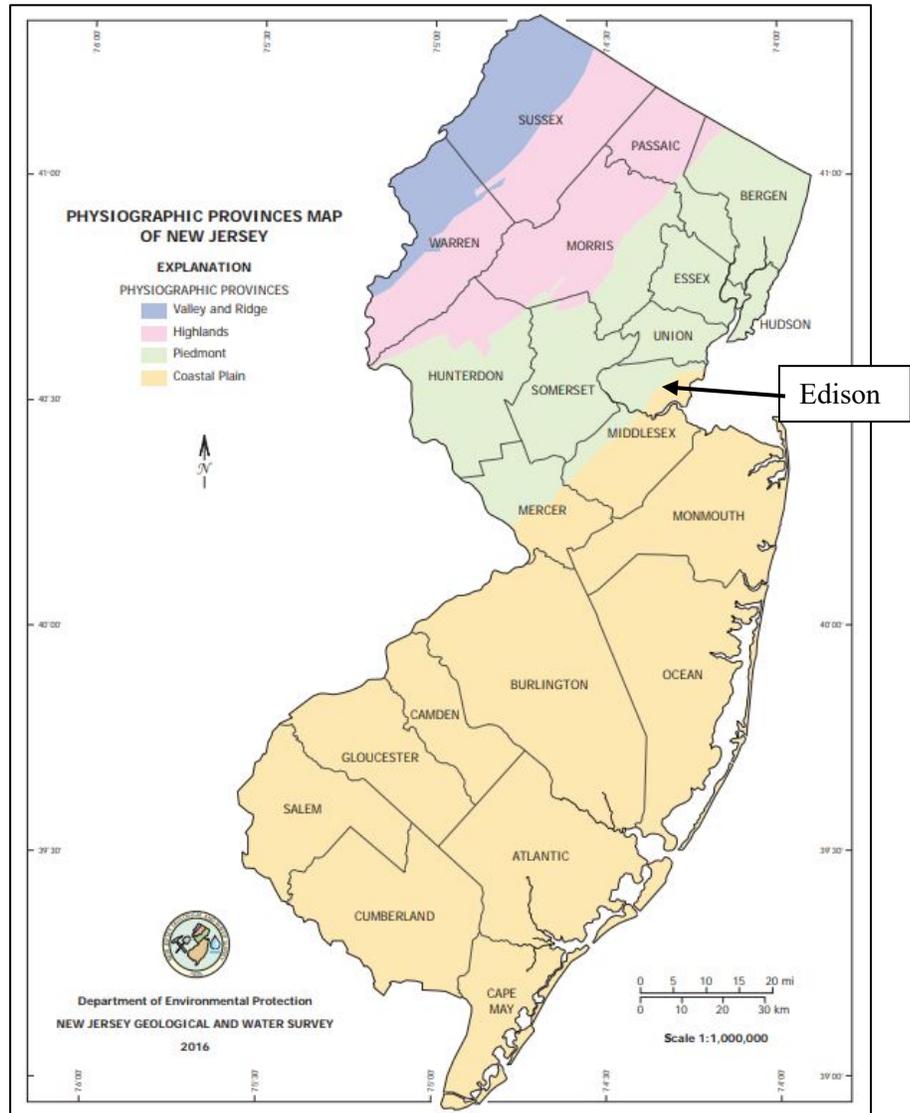


Geology and Topography

Physiographic Provinces

New Jersey’s landscape is divided into four distinctive regions, each characterized by unique geologic processes and landforms, known as physiographic provinces. Physiographic provinces classify landscapes based on terrain texture, rock type, and geologic structure and history. These attributes play an important role in determining the natural resources of an area. In New Jersey, beginning in the northwest and proceeding to the southeast, these provinces are identified as the Valley and Ridge, Highlands, Piedmont, and Coastal Plain Provinces. Edison is in the Piedmont and Coastal Plain Provinces. (Figure 1 and Map 2)

Figure 1. Physiographic Provinces in New Jersey
NJDEP Geological and Water Survey



The Piedmont Province covers 1,600 square miles, which is roughly 20% of the state. Seventy percent of Edison Township is in the Piedmont Province. According to the New Jersey Department of Environmental Protection New Jersey (NJDEP) Geological and Water Survey, the Piedmont is mostly underlain with “slightly folded and faulted sedimentary rocks of Triassic and Jurassic age (240 to 140 million years old) and igneous rocks of Jurassic age.” The Piedmont Province’s surface is generally low rolling hills marked with sudden, steep ridges, which extend across the state and includes the Palisades in the east.¹

The Coastal Plain Province has an area of 4,667 square miles and occupies about three-fifths of the state. It includes all Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean, and Salem Counties as well as parts of Mercer and Middlesex Counties. Unconsolidated deposits of the Coastal Plain range in age from the upper Lower Cretaceous to the Miocene (90 to 10 million years old).²

Bedrock Geology

The geology of Edison can be classified into two components: **bedrock geology**, which is consolidated, underlying rock that extends deep into earth’s crust; and **surficial geology**, the unconsolidated sedimentary materials overlaying bedrock formations and is the parent material for soils. The properties of these layers

“determine the physical extent of aquifers and the chemical quality of the water they yield. They also control how groundwater recharges and moves through the aquifers, how contaminants seep into and move through soil and groundwater, and where natural hazards like radon, sinkholes, and seismic instability may occur. Finally, these properties establish where geologic resources such as sand, gravel, peat, clay, quarry rock, and mineral ores are located. Geologic properties also determine the suitability of an area for the use of septic systems, the management of stormwater and surface runoff, and the stability of foundations for buildings, bridges, tunnels, and other structures.”³

Understanding bedrock composition is important both for understanding the natural history of a region, as well as determining the stability of buildings, bridges, and wells. The bedrock geology of Edison in the Piedmont Province is composed of the Passaic Formation that stretches in a band from central-western to northeastern New Jersey underlying portions of Hunterdon, Mercer, Somerset, Middlesex, Union, Essex, and Bergen Counties. (**Figure 2**, **Figure 3** and **Map 2**) The Passaic Formation lies on a sedimentary bedrock of siltstone, shale, sandstone, and conglomerate, as well as an igneous and metamorphic bedrock of basalt.⁴ Its lithology is reddish-brown to brownish-purple and grayish-red siltstone and shale.⁵ In New Jersey, sedimentary rock is typically less than 5 million years old and 400 feet thick, while in northern New Jersey, it can be more than 1 billion to 200 million years old and has been molded by periods of collisions and rifting over time.⁶

The bedrock geology in Edison within the Coastal Plain Province is the Raritan Formation. (**Table 1**) The Raritan Formation is composed of an upper clayey silt (Woodbridge Clay Member) and a lower sand (Farrington Sand Member).⁷ Woodbridge Clay was extensively mined in Middlesex County until approximately 1968⁸ for products such as bricks and pottery.⁹

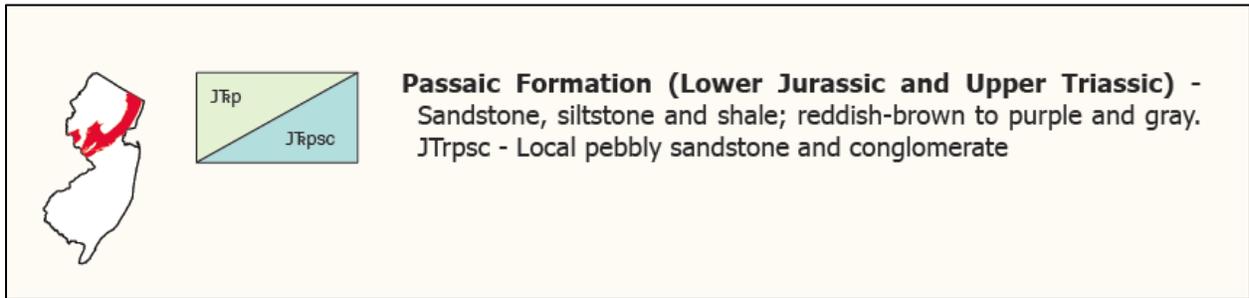


Figure 2. Bedrock Geology Map Unit for Roselle Park – Passaic Formation
NJDEP Geological and Water Survey

Table 1. Edison Township Bedrock Geology					
Abbreviation	Geologic Name	Physiographic Province	Lithology	Acres	Percentage
JTrp	Passaic Formation	Piedmont (13,725 acres, 70%)	Siltstone and shale	12,350	63%
JTrpms	Passaic Formation Mudstone		Sandy mudstone	894	4.6%
Trpg	Passaic Formation Gray bed		Sandstone, siltstone, and shale	481	2.5%
Kr	Raritan Formation	Coastal Plain	Clayey silt overlying quartz sand	5,887	30%
Total:				19,611	100%
<i>Source: NJGS Bedrock Geology 2007, NJDEP</i>					

Surficial Geology

Surficial deposits, layered above bedrock, are sediments deposited by rivers, glaciers, ocean currents and waves, wind, and movement of soil and rocks on hillslopes. The primary surficial formations in Edison include estuary and salt marsh deposits along the Raritan River and the Pensauken formation in the central section of the Township. (*Table 2, Map 3*)

Figure 3. Bedrock Geology in New Jersey (NJDEP Geological and Water Survey)

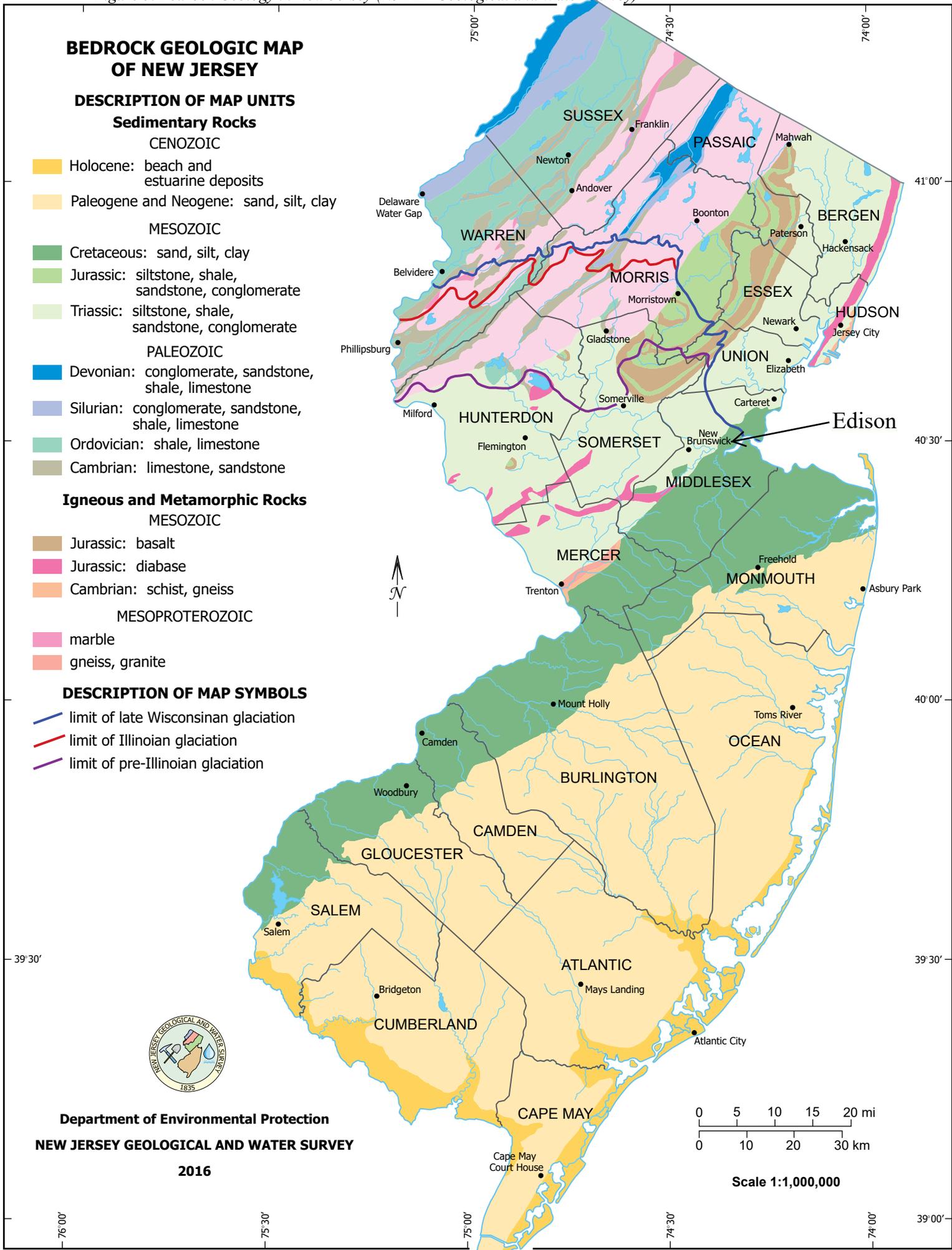


Table 2. Surficial Geology in Edison Township

Abbr.	Name	Lithology	Acres	Percent
Qwmtr	Late Wisconsinan Terminal Moraine Deposits, Rahway Till	Rahway Till as in unit Qwtr forming morainic ridges and knolls. As much as 200 feet thick.	4298.19	21.91%
Qws	Weathered shale, mudstone, and sandstone	Silty sand to silty clay with shale, mudstone, or sandstone fragments; reddish brown, yellow, light gray. As much as 10 feet thick on shale and mudstone, 30 feet thick on sandstone.	3585.75	18.28%
Tp	Pensauken Formation	Sand, clayey sand, pebble gravel, minor silt, clay, and cobble gravel; yellow, reddish yellow, white. Sand typically includes weathered feldspar. Locally iron cemented. As much as 140 feet thick.	3346.5	17.06%
Qmm	Salt-Marsh and Estuarine Deposits	Silt, sand, peat, clay, minor pebble gravel; brown, dark-brown, gray, black. As much as 300 feet thick in the Hudson valley, 100 feet thick elsewhere.	2231.92	11.38%
Qwtr	Rahway Till	Clayey silt to sandy silt with some to many pebbles and cobbles and few boulders; reddish brown, reddish yellow, yellowish brown, brown. As much as 100 feet thick, generally less than 40 feet thick.	2066.65	10.54%
Qwfv	Late Wisconsinan Glaciofluvial Plain Deposits	Sand, pebble-to-cobble gravel, minor silt; yellowish brown, reddish brown, light gray. As much as 150 feet thick.	1818.04	9.27%
Qwcp	Weathered coastal plain formation	Exposed sand and clay of Coastal Plain bedrock formations. Includes thin, patchy alluvium and colluvium, and pebbles left from erosion of surficial deposits.	1096.43	5.59%
Qs	Swamp and Marsh Deposits	Peat and organic clay, silt, and minor sand; gray, brown, black. As much as 40 feet thick.	409.91	2.09%
Qal	Alluvium	Sand, gravel, silt, minor clay and peat; reddish brown, yellowish brown, brown, gray. As much as 20 feet thick.	376.68	1.92%
Qtl	Lower Stream Terrace Deposits	Sand, pebble gravel, minor silt and cobble gravel; reddish brown, yellowish brown, reddish yellow. As much as 30 feet thick.	345.19	1.76%
Qwde	Late Wisconsinan Glacial Delta Deposits	Sand, pebble-to-cobble gravel, minor silt; yellowish brown, reddish brown, light gray. As much as 150 feet thick.	36.06	0.18%
Total:			19,611.30	100%
<i>Source: NJGS Surface Geology 2006, NJDEP</i>				

Topography

The terrain of Edison is mostly flat with slopes running into the Raritan River and South Branch of the Rahway River, among other smaller waterways.¹⁰ Most of the Township has an elevation range of 0-100 feet (11,440 acres) and 101-200 feet (8,163 acres). There are very few areas in the Township where the elevation reaches the 201-300 elevation range. (*Map 4, Table 3*)

Table 3. Elevation of Edison Township		
Elevation (feet)	Acres	Percent
0-100	11,440.23	58.33%
101-200	8,162.61	41.62%
201-300	8.46	0.04%
Total:	19,611.30	100.00%
<i>Source: NJDEP</i>		

Limiting the disturbance of steep slopes is important in preventing soil loss, erosion, excessive stormwater runoff, and the degradation of surface water, as well as maintaining the natural topography and drainage patterns of the land. Steep slopes are categorized as:

“Any slope equal to or greater than twenty (20%) percent as measured over any minimum run of ten (10) feet, or (ii) a slope area of twelve (12%) percent or greater having a rise of five (5) vertical feet or greater. Steep slopes are determined based on contour intervals of two (2) feet or less based upon reliable data.”¹¹

Disturbing the natural vegetation, topography, and drainage patterns of steep slopes often increases the quantity and speed of runoff and can cause erosion, soil creep, slumping (sections of soil shifting down and outward on the slope), and landslides. The combination of unstable slopes and greater runoff means that more water and sediment (silt) enter streams during precipitation events. Increases in water volume entering streams can increase flooding downstream. In addition, an increase in runoff entering streams means less water is percolating through the soil and back into the groundwater. This percolation helps replenish drinking water supplies and provides a base flow for streams during drier periods in the area. The increased water runoff also carries larger loads of sediment compared to predevelopment conditions. Excess sediments in streams can harm aquatic life, accelerate the filling of ponds and wetlands, and diminish a stream’s aesthetic.

Edison Township’s Municipal Code contains an ordinance for the preservation of steep slopes that may be vulnerable to erosion and other risks. The *Steep Slope Conservation and Protection Ordinance* is intended to regulate the usage of steep slope areas in the Township to limit “soil loss, erosion, excessive stormwater runoff, the degradation of surface water and to maintain the natural topography and drainage patterns of land.”¹²



Soils

Soils play a critical role in the environment. They support an area’s vegetation, absorb rainwater, and provide habitat. The physical and chemical properties of soils reflect many variables, including the parent material (bedrock), climate, vegetative cover, animal activities, slopes and drainage patterns, and time. New Jersey’s complex bedrock geology, history of glaciations, abundant precipitation, and patterns of human use have led to complex patterns of soil distribution.¹³

Soil can shape a landscape through the plants it supports and the water it absorbs. Vegetation, supported by a variety of soils, can provide shelter for animals and food for people. In this way, everything from our food supply to the stable foundations of our homes depends upon soil.¹⁴ The components of soil can vary greatly depending on the parent material, the climate of the region, human and animal activity, and water and drainage patterns. Soil health is the ability of soil to sustain plants, animals, and people, shaping its surrounding ecosystem. Within soil are living organisms, including fungi, bacteria, and microbes. Their health, and thus, the health of the soil, is determined by nutrients, rainwater, and human-influenced pollutants.¹⁵

Soil Classifications

The official Soil Survey for Middlesex County was updated in 2019 by the Natural Resources Conservation Service (NRCS), an agency of the United States Department of Agriculture (USDA). The soils maps and tables in the *ERI Update* are based on the data from that official survey.

The NRCS Soil Survey plots soils by map units.¹⁶ The Soil Survey names each map unit based on the characteristics of the dominant soils within that unit. These map unit names identify the soils by their soil series classification(s). Each map unit name has an associated abbreviation that offers a shorthand version of the naming/classification system. This abbreviation system identifies the soil types by steepness, stoniness, and frequency of flooding as follows:

- Capital letters at the end of the abbreviation indicate the slope, “A” being less steep and “E” being steeper. An example is the Boonton series, which includes BouB, BouC, and BouD.

- Small letters following these capital letters indicate stoniness. “a” “b” or “c” indicate the degree of stoniness: stony, very stony, and extremely stony. An example of this is the Haledon silt loam series, where HanBc indicates extremely stony.
- Small letter “t” at the end of an abbreviation indicates “frequently flooded.” An example of this is UcDA_t, Udifluents, 0 to 3 percent slopes, frequently flooded.

The Soil Survey also categorizes each map unit as one of four map unit types: consociations, complexes, associations, and undifferentiated groups. The soils in Edison fall into two groups: consociation and complexes.

Consociations (Cn) are named for the dominant soil. In a consociation, delineated areas use a single name from the dominant component in the map unit. Dissimilar components are minor in extent. Consociations represent 57% (11,113 acres) of Edison’s total area. An example of this soil type in Edison is the Haledon silt loam, 0 to 3 percent slopes.

Complexes (Cx) consist of two or more dissimilar components that occur in a regularly repeating pattern. The total amount of other dissimilar components is minor in extent. Complexes represent 43% (8,479 acres) of Edison’s total area. An example of this soil type in Edison is the Boonton-Urban land-Haledon complex.

The soil types in Edison Township are shown in *Map 5* and included in *Appendix A*.

Major Soils Series

Soils with similar profiles are a soil series. The most prevalent soil series in Edison, listed from largest to smallest area, are Boonton (25%), Nixon (10.1%), Klinesville (7.5%), Pawcatuck (7.3%), Parsippany (7.1%), Haledon (6.7%), and Lansdowne (5.1%). The remainder of the soil series in Edison each make up less than 5% of total soil composition. Urban land makes up 12% of Edison. *Appendix B* identifies the major soil series table and provides descriptions to give further information about these soils.

Soil Series Descriptions

The following soil series descriptions are from the NRCS: ¹⁷

Boonton

Slope ranges from 0 to 50 percent. Saturated hydraulic conductivity is moderately low to high in the mineral soil above the fragipan, low or very low in the fragipan, and low to high below the fragipan.

Haledon

The Haledon series consists of very deep, somewhat poorly drained soils in low positions on undulating uplands. They formed in glacial till. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity is moderately high or high above the fragipan and very slow or slow in the fragipan and densic materials.

Udorthents

Udorthents consist of areas that have been transformed by earth moving, including grading, cut and fill, residential development, commercial and industrial buildings, cemeteries, and recreational areas. This soil typically has human artifacts and ash from coal mixed in and generally is comprised of loamy material in the upper sections of the soil and sandy-to-loamy material in the lower part.

Nixon

The Nixon series consists of deep, well-drained soils which formed in old alluvium and contain detectable red shale detrital components in the coarse fragments and fine earth fractions. Permeability is moderate in the solum and moderately rapid in the substratum. In Edison, the Nixon series accounts for 10% of soil.

Klinesville

The Klinesville series consists of shallow, somewhat excessively drained soils formed in residuum derived from red shale, siltstone, slate, and fine-grained sandstone. They are on dissected uplands. Slopes range from 3 to 80 percent. Saturated hydraulic conductivity is high.

Lansdowne

The Lansdowne series consists of deep and very deep, moderately well-drained and somewhat poorly drained soils on uplands. They formed in old, red glacial till and the underlying residuum weathered from red shale, siltstone, or fine-grained sandstone. Slopes are 0 to 6 percent.

Pawcatuck

The Pawcatuck series consists of very deep, very poorly drained soils formed in herbaceous organic deposits over sandy mineral material. They are in tidal marches subject to inundation by saltwater twice daily. Slope ranges from 0 to 1 percent. Saturated hydraulic conductivity is moderately high to very high in the organic layers and very high in the underlying mineral sediments.

Parsippany

The Parsippany series consists of deep, poorly drained soils in extinct lake basins and near streams. They formed in silty and clayey sediments. Slope ranges from 0 to 8 percent. Permeability is moderate in the surface horizons, slow or very slow in the subsoil, and moderately rapid to very slow in the substratum. Parsippany soils are subject to seasonal flooding.

Soil Characteristics

Hydric Soils

According to the Natural Resources Conservation Service, “A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.” Hydric soils are an important element of wetland areas and naturally support wetland vegetation. If a soil is classified as “hydric,”

Federal/State Wetlands Law may restrict land use due to the relationship of hydric soils to wetlands and wetland preservation.¹⁸

Wetlands are comprised of hydrophytic vegetation, hydric soils, and wetland hydrology. All three of these criteria need to be met for a place to be considered a wetland. Hydric soils are formed through saturation, flooding, or ponding for long enough to develop anaerobic conditions. They need to be saturated enough to support the growth and reproduction of hydrophytic vegetation, which are plants that have become accustomed to low-oxygen from prolonged saturation. Hydric soils, which have natural vegetation, should be able to support wetland plants, while hydric soils that were converted to other uses should be able to be restored for use in wetlands.¹⁹ **Appendix C** identifies hydric soil ratings for each soil series in Edison Township.

These ratings indicate the percentage of the individual map units that meet the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric soil. Map units that are made up predominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up predominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component.

Soils that have a 100% hydric rating make up a total of 2,567 acres or 13.1% of soils in Edison. Soils which meet 100% of the criteria for hydric soil in Edison include:

- Carlisle-Adrian mucks, 0 to 2 percent slopes, frequently flooded
- Manahawkin muck, 0 to 2 percent slopes, frequently flooded
- Parsippany silt loam, 0 to 3 percent slopes, frequently flooded
- Parsippany very poorly drained variant silt loam, 0 to 3 percent slopes, rarely flooded
- Pawcatuck-Transquaking complex, 0 to 2 percent slopes, very frequently flooded

Agricultural Soils

The NRCS identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. Localized conditions determine whether soils qualify as *prime, statewide, unique, or non-prime* agricultural soils. For instance, soils located in frequently flooded areas are less able to hold nutrients or support the root systems of some crops, making them less suitable for agricultural production than soils in drier locations. Soils on steep slopes are more easily eroded and less productive than soils on flat ground. Depth to bedrock, or fragipan, may limit the root systems of certain crops, making deeper soils more appropriate for intensive field crops such as vegetables and shallower soils more appropriate for less intensive uses, such as pastures.

Following are the NRCS descriptions for *prime farmland, farmland of statewide importance, farmland of unique importance, and non-prime farmland*:

- *Prime farmland soils* rest on land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. They have the quality, growing season, and moisture supply to sustain high yields when managed

according to acceptable farming methods. Prime soils are not heavily eroded or saturated for a long period of time, and they either do not flood frequently or are protected from flooding.

- *Farmland soils of statewide importance* are nearly prime, producing high yields of crops when treated and managed according to acceptable farming methods. Some may produce yields that are as high as prime soils if conditions are favorable.
- *Unique soils* exhibit specific qualities that may be favorable to the production of specialized crops, such as blueberries or cranberries.
- *Other soils (or non-prime farmland)* encompass all soil types that are not classified as prime, statewide important, unique, or locally important. The capacity of these soils for supporting agriculture should be assessed on a site-specific basis. This category also includes areas of water.

Nearly a third (31%) of the soils in Edison are mapped as farmland. (*Table 4* and *Appendix D*)

Table 4. Soil Rated for Agricultural Use		
Arability Potential	Acres in Edison	Percent of Edison
Prime farmland	3,480.86	17.8%
Farmland of statewide importance	861.18	4.4%
Farmland of unique importance	1,670.84	8.5%
Farmland of local importance	71.09	0.4%
Not prime farmland	13,141	67%
Water	375	1.9%
Total:	19,597.5	100%
<i>Source: NRCS Web Soil Survey</i>		

Erodibility

Soils can be categorized by their susceptibility to erosion, the natural process by which wind, moving water, ice, and gravitational forces cause soil and particulate materials to be displaced. While erosion of exposed bedrock occurs over an extended time scale, soil erosion can occur more acutely with more immediate consequences. The soil's consistency determines its erosion potential, with dense, compact, clayey soils being less susceptible and looser loamy soils, with varying levels of clay and sand being more susceptible. The K-Factor looks at the soil texture and composition as well as the permeability to determine a number between 0.02 (less susceptible) and 0.69 (more susceptible) that demonstrates the erosion potential for a particular soil. In Edison, the soil K-values range from 0.02 to 0.37. (*Appendix E*)

The Erosion Hazard for road/trail soils measures the soil loss from unsurfaced roads and trails. It is determined using K-factor, slope, and content of rock fragments. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Table 5 shows the percentage of soil in Edison classified as having moderate, slight, and severe erosion hazard road/trail rating, and *Appendix F* provides the details on each soil type.

Table 5. Erodibility in Edison		
Erosion Hazard Road/Trail Rating	Acres	% of Rated Land
Moderate	7,976.7	40.7%
Slight	7,817.2	39.9%
Severe	379.8	1.9%
Null or Not Rated	3,441.5	17.5%
Totals:	19,615.2	100.0%
<i>Source: NRCS Web Soil Survey</i>		

Limitations for Use

Other characteristics of soil that determine suitability for development, including its capacity to support foundations without corrosion, limits for septic systems, and hydrological characteristics such as a tendency towards ponding and flooding, a shallow water table or potential for frost heave, can contraindicate development. The USDA Bureau of Chemistry and Soils states,

“Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes soil poorly suited to basements or underground installations.”²⁰

Limitations for use include the following characteristics, and *Appendix G* includes the details for each of the soil series in Edison Township.

Depth to restrictive layer is the vertical distance from the soil surface to the upper boundary of the restrictive layer. The restrictive layer is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or restrict roots, or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. Information on the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation, can be obtained for specific soil types from the NRCS.

Drainage refers to the relative wetness of the soil under natural conditions as it pertains to wetness due to a water table. Drainage classes refer to the frequency and duration of wet periods under conditions like those under which the soil developed. Drainage classes range from excessively drained (water is removed very rapidly, and the soils are commonly coarse-textured or shallow) to very poorly drained (water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season and unless artificially drained, most crops cannot be grown).

Capacity [of most limiting layer] to transmit water refers to the ease with which pores in a saturated soil transmit water. This capacity is considered in the design of soil drainage systems and septic tank absorption fields.

Depth to water table indicates a range of expected depth to a saturated zone in the soil, known as a “water table,” that occurs during several months in most years. A saturated zone that lasts for less than a month is not considered a water table.

Flooding is the temporary inundation of an area caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

- “None” means that flooding is not probable. The chance of flooding is nearly 0% in any year. Flooding occurs less than once in 500 years.
- “Very rare” means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1% in any year.
- “Rare” means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1-5% in any year.
- “Occasional” means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5-50% in any year.
- “Frequent” means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50% in any year but is less than 50% in all months in any year.
- “Very frequent” means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50% in all months of any year.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Frequency is expressed as none, rare, occasional, and frequent.

- “None” means that ponding is not probable.
- “Rare” that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 to 5% in any year).
- “Occasional” that it occurs, on the average, once or less in two years (the chance of ponding is 5-50% in any year).
- “Frequent” that it occurs, on the average, more than once in two years (the chance of ponding is more than 50% in any year).

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in centimeters of water per centimeter of soil for each soil layer. The capacity varies depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to

be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water available to plants at any given time.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well-drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

Septic limitations refer to the effectiveness of a soil type to manage a septic tank absorption field. Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tile or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. The most important soil properties that determine septic limitations are saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding. Stones and boulders, ice, and bedrock or cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Soil Limitations for Building Site Development

Edison Township has soils that are rated by the NRCS Web Soil Survey as having no limits, some limits, or many limits on their ability to support dwellings with or without basements and small commercial buildings. (*Appendix H*)

For these ratings, dwellings are defined as single-family houses of three stories or less and small commercial buildings are structures that are fewer than three stories high and do not have basements:

- For dwellings without basements and small commercial buildings, the foundation is assumed to consist of spread footing of reinforced concrete built on undisturbed soil at a depth of 2 feet or at a depth of maximum frost penetration, whichever is deeper.
- For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built in undisturbed soil at a depth of about 7 feet.

The ratings for dwellings are based on the soil properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding and flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Properties that affect excavation and construction costs are depth to a water table, ponding and flooding, slope, depth to bedrock or cemented pan, hardness of bedrock or cemented pan, and the amount and size of rock fragments.²¹ The ratings are as follows:

Not Limited: indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected.

Somewhat Limited: indicates that the soil has features that are moderately favorable for specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected.

Very Limited: indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

For the breakdown of these ratings for each soil type and their total acreage found throughout the Township, see *Appendix H*.

Limitations for Recreational Use

Camp areas require preparation, which including shaping and leveling parking and tents, stabilizing roads and frequently used areas, and installing sanitary facilities and utility lines. Areas for camping often incur foot traffic and some motor traffic. Picnic areas incur heavy foot traffic and limited motor traffic, as there are parking spots outside park areas. Playgrounds need level soil that is free of stones and that can stand heavy foot traffic. *Appendix I* identifies the major soils in Edison and their limitations for recreational land. The value columns indicate a value from 0.01 to 1, with a larger value indicating more limitations. There are multiple values, each relating to the limiting factors.



Land Use

In past decades, land use trends have shown an increase in development and urban land cover. According to the *Land Use Environmental Trends Report* (2017) completed by the NJDEP, “an important parameter of land use and land cover is the amount of urban land in the state. Urban land includes both land with houses, buildings and pavement, and other areas that are essentially impervious to infiltration of rainfall.”

Two major studies have been used to determine long-range land use and land cover trends in New Jersey. In 1986, the NJDEP began a detailed study of status and trends in land use and land cover. Updates have been completed using aerial imagery from 1995, 2002, 2007, and 2012. From 1986 to 2012, there was an increase of almost 350,000 acres of development statewide. Rutgers University Center for Remote Sensing and Spatial Analysis (CRSSA) studied satellite data from 1972 to 2001 in New Jersey. In the 29 years, there was a total increase of developed land of 600,000 acres. Currently, the two most limiting factors to development in the state are water supply and wastewater demand.²²

Since 1986, the NJDEP has mapped land use within the state through their Land Use/Land Cover (LU/LC) data sets. Areas are delineated using color infrared images. The latest update of this data was released in 2015.

Land Cover

The NJDEP identifies six LU/LC categories: agriculture, barren land, forest, urban, and wetlands. Forested areas represent approximately 7% of Edison Township’s land cover, providing critical habitat for wildlife. Wetlands account for approximately 14%, and urban land represents 74% of Edison Township’s land cover. Together, wetlands, rivers, and streams provide riparian corridors, which are a different type of habitat for wildlife species.

Over the past four decades, land use in Edison Township has not changed dramatically. Wetlands decreased by 3.3% from 1986 to 2015. Urban land use increased by 4.3%. There has only been a 0.05% decrease in forested land cover. (***Table 6, Map 6***)

Type	1986		2015	
	Acres ^a	Percent	Acres	Percent
Agriculture	63.83	0.33%	24.60	0.13%
Barren Land	730.05	3.73%	468.16	2.39%
Forest	1,370.97	7.00%	1,362.55	6.95%
Urban	13,572.40	69.29%	14,433.25	73.60%
Water	381.75	1.95%	490.47	2.50%
Wetlands	3,469.82	17.71%	2,832.27	14.44%
Total:	19,588.81	100%	19,611.30	100%

Source: Land Use/Land Cover 1986, Land Use/Land Cover 2015, NJDEP

Land Use Types

Urban

Urban land cover is categorized by landscape influenced by human activity. This category includes residential, commercial, transportation, industrial complexes, and recreational land. Urban land use is the most abundant land use in Edison Township. Currently, 32%, or 4,628 acres, of the urban land is identified as residential, single unit, medium density. The second most common urban land type is industrial, which is 15% of total urban land or 2,217 acres. Urban land impacts the amount of impervious cover within the Township. In 2015, urban land consisted of 74% or 14,433 acres. (*Table 7*)

Classification	Acres	% of Category	% of Edison Township
Athletic Fields (Schools)	194.55	1.35%	0.99%
Commercial/Services	1,688.87	11.70%	8.67%
Industrial	2,217.32	15.36%	11.31%
Mixed Urban or Built-Up Land	3.60	0.02%	0.02%
Other Urban or Build-Up Land	950.97	6.59%	4.85%
Recreational Land	744.46	5.16%	3.80%
Residential, High Density or Multiple Dwelling	1,425.67	9.88%	7.27%
Residential, Rural, Single Unit	211.45	1.47%	1.08%
Residential, Single Unit, Low Density	1,137.90	7.88%	5.80%
Residential, Single Unit, Medium Density	4,628.00	32.06%	23.6%
Stormwater Basin	72.18	0.50%	0.37%

^a Unless noted otherwise, acreage is determined using the ArcGIS 10.8 digital mapping software.

Table 7. Urban Land Classifications			
Classification	Acres	% of Category	% of Edison Township
Uplands Rights-of-Way Developed	120.62	0.84%	0.62%
Uplands Rights-of-Way Undeveloped	45.73	0.32%	0.23%
Transportation/Communication/Utilities	212.67	1.47%	1.08%
Industrial and Commercial Complexes	3.84	0.03%	0.02%
Railroads	171.69	1.19%	0.88%
Major Roadways	498.25	3.45%	2.54%
No Longer Military	92.32	0.64%	0.47%
Mixed Transportation Corridor Overlap Area	1.02	0.01%	0.01%
Heliports	1.30	0.01%	0.01%
Stadium, Theaters, Cultural Centers and Zoos	4.72	0.03%	0.02%
Cemetery	6.14	0.04%	0.03%
Total:	14,433.25	100.00%	73.60%

Source: Land Use/Land Cover 2015, NJDEP

Barren Land

The subcategories of barren land identified in Edison Township include altered lands, beaches, and transitional lands. Included are residential, commercial, and industrial areas under construction, areas under construction for unknown use, and abandoned structures. Barren land represents 2% of the Township’s total area. As reported in the *2018 Open Space and Recreation Plan*, there are 245 acres of landfills located off Mill Road in the Township. The largest landfill is 110 acres and is owned by ILR; Industrial Land Reclaiming, Inc.²³ Barren land decreased 1.3% since 1986. (*Table 8*)

Table 8. Barren Land Use			
Classification	Acres	% of Category	% of Edison Township
Altered Lands	252.72	57.44%	1.29%
Transitional Areas	184.31	41.89%	0.94%
Undifferentiated Barren Lands	2.93	0.67%	0.01%
Total:	439.96	100%	2.24%

Source: Land Use/Land Cover Data 2015, NJDEP

Forest

Forestland includes any lands covered by woody vegetation other than wetlands. These areas can produce timber and other wood products and support outdoor recreation. Forested land benefits air quality, water quality, wildlife habitat, and climate. There are several different types in Edison:

- Deciduous Forest
- Coniferous Forest
- Mixed Forest
- Brush/Shrubland

According to the 2015 LU/LC data, 6.95% of Edison is forested lands, totaling 1,362 acres. (**Table 9**) The largest stands are in the Plainfield Country Club, Edith Stevens Memorial Wildlife Preserve, Thomas A. Edison Park, Roosevelt Park, as well as several smaller parks and green spaces in the Township.

Table 9. Forested Land			
Classification	Acres	% of Category	% of Edison Township
Deciduous Forest (10-50% Crown Closure)	205.17	15.06%	1.05%
Deciduous Forest (>50% Crown Closure)	723.11	53.07%	3.69%
Coniferous Forest (10-50% Crown Closure)	2.87	0.21%	0.02%
Mixed Forest (>50% Deciduous, 10-50% Crown Closure)	5.75	0.42%	0.03%
Old Field (<25% Brush Covered)	118.56	8.7%	0.60%
Deciduous Brush/Shrubland	169.41	12.43%	0.86%
Coniferous Brush/Shrubland	13.91	1.02%	0.07%
Mixed Deciduous/Coniferous Brush/Shrubland	123.66	9.08%	0.63%
Phragmites Dominate Old Field	0.10	0.01%	0%
Total:	1,362.55	100%	6.95%
<i>Source: Land Use/Land Cover 2015, NJDEP</i>			

Deciduous Forest

Deciduous trees are those who lose their leaves at the end of the growing season. These trees remain leafless throughout the winter and sprout new leaves the following spring. The average height of the stand is at least 20 feet. A forest stand must have at least 75% canopy coverage from deciduous trees species to be placed in this category. In Edison Township, there are 928 acres of deciduous forest.

- *Deciduous Forest, 10-50% Crown Closure:* This category contains deciduous forest stands that have crown closure greater than 10% but less than 50%.
- *Deciduous Forest, >50% Crown Closure:* This category contains deciduous stands with crown closure greater than 50%. Crown closure is the percentage of forest area occupied by the vertical projections of tree crowns. Crown closure percentages provide a reasonable estimate of stand density. Most of the deciduous forests in New Jersey are in this category.

Coniferous Forest

Coniferous species are those trees commonly known as evergreens. They do not lose their leaves (needles) at the end of the growing season but retain them through the year. Conifers can easily be distinguished from deciduous trees on wintertime color infrared photography because of their high infrared reflectance due to their leaf retention. The stand must be 20 feet high and must be stocked by at least 75% conifers to be labeled as a coniferous stand.

- *Coniferous, 10-50% Crown Closure:* This category contains natural coniferous stands with crown closure >10%, but less than 50%.

Mixed Forest

When neither coniferous nor deciduous trees represent 75% or more of the forested area, it is classified as Mixed Forest. This category is further broken down according to which type is 50% or greater in prevalence, conifers or deciduous trees, and the extent of crown closure.

- *Mixed Forest (>50% Deciduous with 10-50% Crown Closure)*: Mixed forests of all types represent a low percentage of Edison Township’s land area, covering only 0.03% of Edison’s total land cover and making up 0.42% of the forested land category.

Brush/Shrubland

When the vegetation is less than 20 feet high, the area is categorized as brush/shrubland:

- *Deciduous Brush/Shrubland*: This category contains natural forested areas with deciduous species less than 20 feet in height. An area must have greater than 25% brush cover to be placed in this category. This category can also contain inactive agricultural areas that have grown over with brush.
- *Coniferous Brush/Shrubland*: This category contains natural forested areas with coniferous species less than 20 feet in height. An area must have greater than 25% brush cover to be placed in this category. This category can also contain inactive agricultural areas that have grown over with brush.
- *Mixed Deciduous/Coniferous Brush/Shrubland*: Natural forested areas less than 20 feet high with a mixture of coniferous and deciduous trees.
- *Old Field*: This category includes open areas that have less than 25% brush cover. The predominant types are grasses, herbaceous species, tree seedlings, and or saplings. Old fields are distinguished from inactive farmland by the amount of brush cover.
- *Phragmites Dominate Old Field*: This category contains herbaceous vegetation in upland vegetation settings dominated by *Phragmites australis*. Phragmites is an invasive grass species that is tall, six feet or more in height, and grows rapidly, choking out native species in the process. Phragmites typically grow in large, homogenous stands and have a feathery seed head.

Water

All areas that are periodically water covered are included in this category. Water represents 2.5%, or 490 acres, of Edison’s total land area, with 0.3%, or 67 acres, identified as artificial lakes. (**Table 10**) Water within the Township increased 109 acres from 1986 to 2015.

Classification	Acres	% of Category	% of Edison Township
Artificial Lakes	67.35	13.73%	0.34%
Natural Lakes	7.58	1.55%	0.04%
Bridge Over Water	0.089	0.02%	0%
Streams and Canals	20.20	4.12%	0.10%
Tidal Rivers, Inland Bays, and Other Tidal Waters	395.26	80.59%	2.02%
Total:	490.47	100.00%	2.50%

Source: Land Use/Land Cover 2015, NJDEP

Wetlands

Wetlands are defined as areas saturated by ground and surface waters at a frequency and duration sufficient to support vegetation adapted for life in saturated soil conditions. The wetlands of New Jersey are located around the numerous interior stream systems and along coastal rivers.

According to the 2015 land use data, wetlands in Edison Township occupy 14%, or 2,832 acres, of the total area. (**Map 7**) Wetland areas in Edison are located within Dismal Swamp, along the riparian corridors, and in the floodplain of the Raritan River.

Deciduous wooded wetlands account for 45%, or 1,264 acres, of the wetlands in Edison (6% of the Township). (**Table 11**) Deciduous wooded wetlands are closed canopy swamps dominated by deciduous trees normally associated with watercourses, edges of marshes, and isolated wetlands. Wetlands within the Township have decreased by 3.3%, or 818 acres, from 1986 to 2015.

Table 11. Wetlands in Edison Township			
Classification	Acres	% of Category	% of Edison Township
Deciduous Wooded Wetlands	1264.03	44.63%	6.45%
Mixed Wooded Wetlands (Deciduous Dom.)	2.23	0.08%	0.01%
Deciduous Scrub/Shrub Wetlands	115.91	4.09%	0.59%
Coniferous Scrub/Shrub Wetlands	1.32	0.05%	0.01%
Disturbed Wetlands (Modified)	39.28	1.39%	0.20%
Agricultural Wetlands (Modified)	7.50	0.26%	0.04%
Phragmites Dominate Interior Wetlands	85.14	3.01%	0.43%
Phragmites Dominate Coastal Wetlands	685.97	24.22%	3.5%
Saline Marsh (High Marsh)	73.55	2.60%	0.38%
Saline Marsh (Low Marsh)	209.57	7.40%	1.07%
Managed Wetland in Built-Up Maintained Rec Area	40.12	1.42%	0.20%
Managed Wetland in Maintained Lawn Greenspace	41.32	1.46%	0.21%
Wetland Rights-of-Way	41.08	1.45%	0.21%
Mixed Scrub/Shrub Wetlands (Deciduous Dom.)	94.91	3.35%	0.48%
Mixed Scrub/Shrub Wetlands (Coniferous Dom.)	7.23	0.26%	0.04%
Herbaceous Wetlands	123.13	4.35%	0.63%
Total:	2832.27	100.00%	14.44%
<i>Source: Land Use/Land Cover 2015, NJDEP</i>			

Agriculture

Agriculture includes all lands used primarily to produce food and fiber and the structures associated with this production. About one-tenth of the land cover in Edison Township is agricultural. Nearly 64% of this is used for orchards, vineyards, nurseries, and horticultural areas, while 36% is utilized for other agriculture. Between 1986 and 2015, agricultural lands within the Township decreased by 0.2% (or 39 acres). (**Table 12**).

Table 12. Agricultural Lands			
Classification	Acres	% of Category	% of Edison Township
Orchards/Vineyards/Nurseries/Horticultural Areas	15.85	64.43%	0.08%
Other Agriculture	8.76	35.61%	0.04%
Total:	24.61	100%	0.13%
<i>Source: Land Use/Land Cover Data 2015, NJDEP</i>			

Preserved Open Space

Preserved open space represents approximately 9%, or 1,771 acres, of the Township’s land area, with 6% permanently preserved on the Township’s Recreation and Open Space Inventory (ROSI) through the NJDEP Green Acres Program (*Table 13*). *Map 1* illustrates these preserved open space parcels. The largest of these properties is the Dismal Swamp Preserve, totaling 304 acres. Major municipal parks include Tingley Lane Park, Oak Tree-Stephenville Park, Stevens Preserve, Papaiani Park, Oakcrest Swim Club, and Kilmer Fields.²⁴

In 2020, Middlesex County purchased 13.18 acres in Edison using grant funds from the National Park Service American Battlefield Protection Program. This purchase preserves the Metuchen Meeting House Battlefield, a Revolutionary War site adjacent to the Township’s Edith Stevens Memorial Wildlife Park.²⁵

Table 13. Preserved Open Space	
Classification	Acres
Municipal Open Space (ROSI)	1,169.74
Municipal Open Space (ROSI addition)	33.77
State Parks and Open Space	71.46
Middlesex County Parks	397.04
Union County Parks	34.85
Non-Profit Preserved Land	5.01
Deed Restricted Forested Wetlands	59
Total Preserved Land:	1,770.87 acres
<i>Source: Edison Township Open Space and Recreation Plan Update</i>	



Plant Communities

The NJDEP maps critical habitat for imperiled and priority species through the Landscape Project, which is a proactive, ecosystem-level approach to the long-term protection of these habitats, rare plant species, and ecological communities through the Natural Heritage Database. The greatest threats to forests in New Jersey are development, fragmentation, and invasive plant species.

Edison Township is in the Piedmont Physiographic Province and the inner Coastal Plains Physiographic Province. The Piedmont is characterized by rolling terrain, underlain by sedimentary rocks, while the Coastal Plains are characterized by relatively flat terrain underlain by sands and gravel.²⁶ **Table 14** lists the ecological communities that are typically found within these physiographic provinces.

Table 14. Terrestrial Ecological Communities of the Piedmont and Inner Coastal Plain	
Piedmont	Inner Coastal Plains
<ul style="list-style-type: none"> • Chestnut oak forest • Northern mixed oak forest • Hemlock-mixed hardwood forest • Sugar maple-mixed hardwood forest • Hardwood swamp • Emergent marsh • Grass-sedge marsh • Shrub swamp • Pond shore • Successional communities 	<ul style="list-style-type: none"> • Southern mixed oak forest • Upland pine forest • Beech-oak forest • Red maple-sweet gum forest • Virginia pine successional forest • Coastal white cedar swamp • Hardwood swamp • Emergent marsh • Freshwater tidal marsh • Successional communities
<i>Source: Plants of Southern New Jersey</i>	

Rare Plant Species

The state of New Jersey keeps records of rare plants and ecological communities in the New Jersey Natural Heritage Database²⁷. The New Jersey Natural Heritage Program collects data for every county across New Jersey. *Appendix J* lists the rare plants and ecological communities for Middlesex County, where Edison Township is located.

The NJDEP identifies and maps areas which are considered unique ecosystems and are known as the Natural Heritage Priority sites (NHP). Edison Township does not contain any Natural Heritage Priority sites.

Municipal Ordinances

Removal of trees may result in increased soil erosion, decreased soil fertility, increased dust and mosquito presence, and property value depreciation. Trees have a high return on investment due to ecosystem services. Trees and greenspace provide direct and indirect benefits, such as reducing stormwater runoff, reducing air and water pollution, reducing energy costs and use associated with heating and cooling, reducing the urban heat island, protecting roadways, and reducing the amount of asphalt sealers required, reducing noise pollution, and providing carbon storage and sequestration. There are several municipal ordinances in Edison which protect vegetation and ecological communities.

Tree Protection Ordinance

Beginning in 1999, Edison Township developed several ordinances to ensure tree protection in the Township. These ordinances include requirements for tree removal, silviculture and timber harvesting, tree replacement, shade trees, tree planting, and preservation standards, and a municipal tree fund.²⁸ The tree protection ordinance in Edison was approved as a sustainability action by Sustainable Jersey in 2017.²⁹

Shade Tree Ordinance

The municipal code establishes protections and requirements for shade trees throughout the Township.³⁰ For street and parking areas, the ordinance requires “one (1) shade tree to be planted for every fifty feet of frontage on proposed right-of-way.” Shade trees are required to be planted around parking area perimeters for off-street parking of ten vehicles or more. The types of trees and their location must be submitted to the Planning Board or Zoning Board of Adjustment in conjunction with the application of development.

Edison Tree Fund

Edison Township established a Township Tree Fund to support tree planting projects throughout the community.³¹ Contributions made in lieu of tree replanting will be deposited into the fund. The ordinance calls for the following measures:

- The funds shall be used to improve parks, natural landscapes, retaining walls, landscape irrigation systems, park benches, bollards, landscape lighting (excluding sport event lighting), pathways and playground equipment; and
- The planting of trees or other landscaping in public parks, property surrounding public buildings, and rights-of-way.



Wildlife Communities

Critical Habitat

The NJDEP Landscape Project 3.3 ranks patches of habitat using a numeric system (0 through 5) for the purpose of identifying habitat, which may be suitable for threatened and endangered species. Habitat identified as Rank 3 through 5 are considered environmentally significant by the NJDEP:

- **Rank 5:** Species-specific patches containing one or more occurrences of wildlife listed as endangered and threatened pursuant to the *Federal Endangered Species Act of 1973*.
- **Rank 4:** Species-specific patches with one or more occurrences of *State Endangered* species.
- **Rank 3:** Species-specific patches containing one or more occurrences of *State Threatened* species.
- **Rank 2:** Species-specific patches containing one or more occurrences of species considered to be *Species of Special Concern*.
- **Rank 1:** Species-specific patches that meet habitat-specific suitability requirements such as minimum size criteria for endangered, threatened, or priority wildlife species, but that do not intersect with any confirmed occurrences of such species.
- **Rank 0:** Species-specific patches that do not contain any species occurrences and do not meet any habitat-specific suitability requirements.

According to the NJDEP Landscape Project, Edison Township contains habitat patches Rank 1 through Rank 4 (state endangered species). There are no patches in Edison which are suitable for federally threatened or endangered species. The majority of critical species habitat is Rank 1 (44%), or patches that meet habitat-specific suitability requirements. Areas containing habitat of Ranks 1, 2, and 3 are dispersed throughout the Township, mostly found along waterways and streams. Slightly less than 10% of the Township is listed as Rank 4, or patches where a state-listed endangered species has been observed. These areas are found around Bound Brook, Ambrose Brook, South Branch Rahway River, and Coppermine Brook on the western border of the Township.

Other critical habitat areas in Edison identified by the Landscape Project include Roosevelt Park and Edison State Park, which contain habitat patches with species of special concern as well as meet the suitability requirements for endangered, threatened, or priority wildlife species. Roosevelt Park and Edison State Park consist primarily of wooded areas, meadows, and small bodies of water.

A summary of habitat patches within Edison Township is outlined in **Table 15**, and their distribution within the Township is displayed in **Map 8**. Dismal Swamp Preserve contains patches with state threatened species, state endangered species, and species of special concern. The Bound Brook waterway and its surrounding area provide habitat for state threatened and endangered species.

Table 15. Critical Habitat in Edison Township			
Rank	Acres	% of Rank	% of the Township
1	2,325.32	44.02%	11.86%
2	720.07	13.63%	3.67%
3	409.83	7.76%	2.09%
4	1,827.01	34.59%	9.32%
Total:	5,282.23	100%	26.93%
<i>Source: NJDEP Landscape Project</i>			

Threatened and Endangered Species

There are four state endangered species in Edison Township. These species are the Peregrine Falcon, the Pied-Billed Grebe, the Northern Harrier, and the Bald Eagle. There are seven state threatened species in Edison Township, including the American Kestrel, the Cattel Egret, the Grasshopper Sparrow, the Osprey, the Savannah Sparrow, the Yellow-Crowned Night-Heron, and the Wood Turtle. There are also seven species of special concern, including the Snowy Egret, the Cooper’s Hawk, the Glossy Ibis, the Great Blue Heron, the Little Blue Heron, the Wood Thrush, and the Eastern Box Turtle.

A full list of these species can be found in **Appendix K**.

Potential Vernal Habitat

The Township of Edison is home to several potential vernal habitats, also referred to as vernal pools. These natural wetland depressions fill with water during the rainy season in fall and remain ponded until the dry weather in early summer causes them to dry out. The vernal pools provide habitat for amphibians, reptiles, invertebrates, and many species of wetland vegetation but cannot support fish populations because of the pools’ brief dry period. Certain wildlife species, referred to as “obligate” vernal pool breeders, have evolved with reliance upon these fish-free breeding sites and cannot successfully reproduce elsewhere. Other wildlife species, referred to as “facultative” vernal pool species, also take advantage of vernal habitats for

breeding and or feeding purposes but are not limited to performing these functions solely in vernal pools.

The NJDEP defines a vernal habitat in the Freshwater Wetlands Protection Act Rules (*N.J.A.C. 7:7A-1.4*) as a wetland that meets the following criteria:

1. The wetland must consist of or contain a confined basin or depression without a permanently flowing outlet;
2. The pool must feature evidence of breeding by at least one obligate or two facultative vernal habitat species (these species are identified in *N.J.A.C. 7:7A, Appendix I*);
3. The area must maintain ponded water for at least two continuous months between March and September of a normal rainfall year, and;
4. The area must remain free of fish populations throughout the year, or it must dry up at some time during a normal rainfall year.

Wetland areas featuring a confined basin depression exhibiting the hydrologic and biological criteria established above are said to meet “certification” requirements and may be referred to as “certified vernal habitats” or simply “vernal habitat areas.” The NJDEP maps both certified “vernal habitat areas” and “potential vernal habitat areas” using New Jersey’s Landscape Project (<http://www.nj.gov/dep/gis/geoweb splash.htm>). The mapping depicts a 300-meter radii circle over the estimated center of both “certified” and “potential” vernal habitats. The 300-meter buffer is intended to account for the varying sizes of individual pools, the likely presence of adjacent wetland areas, and the adjacent dispersal habitats typically utilized by many resident amphibian species.

The Landscape Project defines its mapping of vernal habitats as follows:

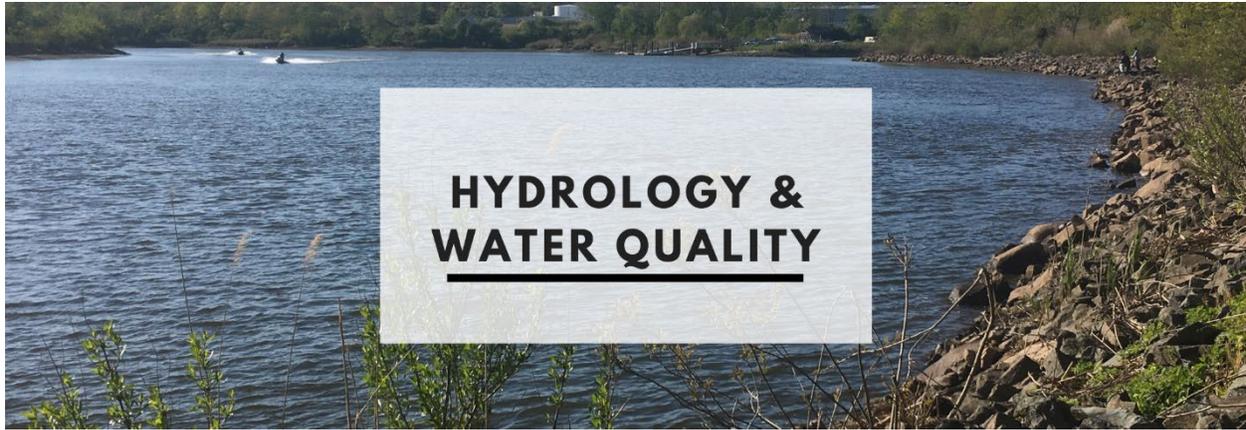
- **Potential vernal habitat area** – These are areas identified as possibly containing a vernal pool that meets the criteria of a “vernal habitat” pursuant to N.J.A.C. 7:7A-1.4. These sites include sites that have been field inspected and have been found to meet the physical characteristics of a vernal habitat, but for which biological criteria have not yet been measured, as well as sites that have not been checked by NJDEP staff.
- **Vernal habitat areas** – These are areas that contain pools that have been field-verified by the NJDEP and have been determined to meet both the physical and biological characteristics of a vernal habitat in accordance with N.J.A.C. 7:7A-1.4. The Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A) protects vernal habitats as wetland areas requiring a 50-foot buffer or a 150-foot buffer if the pool supports a State threatened or endangered species.

In Edison Township, the Landscape Project mapping identified six separate potential vernal habitat polygons, totaling 864 acres of potential vernal habitat. There are three identified vernal habitat areas in the Township, totaling 387 acres. (*Map 9*) There are several more locally known and identified vernal ponds in the woods east of Menlo Park School, around James Madison School, behind Woodrow Wilson School, and in the Stevens Preserve area.³²

Vernal habitats and potential vernal habitats are in the northern half of Edison. Vernal habitats exist on both the east and west banks of Bound Brook, where it crosses the western municipal boundary from South Plainfield Borough into Edison. Some potential vernal habitats are identified surrounding Bound Brook’s tributaries, as well as surrounding Robinsons Branch where it passes through Edison’s northern municipal boundary with Scotch Plains Township.

Table 16 lists obligate and facultative fauna species found in vernal habitats. Some of these species *may be* present, but none are *confirmed* to be present within Edison Township’s potential vernal habitat areas. Descriptions of the 71 species of reptiles and amphibians found in New Jersey, including the obligate and facultative vernal pool species, can be found on the NJDEP Division of Fish and Wildlife website.³³

Table 16. Obligate and Facultative Fauna Species Found in Vernal Habitats in New Jersey		
Obligate Species	Facultative Species	
Marbled Salamander***	Snapping Turtle	Upland Chorus Frog
Blue-spotted Salamander*	Eastern Mud Turtle	Northern Cricket Frog
Jefferson Salamander***	Spotted Turtle***	New Jersey Chorus Frog
Eastern Tiger Salamander*	Eastern Painted Turtle	Bull Frog
Wood Frog	Red-spotted Newt	Green Frog
Eastern Spadefoot Toad	American Toad	Southern Leopard Frog
Fairy shrimp (order <i>Arnostraca</i>)	Fowler’s Toad***	Four-toed Salamander
	Pine Barrens	Northern Spring Peeper
	Treefrog**	Long-tailed Salamander**
	Northern Gray	Wood Turtle**
	Treefrog	
	Southern Gray	
	Treefrog*	
* <i>State Endangered</i> ; ** <i>State threatened</i> ; *** <i>Special concern</i> Source: NJDEP		



Hydrology & Water Quality

Aquifer Recharge

An aquifer is an underground formation of permeable rock or unconsolidated materials that can yield significant quantities of water to wells or springs.

Aquifers are typically equated to the type of geologic formation in which they exist. Aquifers in New Jersey are classified as either bedrock or surficial. Bedrock aquifers consist of rock formations, while surficial aquifers are formed from unconsolidated materials such as sand, gravel, or glacial sediment. Bedrock aquifers in the Piedmont contain water in fractures within the rock, while surficial aquifers contain water primarily in spaces between sand and gravel.³⁴

(Figure 4)

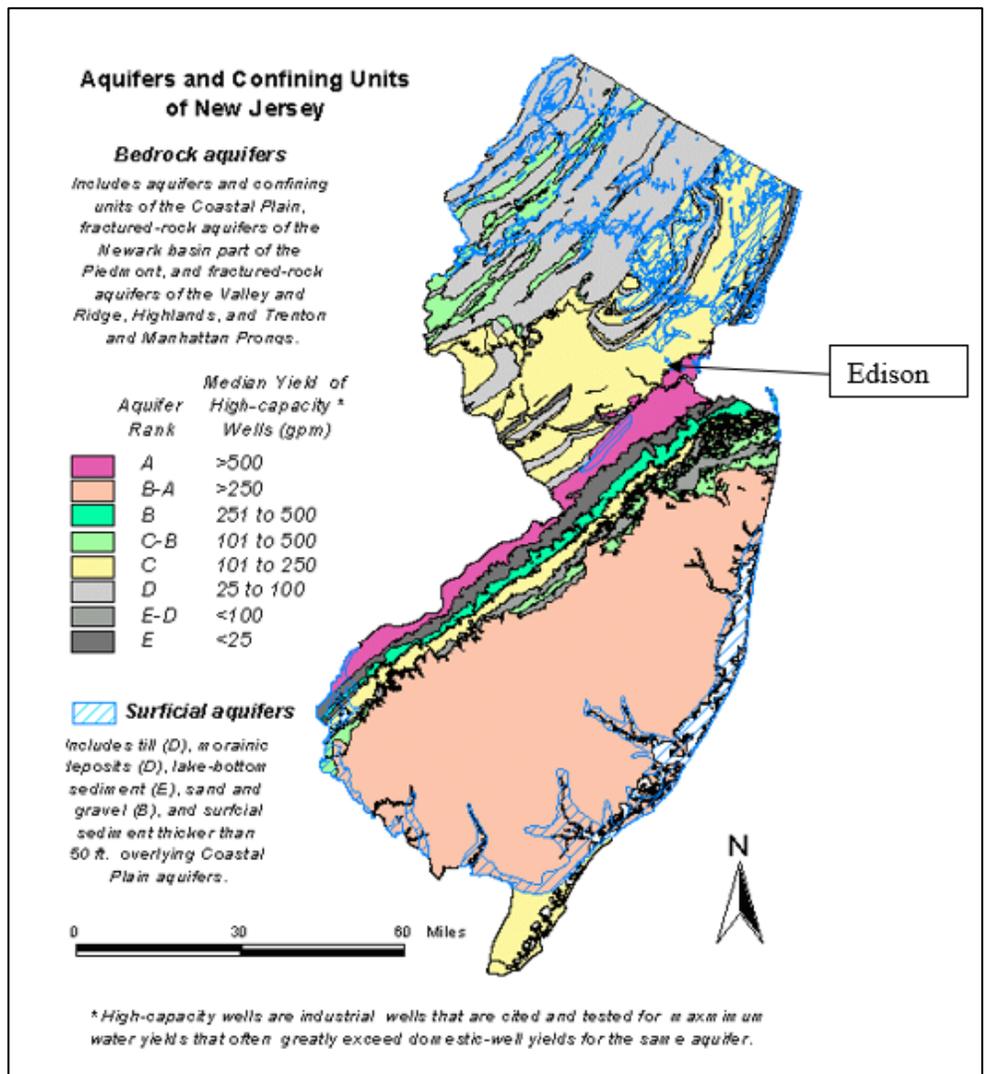


Figure 4. Aquifers and Confining Units of New Jersey

Edison contains bedrock aquifers of Rank A (Potomac-Raritan Magothy) and Rank C (Brunswick). (*Map 10*)

Rank A aquifers have a median yield of greater than 500 gallons per minute (gpm) for high-capacity wells. The median yield of high-capacity wells for a Rank C aquifer ranges from 100 to 250 gpm. (*Figure 5* and *Table 17*)

Figure 5. Ranking Values for Aquifers in New Jersey (NJGS)

Ranking Values for Aquifers and Confining Units in New Jersey		
Aquifer Rank	Median Yields (gpm)	
[A]	> 500	<p>Aquifers in New Jersey can be ranked on their ability to yield ground water to high-capacity wells. These wells include water-supply, irrigation, and industrial-supply wells sited and tested for maximum yield. Many of the wells have boreholes exceeding the standard six-inch diameter for domestic wells. The five aquifer-rank values (A,B,C,D,E) are based on a statistical analysis of median yields for over 8000 high-capacity wells. Median yield is the statistical value for which there are an equal number of wells yielding greater and lesser volumes of water. Each aquifer or confining unit is assigned a rank based on its median yield or professional judgement where data are lacking. More than one ranking value indicates that well-yield data were analyzed for several lithologies within a map unit and well yields may vary considerably due to lithologic and structural influences.</p>
[B]	> 250 to 500	
[C]	> 100 to 250	
[D]	25 to 100	
[E]	< 25	

Table 17. Bedrock Aquifers in the Township of Edison

Name	Rank	Acres	Percentage
Brunswick Aquifer	C	13,713.50	69.9%
Potomac-Raritan Magothy Aquifer	A	5,606.27	28.58%
Water Bodies		291.53	1.48%
Total:		19,611.30	100.00%
<i>Source: NJGS Aquifers of New Jersey 1998, NJDEP</i>			

Map 11 shows the potential for an aquifer to recharge an area in Edison Township. *Table 18* provides the average recharge estimated by the NJGS for Middlesex County for these aquifers.

Table 18. Middlesex County Aquifer Data (Summary)

Aquifer	Average Well Yield (Gallons/Minute)	Aquifer Rank
Brunswick (Passaic)	220	C
Farrington (Raritan)	531	A
Lokatong	131	D
Old Bridge (Magothy)	562	A

<i>Aquifer</i>	<i>Average Well Yield (Gallons/Minute)</i>	<i>Aquifer Rank</i>
Potomac, Raritan and Magothy (undifferentiated)	408	B
Stockton	224	C

Source: NJGS

Table 19 provides detailed information on the acreage of each aquifer recharge area in Edison Township. Aquifer recharge is the process by which rainwater seeps down through the soil into an underlying aquifer. The rate of recharge is not the same for all aquifers, and that must be considered when pumping water from a well. Pumping too much water too fast draws down the water in the aquifer and eventually causes a well to yield less and less water and to even run dry. Rates of recharge are estimated based on infiltration capacity, rainfall, and climate.

Aquifer Rank	Groundwater Rank	Numeric Rank	Alpha Rank	Acres (GIS)	% Township
A	B	12	B/A	501.17	2.60%
	C	13	C/A	58.90	0.31%
	D	14	D/A	560.85	2.90%
	E	15	E/A	1,656.26	8.58%
B	B	22	B/B	82.28	0.43%
	C	23	C/B	48.21	0.25%
	D	24	D/B	97.92	0.51%
	E	25	E/B	194.59	1.01%
C	A	31	A/C	132.06	0.68%
	B	32	B/C	2,529.01	13.10%
	C	33	C/C	3,977.63	20.60%
	D	34	D/C	1,921.35	9.95%
	E	35	E/C	1,691.65	8.76%
D	A	41	A/D	26.51	0.14%
	B	42	B/D	342.78	1.78%
	C	43	C/D	798.35	4.13%
	D	44	D/D	101.58	0.53%
	E	45	E/D	41.72	0.22%
E	B	52	B/E	2.23	0.01%
	D	54	D/E	7.32	0.04%
	E	55	E/E	28.64	0.15%
L	L	97	L/L	1,300.05	6.73%
W	W	98	W/W	3,200.29	16.57%
X	X	99	X/X	9.83	0.05%

Source: NJDEP NJGS

Watersheds

“A watershed is a topographic area within which surface water runoff drains into a specific point on a stream or to a water body such as a lake.”³⁵ A watershed-based approach to natural resource management is considered by state and national agencies to be the standard for managing complex environmental problems. The NJDEP has divided the state into Watershed Management Areas (WMAs) composed of multiple watersheds and sub-watersheds. The US Geological Survey (USGS) has mapped watersheds using hierarchical numbering systems using hydrological unit code (HUC) of up to 14 digits for the smallest watersheds. Edison Township falls within WMA 7, the Arthur Kill, and WMA 9, the Lower Raritan. *Map 12* and *Table 20* provide information on the location and amount of each sub-watershed in Edison Township.

WMA	WMA (Name)	Sub-Watershed	Watershed	Acres	Percent
09	Lower Raritan, South River, and Lawrence	Spring Lake Fork of Bound Brook	Raritan River Lower (Lawrence to Millstone)	169.69	0.87%
07	Arthur Kill	Robinsons Brook Rahway River (above Lake Ave.)	Rahway River / Woodbridge Creek	3,116.86	15.89%
07	Arthur Kill	Rahway River SB	Rahway River / Woodbridge Creek	2,278.36	11.62%
09	Lower Raritan, South River, and Lawrence	South Fork of Bound Brook	Raritan River Lower (Lawrence to Millstone)	3,092.21	15.77%
09	Lower Raritan, South River, and Lawrence	Ambrose Brook (above/including Lake Nelson)	Raritan River Lower (Lawrence to Millstone)	1,626.75	8.29%
09	Lower Raritan, South River, and Lawrence	Mill Brook / Martins Creek	Raritan River Lower (below Lawrence)	3,510.89	17.90%
09	Lower Raritan, South River, and Lawrence	Raritan River Lower (below Lawrence Brook)	Raritan River Lower (below Lawrence)	1,136.78	5.80%
09	Lower Raritan, South River, and Lawrence	Red Root Creek / Crows Mill Creek	Raritan River Lower (below Lawrence)	2,371.09	12.09%
09	Lower Raritan, South River, and Lawrence	Raritan River Lower (Lawrence Brook to Mile Run)	Raritan River Lower (Lawrence to Millstone)	2,308.66	11.77%

Source: NJDEP HUC14 Watershed Tabular Data

Surface Water Quality

Surface water is water that collects on the ground or in a stream, river, lake, wetland, or ocean. New Jersey's Surface Quality Standards (SWQS) (N.J.A.C. 7:9) classify Fresh Water 1 (FW1) as the highest level of classification, which is defined as:

“those fresh waters, as designated in N.J.A.C. 7:9B-1.15(j), that are maintained in their natural state of quality (set aside for prosperity) and not subject to any manmade wastewater discharges or increased runoff from anthropogenic activities. These waters are set aside for prosperity because of their clarity, color, scenic setting, other characteristics of aesthetic value, unique ecological significance, or *exceptional* fisheries resource(s).”³⁶

The general classification for other freshwater in the State is Fresh Water 2 (FW2). The presence of trout in a stream means that the waters are relatively free of chemicals or biological contaminants and is used to further define designated uses. A stream can be classified as Trout Production (TP), Trout Maintenance (TM), or Non-Trout (NT).

- Trout Production waters are designated “for use by trout spawning or nursery purposes during their first summer.”
- Trout Maintenance waters support trout throughout the year.
- Waters classified as Non-Trout do not support trout, either because of their physical nature or due to biological or chemical characteristics.
(SWQS, N.J.A.C.7:9B)

Ambrose Brook, Bound Brook, Coppermine Brook, Robinsons Branch, and the South Branch of the Rahway River are designated as FW2-NT waters.

Saline waters are classified as saline estuarine (SE) and saline coastal (SC). SE waters are further classified into SE1, SE2, and SE3 based on their designated uses. Edison Township has waters classified as SE1. In all SE1 waters, the designated uses are:

- Shellfish harvesting in accordance with N.J.A.C. 7:12;
- Maintenance, migration and propagation of the natural and established biota;
- Primary contact recreation; and
- Any other reasonable uses.
(N.J.A.C. 7:9B-1.12)

Black Ditch, Burt Creek, Crows Mill Creek, Martins Creek, Mill Brook, Red Root Creek, Rum Creek, South River, the Washington Canal, and the Raritan River are classified as FW2-NT/SE1 waters.

Waters are also classified by antidegradation standards into Outstanding Natural Resource Waters (ONRW – FW1 or Pinelands); Category One (C1) waters, which are protected from measurable changes in water quality characteristics as determined by their clarity, color, scenic setting, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resource(s); and Category Two (C2) waters, which all other waters that are not ONRW or C1. Like C1 waters, C2 waters are protected from any measurable change in existing water quality; however, some

lowering of existing water quality may be allowed by the NJDEP based on a social or economic justification. All waters in Edison are Category Two waters. (*Map 13* and *Table 21*)

Table 21. Surface Water Designations in Edison Township	
Designation	Name
FW2-NT	Ambrose Brook
FW2-NT	Bound Brook (and unnamed tributary)
FW2-NT	Coppermine Brook
FW2-NT	Lake Papaiani
FW2-NT	Robinsons Branch (and unnamed tributary)
FW2-NT	Roosevelt County Park Lake
FW2-NT	Rum Creek (unnamed tributary)
FW2-NT	South Branch Rahway River (and unnamed tributary)
FW2-NT/SE1	Black Ditch (unnamed tributary)
FW2-NT/SE1	Burt Creek
FW2-NT/SE1	Crows Mill Creek
FW2-NT/SE1	Martins Creek
FW2-NT/SE1	Mill Brook (and unnamed tributary)
FW2-NT/SE1	Raritan River (and unnamed tributary)
FW2-NT/SE1	Red Root Creek
FW2-NT/SE1	Rum Creek (and unnamed tributary)
FW2-NT/SE1	Silver Lake
FW2-NT/SE1	South River
FW2-NT/SE1	Washington Canal

Surface water quality is affected by point sources and non-point sources of pollution, as well as erosion and sedimentation. Point source means any discernible, confined, and discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft from which pollutants are or may be discharged.³⁷ This includes discharges from sewage treatment plants and factories, stormwater runoff, illegal dumping, and malfunctioning underground storage tanks and septic tanks. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

In contrast to point source pollution, non-point source pollution comes from many different sources. As rainfall or snowmelt moves over and through the ground, it picks up and carries natural and human-made pollutants (such as fertilizers, herbicides, and motor oil) and deposits them into surface and groundwater. The effects of pollutants on specific waterways can vary, but eventually, all are manifested into negative outcomes for drinking water supplies, recreation, fisheries, and wildlife. One of these effects is eutrophication, which, in freshwater systems, is the addition of substances, either man-made or natural, to a water body affecting the primary productivity of that body of water. Nitrates and phosphates promote excessive algae growth. These “blooms” can have negative effects on the ecosystem. This can include clouding of the water which limits sunlight penetration and stops the growth of plants deeper in the water.

Additionally, eutrophication can lead to anoxia, a condition where a water body has depleted oxygen levels – a result of the decomposition of dead phytoplankton.

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

Stream corridors can be protected by maintaining forested buffers; establishing protection measures for adjacent, environmentally sensitive lands; maintaining forest cover within the watershed through local ordinances; developing watershed plans, stream corridor restoration, and protection plans; and implementing open space design concepts in stormwater management.³⁸

Public Water Supply and Wellhead Protection

The 1986 Federal Safe Drinking Water Act Amendments (*Section 1428, P/L. 93-523, 42 USC 300 et. seq*) directed all states to develop a Well Head Protection Program (WHPP) Plan for both public community (CWS) and public non-community (NCWS) water supply wells. A component of the WHPP is the delineating of Well Head Protection Areas. This delineation is the first step in defining the sources of water to a public water supply to prevent and clean up groundwater contamination.

Wellhead Protection Areas (WPAs) are delineated for both public community and non-community wells. The delineations for these wells are two, five, and 12-year tiers. Each tier represents the horizontal extent of groundwater captured by a well pumping at a specific rate over those periods of time.

There are nine Public Community Water Supply wells in northwestern Edison, which are owned by the Middlesex Water Company. Public and community water supply wells in Edison are shown on **Map 14**.

The Township's water is purchased from the Raritan Water System and Middlesex Water Company. This water is sourced from surface water, which comes from the Millstone River, Raritan River, and the Delaware & Raritan Canal.³⁹ Groundwater is sourced from the New Brunswick aquifer.



Wetlands, Riparian Areas, Flood Zones

Wetlands

Wetlands are important natural resources that contribute significantly to an area’s social, economic, and environmental health. Among the services they provide are filtration of chemicals, pollutants, and sediment from water; flood control; critical habitat for wildlife; recreation and tourism. The NJDEP defines a freshwater wetland as “an area that is inundated or saturated by surface water or 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; provided, however, that the Department, in designating a wetland, shall use the three-parameter approach (that is, hydrology, soils, and vegetation) enumerated in the 1989 Federal Manual.”⁴⁰ (N.J.A.C. 7:7A). NJDEP has adopted this manual as the technical basis for identifying and delineating wetlands.

The NJDEP regulates virtually all activities in a wetland, including removing vegetation, filling, and placing obstructions. There may also be a transition area, or buffer, around the wetland that will require a waiver issued by the NJDEP for any activity within that zone. A wetland containing endangered species habitat would require a 150-foot-wide transition area, whereas a small wetland in a ditch might not require any transition area at all. Most freshwater wetlands require a 50-foot transition area. Wetlands in New Jersey are classified into three different values: exceptional resource value, ordinary resource value, or intermediate resource value.

Exceptional Resource Value Wetland

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

Ordinary Resource Value Wetland

- A freshwater wetland which does not exhibit any of the characteristics of an Exceptional Resource Value Wetlands, which is:

- An isolated wetland, as defined at N.J.A.C. 7:7A-1.4, which is:
 - Smaller than 5,000 square feet; and
 - Has the uses listed below covering more than 50% of the area within 50 feet of the wetland boundary. In calculating the area covered by a use, NJDEP will only consider a use that was legally existing in that location prior to July 1, 1988, or was permitted since that date:
 - Lawns,
 - Maintained landscaping,
 - Impervious surfaces,
 - Active railroad right-of-way,
 - Graveled or stoned parking/storage areas and roads,
 - A drainage ditch,
 - A swale or,
 - 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 wetlands under these rules, or classification of the body of water, as FW-1 or FW-2 trout production, to which it discharges.

Intermediate Resource Value Wetland

- A freshwater wetland of intermediate resource value is any wetland not defined as exceptional or ordinary.

According to the NJDEP’s 2015 Land Cover data, Edison Township has 2,832 acres of wetlands, occupying 14% of the Township. **Map 7** shows the types and locations of wetlands in Edison. Though this information is based on NJDEP mapped wetlands, unmapped wetlands, which are still subject to NJDEP regulation, may exist in Edison.

Wetlands are also regulated by the US EPA. Dismal Swamp, a preserved area in Edison Township containing primarily deciduous wooded wetlands, has Priority Wetlands status. According to the Edison Wetlands Association, “The Dismal Swamp serves as a natural oasis holding United States Environmental Protection Agency Federal Priority Wetlands status. The Dismal Swamp is home to over 175 species of birds and two dozen species of mammals, amphibians, and reptiles, as well as a dozen threatened and endangered species such as the American bittern, bald eagle, and spotted turtle. The Dismal Swamp also provides natural flood control, while its forests produce oxygen, and its wetlands clean and purify water.”⁴¹

The resource value of Dismal Swamp, situated in the northwest of Edison, includes 200 acres of palustrine forest, scrub-shrub, and emergent wetlands. The wetlands provide important resources for passerines, raptors, American woodcock, deer, squirrels, opossum, raccoon, and various small mammals. Threats to the wetlands include industrial and residential development.⁴²

The Raritan Center, located north of the Raritan River west of the Garden State Parkway, also includes priority wetlands. Red Root Creek Wetlands are owned privately by the Federal Business Center in the Raritan Center. Resource value includes 2,000 acres of palustrine forest, scrub-shrub, and emergent wetlands, ponds, and tidal creeks. Wetlands provide essential habitat

for waterfowl, shorebirds, colonial water birds, including the state listed yellow-crowned night-heron, raptors, passerines, furbearers, and anadromous fish in a highly urbanized area. Threats include destruction from numerous unauthorized fills and degradation of adjacent wetlands from erosion of fill material.

Riparian Zones

To better protect the public from hazards of flooding, preserve the quality of surface waters, and protect wildlife and vegetation, the NJDEP has adopted Flood Hazard Area Control Act Rules (N.J.A.C. 7:13) to incorporate more stringent standards for development in flood hazard areas and riparian zones. A riparian zone is land and vegetation with and adjacent to surface waters.

New Jersey regulates flood-prone areas through the New Jersey Flood Hazard Area Control Act, N.J.S.S. 58:16A-50 et. Seq., and its rule, adopted November 5, 2017. The act recognizes the importance not only avoiding building in unsafe places, but also preserving the vegetation that “is essential for maintaining bank stability and water quality.” The rules set standards for development in flood hazard areas and areas adjacent to surface waters “in order to mitigate the adverse impacts to flooding and the environment that can be caused by such development.” As defined by the rules, a flood hazard area exists along every regulated waterway with a drainage area of 50 acres or more.

A Flood Hazard Area is defined as the area equal to the 100-year flood plus a “factor of safety.” It includes both a floodway and a flood fringe. There are six measures for determining the flood hazard area under the FHCA rules. They include a NJDEP delineation method; flood studies are undertaken; FEMA tidal, fluvial, and hydraulic methods; and approximation and calculation methods.

NJDEP regulated activities in a flood hazard area or riparian area include:

- The alteration of topography through excavation, grading, and or placement of fill;
 - The clearing, cutting, and or removal of vegetation in a riparian zone;
 - The creation of impervious surface;
 - The storage of unsecured material;
 - The construction, reconstruction, and or enlargement of a structure; and
 - The conversion of building into a private residence on a public building.
- (N.J.A.C. 7:13-2.4)⁴³

The appropriate permit must be obtained to engage in any of these activities in a regulated area. There are several different categories of permits: permits by rule, general permits, and individual permits. There are area-specific standards, depending on whether the area includes a channel, riparian zone, floodway, flood fringe, fishery resource, threatened and endangered species, or acid-producing soils. And there are specific standards for different facets, such as stormwater management, excavating, filling, building, roads, and parking areas. Construction is not necessarily prohibited in a regulated area, but a disturbance must be justified.

Regulated waterways in Edison include Bound Brook and the Raritan River. Both waters are classified by NJDEP as FW2-NT and are subject to a regulated 50-foot riparian zone, measured

from the top of the bank, along both sides by the NJDEP. In Edison, riparian zone regulations are enforced by the Department of Planning and Engineering.⁴⁴

FEMA Flood Zones

Federal, state, and municipal governments provide oversight regarding areas prone to flooding through various acts, laws, and ordinances. The intent is to minimize property damage and negative ecological effects by limiting development and protecting positive environmental influences in areas subject to frequent flooding.

At the federal level, the United States Geological Survey (USGS) maps flood-prone areas, and the Federal Emergency Management Agency (FEMA) evaluates and maps Special Flood Hazard Areas (SFHAs) that can be used in participating communities to determine flood insurance rates. On the state level, the NJDEP delineates Flood Hazard Areas along streams and regulated activities within these areas. In recent years, FEMA and the state have coordinated to integrate NJDEP flood hazard area parameters into FEMA updates. Municipal code may set standards that are stricter than either the state or FEMA.

FEMA Mapping and Flood Insurance Program

Special Flood Hazard is evaluated and mapped by FEMA. Other flood zones are used to create official Flood Insurance Rate Mapping (FIRM) that can be used in participating communities, such as Edison, to determine flood insurance rates. Communities can choose to participate in the National Flood Insurance Program (NFIP), which requires mandatory flood insurance in areas mapped as Special Flood Hazard Areas. A Special Flood Hazard Area is defined as “an area that would be inundated by the flood having one percent of chance being equaled or exceeded in any given year,” also known as the base flood or 100-year flood zone. NFIP mapping also includes information on 500-year flood zones and various sublevels within the 100-year zone. *Map 15* and *Table 22* illustrates both the 100-year and 500-year threshold for the Township of Edison. Flood insurance is mandated in 100-year, or 1%, flood zones.⁴⁵

Zone	Acres	Percentage of Township
100-year flood zone	2,939	14.98%
500-year flood zone	390	2.0%
Remainder of Township	16,285	83.02%

Source: FEMA Flood Data for Middlesex County

Flooding in Edison

Within the Township of Edison, the 100-year flood zone occurs along Bound Brook, Robinsons Branch, Ambrose Brook South Branch Rahway River, and the Mill Brook, which drains directly into the Raritan River. The 500-year, or 0.2%, flood zone occurs near some areas of the 100-year flood zone.

On the regional level, the Township of Edison participated in the 2015 Middlesex County Hazard Mitigation Plan. According to the plan, the Township of Edison has 4.74 square miles of land within the 100-year floodplain, which includes 15.5% of the jurisdiction area. There are 551

parcels with centroids within the 100-year floodplain, which make up 1.5% of the Township's parcels. Previously, the greatest flood risk in these areas has been during hurricanes and tropical storms. Current FEMA guidance uses the term extent as analogous to potential severity. The extent of the flood hazard in Edison is on the order of one to three feet (for the properties that are at the lowest elevations) in events that cause overbank flooding on the Raritan or during extreme rain events.⁴⁶

Chapter 33 of the Township of Edison's Municipal Code outlines regulations regarding Flood Damage Prevention and Protection. This code includes ordinances regarding methods of reducing flood losses, general provisions for establishing areas of Special Flood Hazard, and specific standards for construction.⁴⁷



Air

Air Quality

The NJDEP carefully monitors air quality in the Edison Township and New Jersey through various regional collection stations that ensure air quality standards are meeting the national standards set by the Clean Air Act. The pollutants measured in the air can vary greatly over a year and even from day to day, depending on weather conditions and traffic patterns. The local air testing stations in New Jersey measure maximum pollutant concentration, assess population exposure, determine the impact of major pollution sources, measure background levels, determine the extent of regional pollutant transport, or measure secondary impacts in rural areas. The information gathered is transmitted in real-time and consolidated in yearly reports to ensure that both State and National Clean Air Standards are met.⁴⁸

Local Resources Governing Air Quality

Municipal Code: Environmental Regulation 22-1.7

Code 22-1.7 prohibits emission of substances into the open air in quantities that result in air pollution.⁴⁹

Middlesex County Department of Public Safety and Health:

Middlesex County Department of Public Safety and Health's Air Pollution Control Program investigates citizen complaints, including open burning, odors, smoke, idling vehicles, and particulate emissions. Additionally, Air Pollution Control Program personnel inspect dry cleaning facilities and auto body shops to ensure minimal Perchloroethylene and Volatile Organic Compounds (VOCs) pollution.⁵⁰

New Jersey Anti-Idling Law (Gasoline and Diesel)

New Jersey Administrative Code (Title 7, Chapter 27, Subchapter 14 for diesel and Subchapter 15 for gasoline) limits vehicle idling to three minutes on both public and private property.⁵¹

Sustainable Jersey: Smart Workplaces Program

Edison has been awarded Platinum Status for its participation in the Smart Workplaces Awards Program through Keep Middlesex Moving. Edison maintains one of the largest municipal fleets of hybrid vehicles in New Jersey. Hybrid vehicles help reduce emissions of VOCs, nitrous

oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), and several pollutants classified by the EPA as Air Toxics.⁵²

National Clean Air Standards

In 1970, the federal government passed the Clean Air Act, setting standards to be met throughout the country. The Act was amended in 1990, with focus on four areas of pollution: acid rain, urban air pollution, toxic air emissions, and stratospheric ozone depletion. The amendment also introduced a permits program and strengthened enforcement.⁵³ Under the Act, it is the responsibility of the United States EPA to set National Ambient Air Quality Standards (NAAQS) for six common pollutants (ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, fine particulates, and lead) and the responsibility of each state to develop State Implementation Plans (SIPs) to attain and maintain these standards. In New Jersey, that role is assigned to the NJDEP Division of Air Quality (DAQ) and its Bureau of Air Monitoring (BAM), which monitors the State's ambient air monitoring network.

In addition to the six criteria pollutants, the US EPA regulates 187 toxic air pollutants known as Hazardous Air Pollutants (HAPs) or Air Toxics. These pollutants are known or suspected carcinogens that have human and environmental health impacts. Some examples are benzene, perchloroethylene, and methylene chloride. National Air Toxics Assessments by the EPA assess the 33 most hazardous Air Toxics.

The NJDEP monitors ambient air, determines sources of pollution, strategizes ways to reduce emissions, and performs risk assessments and vehicle inspections, as well as runs voluntary programs to promote cleaner vehicles. The Air Compliance and Enforcement program serves to enforce the federal standards for air emissions set by the EPA.⁵⁴

The NJDEP annually assesses air quality based on the Air Quality Index (AQI). The Air Quality Index, as defined by the NJDEP, is a national air quality rating system based on the NAAQS. **Figure 6** illustrates the AQI levels used to describe NAAQS. In 2018, New Jersey experienced 198 days with “moderate” air quality, 145 days with “good” air quality, 19 days with air quality unhealthy for sensitive groups (children, elders, and those with asthma) and three days with air quality unhealthy for the general population.⁵⁵

Regional/Local Statistics

The NJDEP measures compliance with EPA criteria pollutant standards through a network of regional air quality monitoring sites. There are monitoring sites throughout the state, and each monitor a limited set of criteria pollutants; no station monitors for all six. New Jersey residents can access information, including hourly data as well as annual air quality reports through the NJDEP's Air Quality Index website. The closest monitoring stations to Edison Township are Rutgers-New Brunswick (3 miles), Elizabeth Lab (19 miles), and Newark Firehouse (24.3 miles). Middlesex County belongs to the New York-Northern New Jersey-Long Island NY-NJ-CT area to determine attainment or nonattainment.⁵⁶

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 6. Air Quality Index

Criteria Pollutants

Each of the six criteria pollutants are discussed below. Information on national and state standards and localized air monitoring results are provided based on 2018 NJDEP reports, the latest available data at time of publication. In the discussions of the individual criteria pollutants, primary standards are those associated with health effects, and secondary standards are based on “welfare” effects (e.g., damage to trees, crops, and materials).

Ozone

Ozone (O₃) is defined by the NJDEP *2018 Ozone Summary* as a gas consisting of three oxygen atoms, which occurs naturally in the upper atmosphere (stratospheric ozone). It protects us from harmful UV rays. Ozone, which is found in the lower atmosphere, or tropospheric ozone, is considered a pollutant and is known to have harmful health effects. Ozone is formed in the lower atmosphere through chemical reactions between emissions of nitrogen oxides (NO_x) and Volatile Organic Compounds (VOCs), as well as the presence of heat and sunlight. Since the 1990 amendments to the Clean Air Act, national sulfur dioxide emissions have decreased by 88%, and national volatile organic compound emissions have decreased by 42%. Sources of emissions that contribute to the creation of ground-level ozone include industrial facilities, electric utilities, gasoline vapors, and chemical solvents. The EPA requires New Jersey to monitor ozone from March 1st to October 31st because this is the state’s “ozone season,” during which there is sufficient heat and sunlight for ground-level ozone to form.⁵⁷

The EPA most recently revised the NAAQS for O₃ in 2015, lowering the 8-hour average from 0.075 ppm to 0.070 ppm, for both primary and secondary standards, effective as of September 2016.⁵⁸ In 2018, the EPA states that there were a collective 671 days at or above the “Unhealthy for Sensitive Groups” level for ozone in 35 U.S. metropolitan areas. In the New York

metropolitan area, the EPA reports 18 days at or above the “Unhealthy for Sensitive Groups” level for ozone in 2017, with an increase to 25 days in 2018. These are both below the 10-year average for the New York Metropolitan region, which is 28 days per year.⁵⁹

New Jersey standards are based on 1-hour averaging with the primary standard set at 0.12 ppm. Of the sixteen sites in New Jersey where ozone is monitored, eleven have kept records since 2000. The data from these sites show a significant downward trend in ozone emissions from 2000 to 2014, based on the number of days per year in which the sites reported an ozone level above the State health standard.⁶⁰ (*Figure 7*)

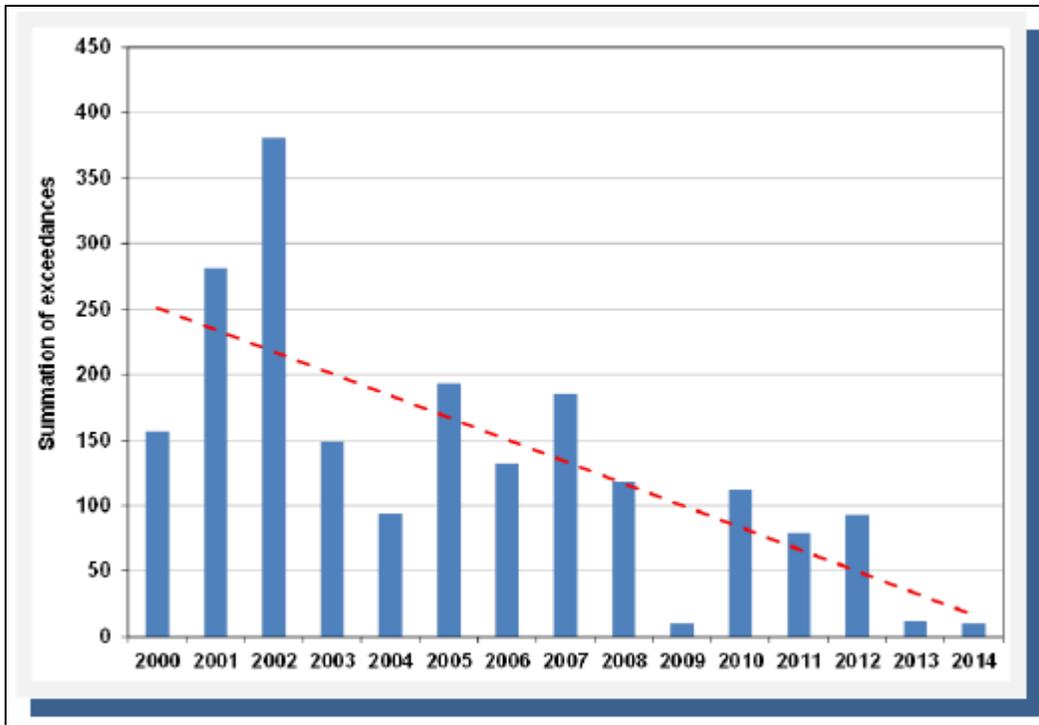


Figure 7. Ozone Trends in New Jersey, 2000-2014

The NJDEP’s efforts to reduce ozone pollution are currently focused on minimizing precursor pollutants, VOCs, and Nitrogen Oxides (NO_x). Common sources of these precursors are burning gasoline in automobiles and small engine equipment, such as lawnmowers. Levels of NO_x in New Jersey are largely affected by emissions from regional upwind sources outside New Jersey.⁶¹

The NY-NJ-CT area, which includes Middlesex County, New Jersey, is a “moderate” nonattainment area for NAAQS as of December 2019 according to the revised 2015 8-hour ozone standards of 0.070 ppm. The ozone monitoring stations closest to Edison reported levels above the 8-hour daily maximum of 0.070 ppm and at or below the NJDEP 1-hour daily maximum standard of 0.12 ppm.⁶² (*Table 23*)

Monitoring Site	1-Hour Daily Maximum	Highest Daily Maximum	4^h- Highest Daily Max.*	2016-18 Average of 4th
Rutgers University	0.098	0.080	0.076	0.075
Newark Firehouse	0.120	0.096	0.071	0.067

**The 4^h-Highest Daily Maximum average is the design value in determining attainment or nonattainment for federal ozone standards.
Source: NJDEP 2018 Ozone Summary*

Sulfur Dioxide

The NJDEP 2018 Sulfur Dioxide Summary defines sulfur dioxide (SO₂) as a heavy, colorless gas with a suffocating odor, which easily dissolves in water to form sulfuric acid. Sources of SO₂ gas include burning fuels containing sulfur, such as coal, oil, and gasoline. In 2017, point sources accounted for 72% of sulfur dioxide emissions in New Jersey. New Jersey’s primary concern when monitoring sulfur dioxide is the risk of acid rain. The chemical reaction between atmospheric sulfur dioxide and rain creates acid rain, which can cause damage to forests, crops, and aquatic environments. Coal-burning in Pennsylvania is a significant source of higher sulfur dioxide levels in New Jersey due to wind patterns.

In 2010, the EPA established a primary 1-hour National standard for SO₂ at 75 parts per billion (ppb) and revoked the 24-hour and annual average national standard, while the 3-hour secondary standard remained. To comply with the 1-hour standard, the state calculates the 99th percentile of 1-hour daily maximum concentrations for each monitoring site in an area every year. Then, they average each site’s values for the three most recent years. The resulting number is the design value. New Jersey’s standards for SO₂ are slightly different than national standards and are outlined in **Table 24** below.⁶³

Averaging Period	Type	National	New Jersey
1-hour ^b	Primary	75 ppb	---
3-hours	Secondary	0.5 ppm ^c	1300 µg/m ³ (0.5 ppm)
24-hours ^d	Primary	---	365 µg/m ³ (0.14 ppm)
24-hours ^d	Secondary	---	260 µg/m ³ (0.10 ppm)
12-months	Primary	---	80 µg/m ³ (0.03 ppm)
12-months	Secondary	---	60 µg/m ³ (0.02 ppm)

^a Based on running averages, over any 12 consecutive months in a year.
^b To meet this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour averages at each monitor within the state must not exceed 75 ppb.
^c Based on successive non-overlapping blocks, beginning at midnight each day.
^d Not to be exceeded more than once in a year.
Source: NJDEP 2018 Sulfur Dioxide Summary

Currently, New Jersey’s anti-idling law contributes to reducing sulfur dioxide emissions. The state has also effectively regulated sulfur dioxide content in fuels since 2010. The nearest monitoring sites to Edison which monitor sulfur dioxide are Elizabeth Lab, Elizabeth, and Newark Firehouse. In 2018 the state did not exceed the 1-hour NAAQS of 75 ppb of SO₂. (*Table 25* and *Table 26*)

Monitoring Site	1-Hour Average (ppb)			2016-2018 Design Value*
	Highest Daily Maximum	2 nd -Highest Daily Maximum	99 th Percentile Daily Maximum	
Elizabeth Lab	12.8	9.3	6.8	6
Elizabeth	6.2	5.5	4.6	4
Newark Firehouse	8.4	4.9	3.5	3

Source: NJDEP 2018 Sulfur Dioxide Summary

Monitoring Site	3-Hour Average Concentrations (ppm)			
	Block		Running	
	Maximum	2 nd -Highest	Maximum	2 nd -Highest
Elizabeth Lab	0.0057	0.0051	0.0058	0.0046
Elizabeth	0.0057	0.0051	0.0058	0.0046
Newark Firehouse	0.0056	0.0030	0.0056	0.0033

Source: NJDEP 2018 Sulfur Dioxide Summary

Carbon Monoxide

According to the NJDEP 2018 Carbon Monoxide Summary, carbon monoxide is a colorless, odorless gas formed when carbon in fuels is not completely burned. Sources of carbon monoxide include exhaust from internal combustion engines, especially on-road vehicles, as well as non-road vehicles, generators, construction equipment, boats, and other types of mobile sources. Nationwide, mobile sources account for half of carbon monoxide emissions and account for 90% in New Jersey. Forest fires and industrial processes are other potential sources of CO.

Carbon monoxide is particularly a concern during atmospheric inversions. When warm air rises, it can trap a layer of cooler air underneath, keeping pollutants in higher concentration closer to the ground. CO levels are often higher during winter months, as inversions are more common. Additionally, CO levels are higher during rush hour traffic due to vehicle exhaust.

The EPA has only a primary standard of a 1-hour standard of 35 ppm and an 8-hour standard of 9 ppm. New Jersey has a primary and secondary 1-hour standard of 40 mg/m³, or 35 parts per million, as well as a primary and secondary 8-hour standard of 10 mg/m³, or 9 parts per million.⁶⁴ (*Table 27*)

Table 27. National and New Jersey Ambient Air Quality Standards for Carbon Monoxide			
Averaging Period	Type	National ^a	New Jersey ^b
1-Hour	Primary	35 ppm	40 mg/m ³ (35 ppm)
1-Hour	Secondary	---	40 mg/m ³ (35 ppm)
8-Hours	Primary	9 ppm	10 mg/m ³ (9 ppm)
8-Hours	Secondary	---	10 mg/m ³ (9 ppm)

^a Not to be exceeded more than once in a calendar year.
^b Not to be exceeded more than once in any consecutive 12-month period.
Source: NJDEP 2018 Carbon Monoxide Summary

The closest Carbon Monoxide monitoring sites to Edison Township are Elizabeth Lab, Elizabeth, and Newark Firehouse. In 2018 there were no exceedances of CO standards at any New Jersey monitoring site. The highest 1-hour and 8-hour averages were recorded at the Jersey City monitoring station, 5.1 ppm and 3.2 ppm, respectively. (*Table 28*)

Table 28. 2018 Carbon Monoxide Concentrations in New Jersey: 1-Hour and 8-Hour Averages (ppm)				
Monitoring Site	1-Hour Average Concentrations		8-Hour Average Concentrations	
	Highest	2nd-Highest	Highest	2nd-Highest*
Elizabeth Lab	2.3	2.1	1.3	1.2
Elizabeth	2.9	2.8	2.8	2.7
Newark Firehouse	2.626	2.569	1.8	1.7

*Non-overlapping 8-hour periods
Source: NJDEP 2018 Carbon Monoxide Summary

Since the 1990 amendment to the Clean Air Act, carbon monoxide levels have decreased significantly. As of 2002, New Jersey has been an attainment area for carbon monoxide NAAQS. Stricter fuel standards throughout the nation are the primary cause of lowered CO levels.⁶⁵

Nitrogen Dioxide

According to the NJDEP 2018 Nitrogen Dioxide Summary, nitrogen dioxide (NO₂) is a reddish-brown highly reactive gas formed in the air through the oxidation of nitric oxide (NO). Gas stoves and heaters are a large source of NO emissions. The pie chart below is a summary of NO_x in New Jersey.⁶⁶ (*Figure 8* and *Figure 9*)

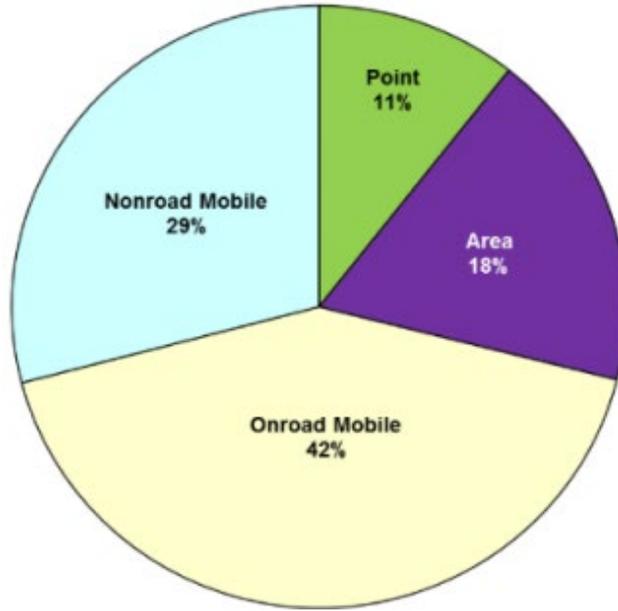


Figure 8. Sources of NOx in New Jersey in 2017.

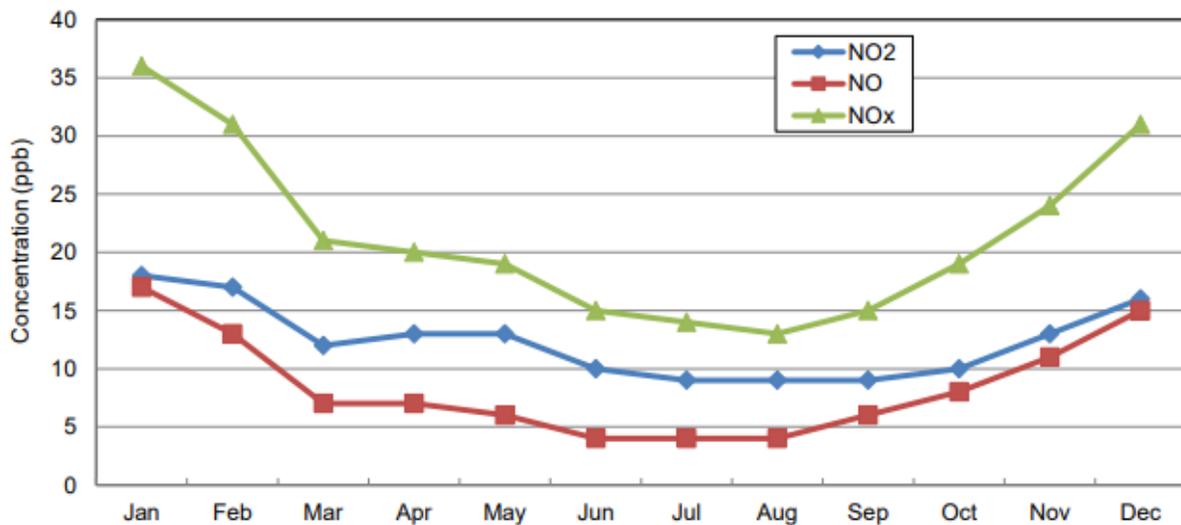


Figure 9. 2018 Nitrogen Oxides Concentrations (NJ): Average Monthly Variation (ppb)

NO_x levels are typically higher in the winter due to heating during cold months, as well as lighter winds leading to poorer local dispersion conditions. Carbon monoxide emissions peak during morning and afternoon rush hours due to the volume of vehicles on the roads.

The 1-hour primary NAAQS for NO₂ is 100 parts per billion (ppb), and the annual primary and secondary NAAQS is 53 ppb. New Jersey has the same standards for NO₂, although the NJAAQS uses a unit of micrograms per cubic meter (µg/m³) and uses 12-month averages. **Table 29** shows a summary of national and New Jersey AAQS for nitrogen dioxide.

Averaging Period	Type	National	New Jersey
1-Hour	Primary	100 ppb (0.100 ppm)	---
Annual	Primary & Secondary	53 ppb (0.053 ppm)	---
12-Month	Primary & Secondary	---	100 µg/m ³ (0.053 ppm)

Source: NJDEP 2018 Nitrogen Dioxide Summary

The 1-hour NO₂ standard is met when the 2-year average of the 98th-percentile of the daily maximum 1-hour NO₂ concentrations are less than the NAAQS of 100 ppb. Daily 1-hour maximums are recorded at each nitrogen dioxide monitoring site. The 98th-percentile value is calculated each year and averaged with the past two years for the 98th-percentile. The average of these three values is the design value used to determine attainment or nonattainment of NO₂.

The closest NO₂ monitoring sites to Edison Township are Rutgers University, Elizabeth Lab, and Newark Firehouse. In 2018 in New Jersey, there was one exceedance of the daily maximum 1-hour concentration, with a recorded maximum of 131 ppb at the Fort Lee Near Road monitoring station. The 98th-percentile of the 1-hour daily maximum concentrations for each monitoring site, as well as the 3-year average, are in **Table 30**.

Monitoring Site	1-Hour Average		
	Daily Maximum	98th-Percentile	2016-2018 98th-%ile 3-Year Average
Rutgers University	50	42	41
Elizabeth Lab	84	61	60
Newark Firehouse	77	52	55

Source: NJDEP 2018 Nitrogen Dioxide Summary

The second-highest average for any 12-month period was recorded as 20 ppb at the Elizabeth Lab station. This is well below the NJAAQS 12-month period standard of 100 ppb. The Elizabeth Lab station recorded an annual average of 19 ppb for the 2018 calendar year.

New Jersey began regularly monitoring NO₂ in 1996, and the last year in which the annual average NO₂ was exceeded was in 1974. Although NO₂ levels measured in New Jersey have been well below the standard for decades, a greater concern is nitrogen oxides emissions in the atmosphere, which react with other pollutants to form ground-level ozone.

Particulate Matter

Particulate matter⁶⁷ can be any manmade or natural particles found in the air, such as dust, dirt, smoke, sea salt, and liquid droplets. At any size, these particles can affect the environment. The

total of all particles, of whatever size, is referred to as “Total Suspended Particulates” (TSPs). Particles less than 10 micrometers in diameter (PM₁₀) are called “Inhalable Particulates” because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers (PM_{2.5}), called “Fine Particulates,” are believed to pose the greatest health risk. NAAQS for both Inhalable Particulates (PM₁₀) and Fine Particulates (PM_{2.5}) are set at the same level for both primary (health) and secondary (environmental welfare) standards. At greatest risk are children, the elderly, and individuals with heart and lung diseases, such as asthma.

The EPA abandoned standards for TSPs in favor of the smaller PM₁₀ and PM_{2.5} particulates, however, New Jersey still maintains TSP standards, as shown in (*Table 31*). For PM_{2.5} standards, an annual concentration for a given site is calculated by averaging the annual mean concentrations for the three most recent consecutive calendar years, in this case, 2016-2018. Similarly, the 24-hour concentration for a given site is calculated by averaging the 98th percentile 24-hour concentrations for each year for the same 3-year period. For PM₁₀ standards, the concentrations are calculated as the annual mean and the highest 24-hour average PM₁₀ concentrations.

Table 31. Particulate Matter – 2018 National and New Jersey NAAQS <i>micrograms per cubic meter (µg/m³)</i>			
Pollutant	Averaging Time	Type	Level
Fine Particulate (PM _{2.5})	Annual	Primary	12.0 µg/m ³
	Annual	Secondary	15.0 µg/m ³
	24-Hour Average	Primary & Secondary	35 µg/m ³
Inhalable Particulate (PM ₁₀)	24-Hour Average	Primary & Secondary	150 µg/m ³
<i>Source: NJDEP 2018 Particulate Summary</i>			

In New Jersey, 21 sites monitor PM_{2.5}, and three stations monitor PM₁₀. The EPA has changed NAAQS requirements over time to put a greater emphasis on fine particulate matter due to the greater human health risks. Rutgers University and Elizabeth Lab use filter-based samples for PM_{2.5}. This is the Federal Reference Method (FRM) for determining compliance with particulate matter NAAQS. In addition, these monitoring sites use a Beta Attenuation Monitor (BAM), which measures loss of attenuation of beta particles due to absorption by PM_{2.5} particles collected on a filter tap. The BAM allows the station to provide continuous, real-time hourly data to the public. Newark Firehouse is the closest monitor to Edison, which samples PM₁₀. Samples are taken once every three days.

The PM_{2.5} monitors at Rutgers University, Elizabeth Lab, and Newark Firehouse also use 24-hour filters, part of the EPA’s Chemical Speciation Network (CSN). According to the EPA, these stations results are not used for attainment or nonattainment decisions but provide data for:

- The assessment of trends;
- The development of effective State Implementation Plans (SIPs) and determination of regulatory compliance;
- The development of emission control strategies and tracking progress of control programs;
- Aiding in the interpretation of health studies by linking effects to PM_{2.5} constituents;

- Characterizing annual and seasonal spatial variation of aerosols; and
- Comparison to chemical speciation data collected from the Interagency Monitoring of Protected Visual Environments (IMPROVE) network.⁶⁸

The NAAQS for PM_{2.5} is an annual mean of 12 µg/m³ and a 24-hour average of 35 µg/m³. The highest 24-hour concentration was recorded at Elizabeth Lab at a maximum PM_{2.5} concentration of 33.2 µg/m³. The stations closest to Edison were compliant for particulates. (*Table 32*)

Table 32. 2018 PM_{2.5} Concentrations in New Jersey: Annual and 24-Hour Averages (FRM) (µg/m³)				
Monitoring Site	Number of Samples	Annual Average	24-Hour Average	
			Highest	98th-ile
Rutgers University	116	6.79	18.1	16.5
Elizabeth Lab	347	8.82	33.2	21.8
Newark Firehouse	119	7.75	26.1	18.3

Source: NJDEP 2018 Particulate Matter Summary

Rutgers University, Elizabeth Lab, and Newark Firehouse also use continuous BAM to measure PM_{2.5} concentrations. Their annual averages and 24-hour average highest- and 98th-percentile-values are displayed in *Table 33*.

Table 33. 2018 PM_{2.5}: Annual and 24-Hour Averages (Continuous Monitors) (µg/m³)			
Monitoring Site	Annual Average	24-Hour Average	
		Highest	98th-ile
Rutgers University	8.02	22.5	18.6
Elizabeth Lab	10.56	27.8	23.1
Newark Firehouse	8.61	31.7	21.7

Source: NJDEP 2018 Particulate Matter Summary

Design values for PM_{2.5} are calculated by the EPA, based on a 3-year average of both annual averages and the 98th percentile of 24-hour averages. For sites that use an FRM monitor, those data take precedence. (*Table 34*)

Table 34. PM_{2.5} Design Values for 2016-2018: 3-Year Average of the Annual Average Concentrations & 98th Percentile 24-Hour Average Concentrations (µg/m³)		
Monitoring Site	3-Year (2016-2018) Average	
	Annual	98th %-ile 24-Hour
Rutgers University	8.2	19
Elizabeth Lab	9.2	21
Newark Firehouse	8.4	19

Table 34. PM_{2.5} Design Values for 2016-2018: 3-Year Average of the Annual Average Concentrations & 98th Percentile 24-Hour Average Concentrations (µg/m³)		
Monitoring Site	3-Year (2016-2018) Average	
	Annual	98th %-ile 24-Hour
<i>Source: NJDEP Particulate Matter Summary</i>		

Newark Firehouse is the closest monitoring station to Edison Township, which monitors PM₁₀. The state is currently in attainment of the 24-hour NAAQS of 150 µg/m³. (*Table 35*)

Table 35. 2018 PM₁₀ Concentrations Measured at Newark Firehouse Station: 24-Hour and Annual Averages (µg/m³)			
Number of Samples	Annual Average	24-Hour Average	
		Highest	Second Highest
114	13.1	40	38
<i>Source: NJDEP 2018 Particulate Matter Summary</i>			

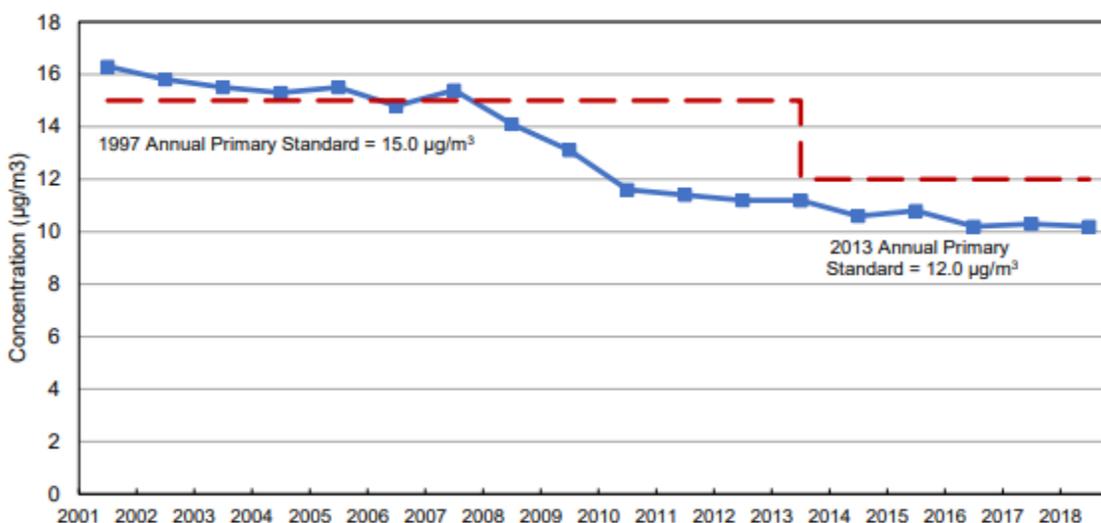


Figure 10. PM_{2.5} Design Value Trend in New Jersey, 2001-2018: 3-Year Average of the Annual Average Concentrations (µg/m³)

Data collected since 2001 in New Jersey show a steady decline in the 3-year averages of PM_{2.5} concentration. (*Figure 10*)

Lead

Lead is a hazard human to environmental health, whether the source is lead in the air, in paint on walls, in our water, or in our soils. When taken into the body, lead circulates via the blood and accumulates in the bones. It affects the blood’s oxygen-carrying capacity and can negatively affect the nervous system, kidneys, immune system, reproductive, developmental, and cardiovascular systems. It most commonly causes neurological effects in children and cardiovascular effects in adults. On a secondary level, lead from the air or water bodies may accumulate in soils and sediments, adversely affecting biodiversity.

Taking lead out of on-road motor vehicle gasoline has been the primary reason for a decline in lead in the air. According to the EPA, there has been an 82% decrease in the national average of lead concentration in the air from 2010 to 2018. Sources of lead in the air include industrial pollution and lead-based paints.⁶⁹ Contributors to lead in the air today include ore and metals processing and leaded aviation fuel. In 2008 the NAAQS level was set at 0.15µg/m³ for a rolling 3-month average. As of 2013, in accordance with the new 2008 standard, there are 21 areas nationwide that are in non-attainment, with the closest locations being in central Pennsylvania.⁷⁰

The NJDEP has data for New Jersey stations monitoring lead in the air from 1990 to 1995-1996. Although some stations exceeded NAAQS levels in the early 1990's, all were below the standards by 1996.

In September of 2016, the EPA decided to retain these standards to protect primary and secondary benefits based on scientific evidence showing lead's health effects, confirming the need for a margin of safety.⁷¹ In 2018, lead was monitored at the Newark Firehouse based on a 3-month rolling average which, ranged between 0.001 and 0.003 µg/m³. The United States has itself decreased its lead concentrations for outdoor air by over 90% since 1980.

Air Toxics

Almost 200 air toxics have been identified on the list of Hazardous Air Pollutants (HAPs) maintained by the EPA. The EPA issues a National-Scale Air Toxics Assessment (NATA), which the NJDEP adapts to evaluate the types and amounts of air toxics people are exposed to in New Jersey. NJDEP compares the estimated NATA air concentrations to their chemical-specific health benchmarks and divides the modeled air concentration by the health benchmark to get a risk ratio. If the risk ratio for a specific chemical is greater than one, it may be of concern, increasing the risk for cancer or other negative health effects. In general, higher population densities result in greater emissions of, and exposure to, air toxics.⁷²

Currently, the Air Toxics Program in New Jersey includes risk assessments, federal regulations, as well as other NJDEP programs which have a role in reducing emissions throughout the state. This program includes permit review, voluntary reductions, other air pollution programs, and other air toxics initiatives.⁷³ According to the NATA published in 2014, Middlesex County has a risk ratio equal to or greater than one (1) for the following air toxics⁷⁴:

Acetaldehyde

Acetaldehyde is a volatile organic compound that is the product of incomplete wood combustion, coffee roasting, burning tobacco, vehicle exhaust fumes, coal refining, and waste-processing. The two highest sources are residential fireplaces and woodstoves.⁷⁵

Acrolein^b

Acrolein is formed by the breakdown of outdoor pollutants, as well as the burning of fossil fuels such as gasoline and oil.⁷⁶

^b Based on noncarcinogenic effects

Benzene

Benzene is found in emissions from burning coal and oil, motor vehicle exhaust, and evaporation from gasoline service stations. Tobacco smoke accounts for an estimated 50% of national exposure to benzene, according to the EPA.⁷⁷

1,3-Butadiene

Often referred to as butadiene, 1,3-butadiene is a colorless gas with a mild odor similar to gasoline. Butadiene can get into the air from vehicle exhaust, manufacturing facilities, forest fires, or other combustion. Higher levels of butadiene are found in highly industrialized cities or near oil refineries or plastic and rubber factories, according to the EPA.⁷⁸

Carbon tetrachloride

Carbon tetrachloride may be released into the air from manufacturing or evaporation after leaching into the groundwater below a landfill. It is a common pollutant in both ambient indoor and outdoor air.⁷⁹

Diesel Particulate Matter

Diesel exhaust is one of the largest sources of fine particulate matter. Fine particulate matter can contribute to haze, decreasing visibility and additionally may result in ozone formation in the atmosphere.⁸⁰

Formaldehyde

Formaldehyde is a colorless, flammable gas at room temperature and has a strong odor. It is a byproduct of combustion and can be found in emissions from fuel-burning appliances and cigarette smoke.⁸¹

Hydrazine

Hydrazine is used in agricultural pesticides, pharmaceutical intermediates, photography chemicals, boiler water corrosion treatment, textile dyes, and fuel for rockets and spacecraft. Small amounts have also been detected in tobacco smoke.⁸²

Naphthalene

Naphthalene is used in the production of phthalic anhydride, carbamate insecticides, surface active agents, and resins, as a dye intermediate, as a synthetic tanning agent, as a moth repellent, and in miscellaneous organic chemicals.⁸³

Table 36 provides a detailed comparison of pollutant to health benchmarks.

Table 36. Middlesex County Average 2014 NATA Modeled Air Concentrations Compared to Health Benchmarks

Pollutant	Modeled Air Concentration (ug/m ³)	Health Benchmark (ug/m ³)	Risk Ratio	% Contribution by Source Category				
				Point Sources	Nonpoint Sources	On-road Mobile	Non-road Mobile	Background & Secondary
1,3-Butadiene	0.04	0.033	1	0%	19%	54%	24%	3%
Acetaldehyde	0.97	0.45	2	0%	3%	7%	3%	87%*
Benzene	0.55	0.13	4	1%	26%	47%	24%	2%
Carbon tetrachloride	0.55	0.17	3.2	0%	0%	0%	0%	100%
Chromium (hexavalent form)	0.000031	0.000083	0.3	68%	28%	1%	3%	0%
Diesel Particulate Matter	0.57	0.0033	172	0%	0%	58%	42%	0%
Ethylene oxide	0.00026	0.00043	0.6	81%	19%	0%	0%	0%
Formaldehyde	1.2	0.077	15.5	1%	5%	8%	4%	82%*
Hydrazine	0.00005	0.0002	0.25	100%	0%	0%	0%	0%
Naphthalene	0.04	0.029	1.37	10%	28%	45%	9%	8%
Nickel Compounds	0.00052	0.0021	0.24	32%	17%	9%	42%	0%
Nitrobenzene	0.0000004	0.025	0.000016	62%	38%	0%	0%	0%
Tetachloroethylene	0.026	0.17	0.15	16%	84%	0%	0%	0%
Vinyl chloride	0.0008	0.11	0.007	100%	0%	0%	0%	0%

Chemicals with risk ratios greater than or equal to 1 are in **bold**.

Risk Ratios based on noncarcinogenic effects are in *italics*.

The symbol ug/m³ is micrograms per cubic meter, the amount (in micrograms) of a chemical in a cubic meter of air. This is also known as a concentration.

For diesel particulate matter, on-road and non-road concentrations include a model-estimated background concentration. *Acetaldehyde, acrolein and formaldehyde concentration estimates include secondary formation, which is the process by which chemicals in the air are transformed into other chemicals.

**PAH/POM is "polycyclic aromatic hydrocarbons/polycyclic organic matter." These define a broad class of compounds. The chemicals making up this class were broken up into 8 groups based on toxicity, and each group was assigned a cancer-weighted toxicity estimate. 0.0072 ug/m³ is the health benchmark average across the 8 groups.

Source: 2014 Risk Results for NJ: Middlesex County

Sources of Air Toxics Emissions

The source of air toxics varies for each pollutant. On-road mobile sources of air toxics emissions are vehicles; non-road mobile sources include aircraft, trains, lawnmowers and leaf blowers, boats, dirt bikes, and construction vehicles. Nonpoint sources of air toxics emissions include heating, fuel and pesticide use, dry cleaners, and consumer products, such as adhesives, sealants, paint, personal care, and other household products.⁸⁴ The NJDEP identifies point sources as “large facilities that emit a significant amount of air pollution during manufacturing, power generation, heating, incineration, or other such activity” as well as “smaller facilities including those that are required to report their emissions under the federal Toxic Release Inventory program and the state’s Community Right-To-Know program” (see *Contaminated Sites* chapter).

An additional category of contributions to emissions is background and secondary sources. Background concentrations generally cannot be sourced to current, local emissions. Secondary concentrations refer to chemicals that have been transformed in the air from an air pollutant into another chemical, which may have a different toxicity level.⁸⁵

Radon

Radon gas is radioactive, coming from the breakdown of natural uranium. Radon is odorless and tasteless, so special tests are the only current way to detect it. People can be exposed to radon if there is a crack in the foundation of a building or small opening in pipes, through which radon can seep.⁸⁶ Radon releases radioactive energy, causing lung damage and lung cancer. In the United States, radon is the second lead cause of lung cancer, killing around 20,000 people a year.⁸⁷

The NJDEP categorizes Edison Township as having moderate radon potential due to the soil’s uranium content. It is recommended for all homeowners to test for radon in New Jersey.

Noise and Odors

Noise

The NJDEP helps regulate noise in New Jersey through the Noise Control Act of 1971, which helps them track noise complaints. This Act covers noises made from airplanes, highways, industrial and commercial areas, and residential noise. Noises classified as nuisances can be considered a public health nuisance, enforced by the local health agency or the Code of Criminal Justice. Noises are considered a public health nuisance when they are “unreasonably or unnecessarily loud”.⁸⁸

Noise regulations and enforcement procedures are outlined in Section 12-27 of Edison’s municipal code.⁸⁹ Middlesex County’s Public Safety and Health office has a Noise Pollution Program that enforces state noise pollution regulation. The Noise Pollution Program also assists towns with drafting and enforcing municipal noise codes.⁹⁰

Odors

The NJDEP classifies odor under air pollution when it interferes with people’s general enjoyment. The EPA’s 1980 Regulatory Options for the Control of Odors notes that a study for

the health effects of odors/odorous emissions should be conducted to gauge the welfare and health of the environment and residents. Most odor problems come from agriculture and livestock, diesel, and incinerators. These regulations are difficult to enact or enforce because the nuisance level of each odor is relative to those who smell it. One of the levels to control odors is using NAAQS, as some odors come from hazardous substances⁹¹.

Meteorology and Pollution

Pollution levels are affected by meteorological events like wind speed and direction. Additionally, weather and solar radiation play a role in how pollutants spread and interact with their environment. By looking at meteorological events, people can predict pollution levels based on how emissions and chemicals interact with the weather, air pressure, wind speed and direction, and so on. Because of New Jersey's global position, it is affected by a variety of air streams, so that the weather each day is variable, which means so are the pollutant levels.



Climate

Prevailing Air Currents in New Jersey

According to the Office of the New Jersey State Climatologist (ONJSC) at Rutgers University, a “broad, undulating flow from west to east” dominates atmospheric circulation in the middle latitudes of North America, including New Jersey. “These ‘prevailing westerlies’ shift north and south and vary in strength during the course of the year, exerting a major influence on the weather throughout the State”.⁹² Most New Jersey areas experience 25 to 30 thunderstorms per year, with fewer storms near the coast than farther inland. About five weak tornados occur each year throughout the state.

Climate Zones

New Jersey is divided into five distinct climate regions or zones. Differences in geology, distance from the Atlantic Ocean, and prevailing atmospheric flow patterns produce distinct variations in the daily weather between each of these regions. According to the ONJSC publication, “The Climate of New Jersey”, Edison is in the Central climate zone, which runs from the New York Harbor to the Delaware River near Trenton. Due to the urban nature of this region, large quantities of pollutants are produced by a high volume of automobile traffic and industrial waste. Furthermore, the high concentration of buildings and paved surfaces helps retain more heat, thus affecting the temperature. This is commonly referred to as the “heat island effect.” The Central Zone experiences approximately 15-20 days annually at 90°F or higher.⁹³ (**Figure 11**).

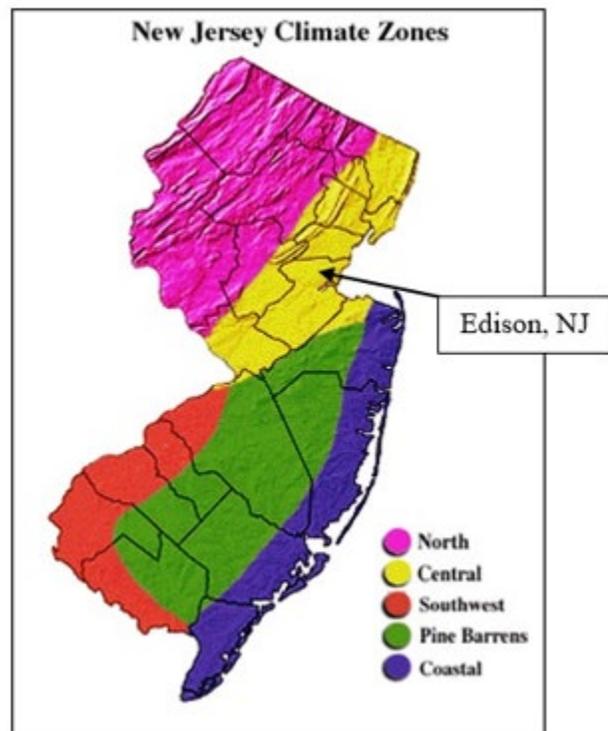


Figure 11. New Jersey Climate Zones

Temperature and Precipitation

The ONJSC maintains temperature and precipitation data from monitoring stations throughout the state, with some records dating back to the 1890s. The state is divided into three divisions, with Edison falling under Division 2. The northern side of this zone marks the border between freezing and non-freezing precipitation, while the southern edge has twice the number of days with temperatures higher than 90 degrees.

State Historic Averages

Data from 1895 through 2012 for New Jersey statewide mean annual temperatures and annual precipitation along with yearly cooling and heating day totals for New Jersey from 1890 to 2012 have been collected and graphically represented to show a comparison and historical trend for the state's climate. This data is represented in *Figure 12*, *Figure 13*, *Figure 14*, and *Figure 15*; which show an overall upward trend in mean temperature and precipitation for New Jersey between 1895 and 2012, as well as an increase in yearly cooling degree days and a reduction in annual heating degree days. The ONJSC records an average of 163 “freeze-free” days in the north, 179 in central Jersey and southern Jersey, and 217 at the coast. The normal heating degree days, reported by the Northeast Regional Climate Center, are on a base of 65 degrees.⁹⁴

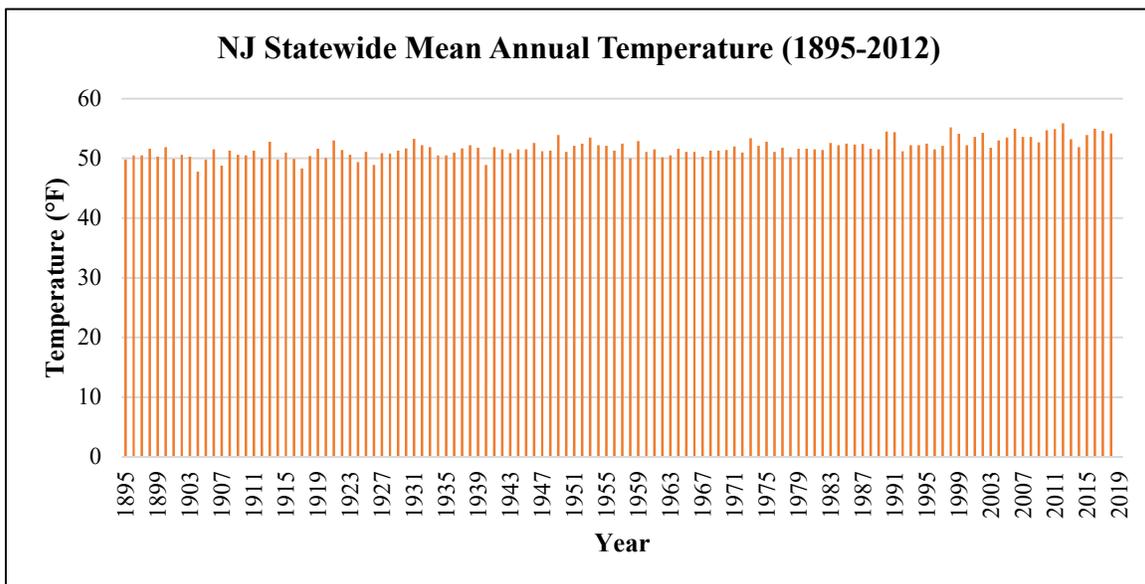


Figure 12. Statewide Mean Annual Temperature (1895-2018)

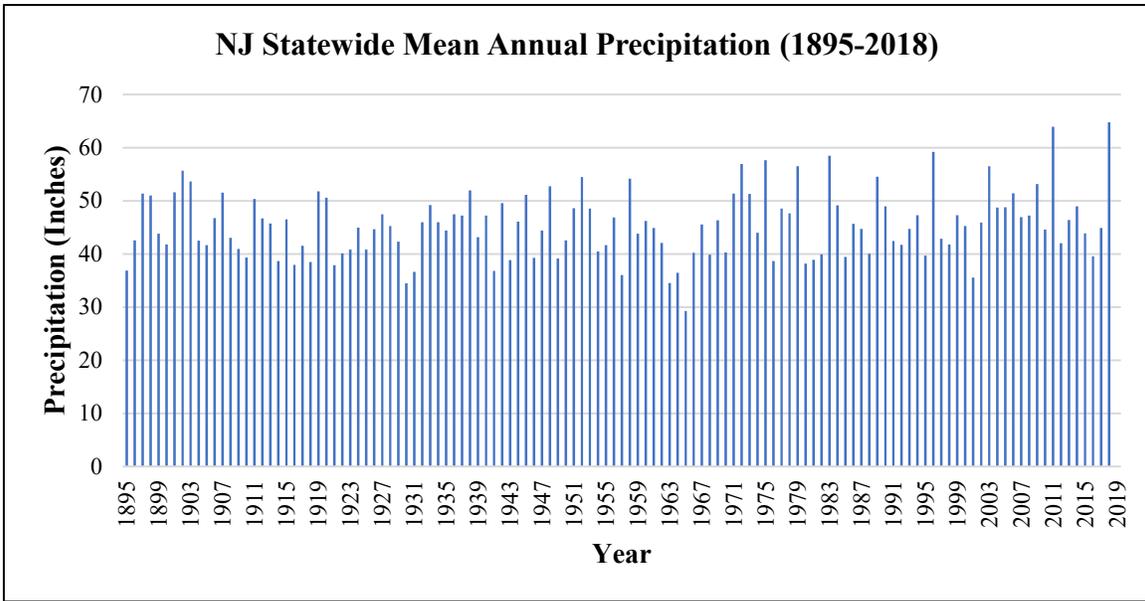


Figure 13. NJ Statewide Mean Annual Precipitation (1895-2018)

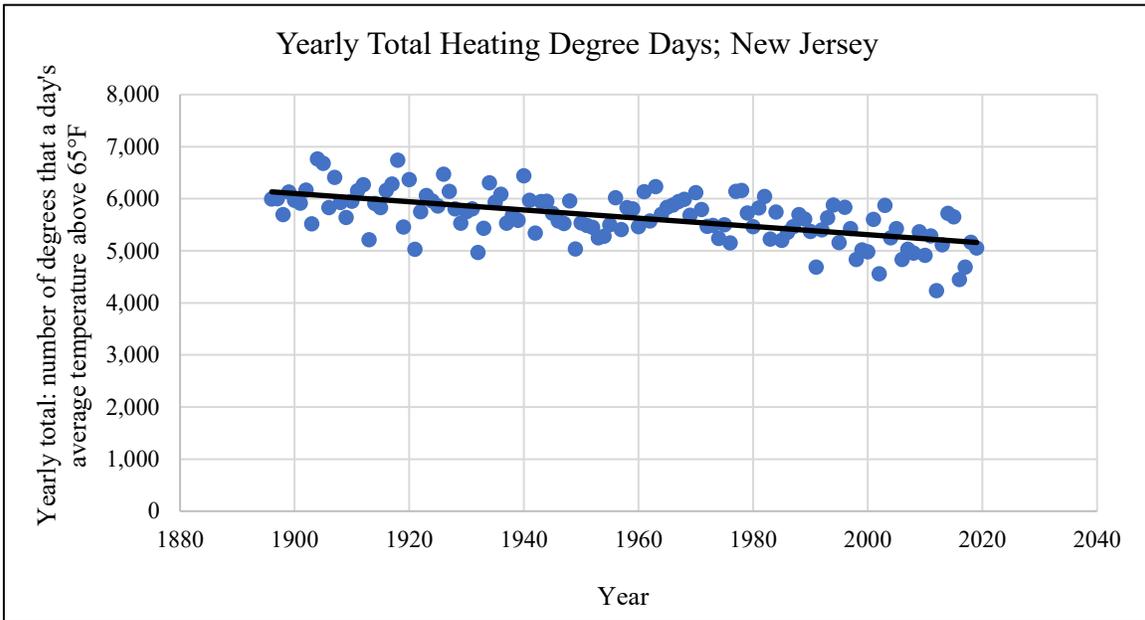


Figure 14. Yearly Total Heating Degree Days

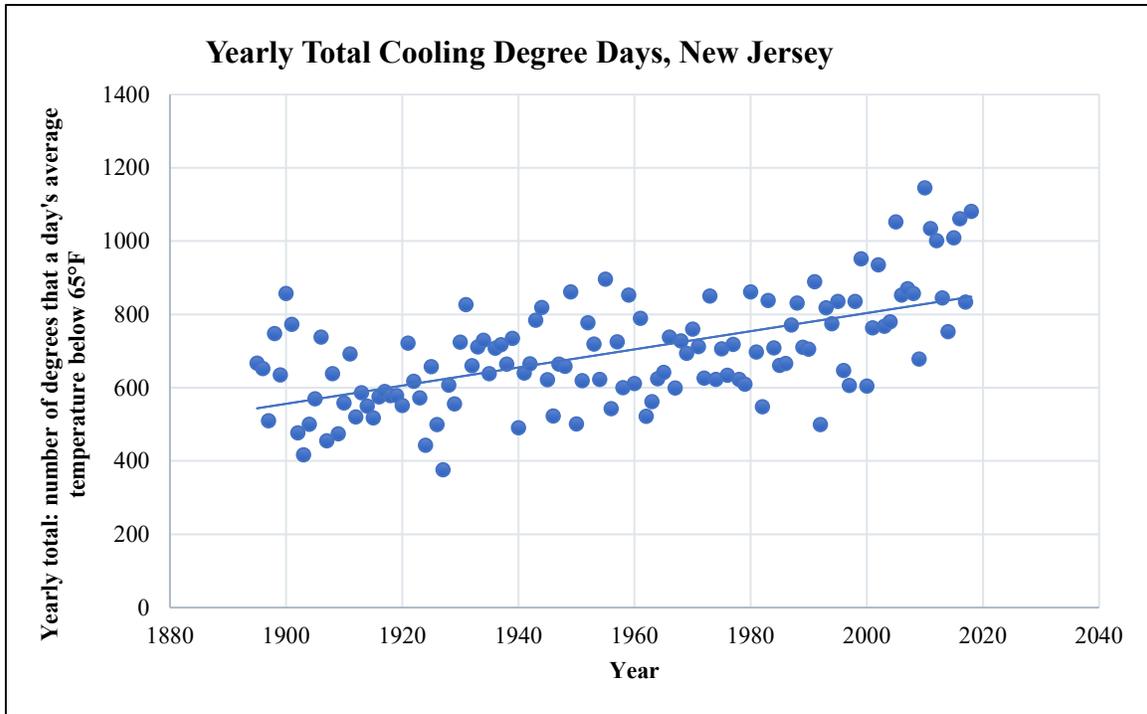


Figure 15. Yearly Total Cooling Degree Days

Local Historic Temperature Averages

The closest ONJSC reporting station to Edison is New Brunswick.⁹⁵ This monitoring station tracks a variety of climate factors, including monthly and annual temperatures and precipitation. **Table 37** includes monthly and annual temperature averages recorded at the New Brunswick monitoring station. The New Brunswick station has been monitoring temperatures since 1893. The historical average annual mean of temperatures is 52.9°F.

Table 37. Monthly and Annual Average Temperatures: New Brunswick (°F)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	30.6	31.7	40.4	50.8	61.1	69.8	74.8	73.0	66.5	55.3	44.8	34.5	52.9
Median	30.7	32.1	40.4	50.8	61.2	70.1	74.6	72.9	66.3	55.3	44.5	34.9	52.8
Min	19.5	17.7	31.2	44.8	53.9	64.0	71.1	67.5	61.3	49.2	39.5	22.6	49.1
Max	42.9	39.7	50.5	57.5	66.1	75.2	79.7	77.7	72.0	62.4	50.6	48.6	55.9
<i>Source: New Jersey Office of the State Climatologist</i>													

Local Historic Precipitation Averages

Table 38 details the monthly and annual averages for precipitation (in inches) at the New Brunswick monitoring station. The historic annual mean precipitation is 46.13 inches. A breakdown of precipitation averages by month is also included. **Table 39** details the historic monthly and annual snowfall. The annual historic mean snowfall is 25.9 inches.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	3.44	3.01	3.81	3.75	4.02	3.91	4.85	4.68	4.05	3.53	3.47	3.75	46.13
Median	3.04	2.68	3.53	3.24	3.90	3.50	4.34	3.92	3.28	3.17	3.14	3.48	45.71
Min	0.50	0.64	0.75	0.65	0.29	0.02	0.68	0.76	0.04	0.25	0.34	0.17	27.51
Max	9.18	6.67	11.13	12.38	9.38	10.04	11.17	17.43	12.68	12.32	8.72	9.91	66.11

Source: New Jersey Office of the State Climatologist

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	7.2	8.2	4.4	0.8	0.0	0.0	0.0	0.0	0.0	0.1	0.6	4.9	25.9
Median	5.1	5.7	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	23.0
Min	T	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Max	31.2	37.4	20.5	10.5	T	T	T	T	T	3.0	12.0	23.1	76.5

T = trace (<0.1")
Source: New Jersey Office of the State Climatologist

Extreme Phenomena

Tropical Cyclones and Storms

According to the National Oceanic and Atmospheric Administration (NOAA), tropical cyclones are rotating, organized systems of clouds and thunderstorms that originate over tropical or subtropical waters.⁹⁶ Tropical cyclones have four major levels, increasing in severity: tropical depression, tropical storm, hurricane, and major hurricane. Storms may start as major hurricanes and weaken in strength as they travel and make landfall. The season generally runs from spring through fall, with most activity for the Mid-Atlantic States occurring in August and September. Tropical cyclones tend to bypass New Jersey due to its protective location slightly to the west of coastal outcrops to the north and south. When the storms affect New Jersey, they are more apt to affect coastal areas, although a few have traveled inland.

Notable recent tropical cyclones are Hurricane Floyd in September 1999, Hurricane Irene in August 2011, and Hurricane Sandy in October 2012. Edison received between 7.5 and 10 inches of rain during Irene, according to the Northeast Regional Climate Center⁹⁷. During Hurricane Sandy in 2012, Edison received between 1 and 1.5 total inches of rain.⁹⁸

Other recent tropical cyclones affecting New Jersey:

2010 – Tropical Storm Hanna took an inland track.

2004 – Several tropical storms and depressions affected the East Coast but missed inland Northern New Jersey.

2000 – A tropical depression from Hurricane Gordon affected coastal New Jersey.

1999 – Hurricane Bret clipped the New Jersey coast in September at a Tropical Storm level.

1996 – Hurricane Josephine downgraded to a tropical storm hit inland in October.

1994 – A tropical depression traveled west and north of New Jersey.

- 1992 – Tropical Storm Earl traveled south and west of New Jersey.
- 1988 – Tropical Storm Chris traveled west to east through Northern New Jersey.
- 1985 – Hurricane Gloria skirted the coast of New Jersey.

In 2019, the frequency of tropical storms was above the 1981-2010 average of 12.1, with 18 named storms forming (6 of which were hurricanes, and three major hurricanes). The 2019 season had an Accumulated Cyclone Energy (ACE) index (duration and strength) of about 25% above the 1981-2010 average and the 15th highest since 1981. The 2019 season saw two Category 5 hurricanes in Dorian and Lorenzo. Dorian’s winds were among the strongest of any Atlantic hurricane in history before it hit the Bahamas as a Category 5 hurricane.⁹⁹ In 2019 there were no weather-related disasters in New Jersey costing over one billion dollars.¹⁰⁰

The National Climate Assessment also takes note of other storms that frequently occur in the Northeast. Ice storms, floods, droughts, and heatwaves are likely occurrences, as are storms forming in the Atlantic Ocean that carry inland¹⁰¹. Nor’easters are a unique type of storm that is common in the Northeast. They are named for the low-pressure systems, often impacting states in New England and the Mid-Atlantic region. Nor’easters are caused by strong northeasterly winds blowing from the ocean over coastal areas. These storms occur between September and April. The Northeast region is at risk of hurricanes during the Atlantic hurricane season, which is between June and September.¹⁰²

Landslides

Landslides in New Jersey have generally occurred in the northern and central parts of the state and include slumps, debris flows, rock falls, and rockslides. They are not as common in New Jersey as in other parts of the country. As of July 2018, there were approximately 298 landslides in New Jersey, as reported by the NJDEP.¹⁰³ Of the 298 landslides recorded in New Jersey from 1887 to 2018, 13% (39) occurred during the heavy rains of Hurricane Irene in August 2011. As of 2018, no landslides have occurred in Edison.

Earthquakes

The NJDEP maintains a database of recorded earthquakes in New Jersey, with more than 207 as of April 2019.¹⁰⁴ They occur more frequently along the fault lines in north-central New Jersey than in other parts of the state. These earthquakes are typically minor in nature, often registering in the category of micro-quakes. The strongest earthquake epicentered in New Jersey, with a magnitude of 5.3, occurred in 1783, just north of present-day Picatinny Arsenal in Rockaway Township. The strongest earthquakes *felt* in New Jersey had a magnitude of 8.0-8.8 and were epicentered in New Madrid, Missouri in 1811-1812. An earthquake epicentered in Virginia was felt in New Jersey in August 2011.¹⁰⁵ NOAA’s website indicates the closest area that tests for earthquakes is New York, in which there was most recently an earthquake in 2002. During this earthquake, there was minimal damage, costing under one million dollars.¹⁰⁶ There has not been a registered earthquake in Edison.

In New Jersey, damage from earthquakes is rare or minor. The baseline for the hazard ranking is the level of horizontal shaking that have a 2-in-100 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of the acceleration of a falling object due to gravity. Maps available from the USGS can “form the basis for seismic design provisions of building

codes, insurance rate structures, earthquake loss studies, retrofit priorities, and land-use planning.”¹⁰⁷

Earthquakes are measured by magnitude, intensity (level of shaking), and depth to hypocenter. Magnitude measures the relative size and energy released (when one block or rock, along a fault line, slips over another, causing the ground to vibrate).¹⁰⁸ The magnitude scale begins at 0, and the highest magnitude ever recorded was 9.5. Of the 207 earthquakes recorded in the database, 59% had a magnitude of 2 or less and are considered “micro earthquakes.” **Table 40** shows the magnitude summary.

Table 40. Magnitude Summary for Earthquakes in New Jersey		
Range	Count	% of Total
<2.0	122	59%
2.0-3.0	72	35%
3.1-4.0	11	5%
4.1-5.0	1	0.5%
>5.1	1	0.5%
Total:	207	100%
<i>Source: NJDEP¹⁰⁹</i>		

Generally, the intensity of an earthquake relates to its magnitude, with a higher level of intensity occurring at or near the epicenter of a higher magnitude earthquake. The intensity scale ranges from I to VIII or higher. Intensities of VI (felt by all, frightening but damage is slight) or VII (damage negligible in buildings of good design and construction) are generally associated with a magnitude in the 5 range. Intensities of IV (felt by nearly everyone; some shaking, cracking of walls, standing cars rocked) or V (felt by everyone) are generally associated with magnitudes in the 4 range.

Another earthquake measurement is the depth below the surface at which the hypocenter occurs. The hypocenter is the point in the earth where the rupture starts, and the epicenter is the point at the earth’s surface directly above the hypocenter. Depth levels are grouped as shallow, 0-70 km deep; intermediate, 70-300 km deep; and deep, 300-700 km deep. All earthquakes in New Jersey have a shallow depth to hypocenter, with the deepest recorded hypocenter at 25 km below the surface for an earthquake near Sussex in northwestern New Jersey in 1969. The highest annual count of earthquakes was 13 in 1984, and no earthquakes were reported in either 1985 or 2000. The strongest earthquake recorded within 10 miles of Edison was near South Amboy, Middlesex County, in 1895, with a magnitude of 4.1 recorded.

Climate Change

In 2007, the Intergovernmental Panel on Climate Change (IPCC) reported that increasing carbon dioxide (CO₂) emissions into the atmosphere, because of human activity, has warmed the Earth’s surface by more than 1.3°F during the last century. The Union of Concerned Scientists has indicated that temperatures in the northeast are likely to rise in winter and summer over the next several decades. Without a reduction in CO₂ and other Greenhouse Gas (GHG) Emissions,

average temperatures may rise by up to 14°F in the summer by 2100. Studies have predicted that by the end of the century, the New York City region and cities such as Trenton could experience more than 20 days per summer with temperatures above 90°F.¹¹⁰

The National Centers for Environmental Information noted that 2018 was the fourth warmest year on record dating back to the mid-1800s.¹¹¹ 2017 was the second warmest year on record behind 2016. Sea surface temperatures were also near-record high. Sea surface temperatures have cooled slightly since the record El-Niño in 2016, but 2018 temperatures were recorded at 0.33 °C above the 1981-2010 mean.¹¹² Of importance is the temperatures trends, as 2018 itself is the 42nd consecutive year with both land and ocean temperatures above the average for the century. Since the 21st century began, these temperatures for land and ocean have broken records five times, three of which happened consecutively, from 2014-2016.^c

According to the NJDEP, indicators of climate change in New Jersey include rising temperatures, increased rainfall, more frequent extreme weather events, and rising sea-levels. Records of average annual temperatures show a 2.2°F increase since 1900. The most rapid warming in New Jersey has occurred since 1999, with 2012 being New Jersey's warmest year on record. In the past 100 years, there has been a 9% increase in precipitation, with most additional precipitation occurring during the fall and spring. The wettest year on record for New Jersey is 2011. Additionally, the frequency of extreme weather events has increased by 74% over the past century in the Northeast region. New Jersey is projected to experience sea-level rise between 0.9 and 2.1 feet by 2050. Sea-level rise along the coast has increased by an average rate of 1.5 inches per decade, which is 2x the global rate of sea-level rise.¹¹³

This warming trend can impact the health of humans and the environment. The predicted effects on humans include heat stress, increased particulates in the air, and increased occurrences of insect-spread diseases such as the West Nile Virus in the winter season of northern climates. Ecosystem repercussions include changes to the water cycle, with the following potential consequences: loss of critical habitat, further stressing some already threatened and endangered species; impacts on water supply and agriculture; more intense rain events; more frequent periods of extended dryness; and increases in fires, pests, disease pathogens, and invasive weed species.¹¹⁴

2018 Mid-Atlantic Forest Ecosystem Vulnerability Assessment

In October 2018, the USDOA Forest Service produced a report that studies the impact that climate change will have on the Mid-Atlantic region that covers 60 million acres, including New Jersey, Pennsylvania, Delaware, and most of New York and Maryland. This assessment states that the annual average temperature has increased by 1.8°F since 1901. This increase is felt more along the coast as the average temperature has warmed by more than 4°F in certain locations. This report outlines a low climate scenario in which the climate change projections are made with the lowest projected impact and a high climate scenario in which the highest projected impacts are used in future predictions. Under each of these projections, temperatures are expected to increase anywhere from 1°F to 10°F, and the region should expect increases in precipitation in winter and spring. In addition to increased precipitation, studies project more

^c "Reporting on the State of the Climate in 2018" was used because the report for 2019 was not released at the time of the making of this document.

frequent heavy rain events (1-inch to 3-inch) rain events, as well as increased risk of drought as increased temperature will increase rates of evaporation and transpiration. Other impacts that the Mid-Atlantic region will experience are an increased risk of wildfires. Tree regeneration and recruitment will be also affected by changing conditions, as suitability for southern species will increase, suitability for northern species will decline, and damage from invasive plants, pests, and pathogens will increase.

Greenhouse Gases

A Greenhouse Gas (GHG) is defined by the NJDEP as:

“an atmospheric gas that slows the rate at which heat radiates into space, thus having a warming effect on the atmosphere. GHGs include water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide, chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), and some other halogenated gases.”¹¹⁵

To address the effects of GHGs, New Jersey enacted the Global Warming Response Act in 2007. This law requires:

- Stabilization of statewide GHGs to 1990 levels by 2020, and
- A further reduction to 80% below 2006 levels by 2050

According to the NJDEP, New Jersey must meet these limits to avoid the most damaging impacts of climate change. In 2012, the latest year for which major sector estimates are available, total estimated emissions were 104.6 million metric tons of CO₂ equivalent (MMTCOe), below the 1990 baseline and 2020 target of 125.6 MMTCOe. The 2050 goal is much more ambitious: to be 80% below the 2006 level or approximately 25.5 MMTCOe.

In December 2011, the state revised its *Energy Master Plan* and released an updated draft in December 2015. The state *Energy Master Plan* is the strategic vision for the use, management, and development of energy in New Jersey over the next decade. Because fossil fuels such as coal, oil, and natural gas are the largest source of GHGs in the state, the *Energy Master Plan* serves as the platform for discussions about how New Jersey can meet the Global Warming Response Act’s 2050 greenhouse gas limit.¹¹⁶ On May 23, 2018, Governor Phil Murphy signed an Executive Order for the Energy Master Plan Committee to undertake an update to the 2015 Plan.¹¹⁷

The transportation sector continues to be the major contributor to GHGs (44% in 2012), and vehicle miles traveled continue to increase while fuel efficiencies have leveled off. In 2012, electricity generation was the second largest contributor at approximately 20%, followed by residential at 11%, commercial at approximately 10%, and industrial at approximately 10%, combining for 31% of gross statewide emission. Highly warming gases, waste management, and land clearing contributed approximately 12%, while terrestrial carbon sequestration (forests absorbing carbon) provided an offset of -7.9%.¹¹⁸

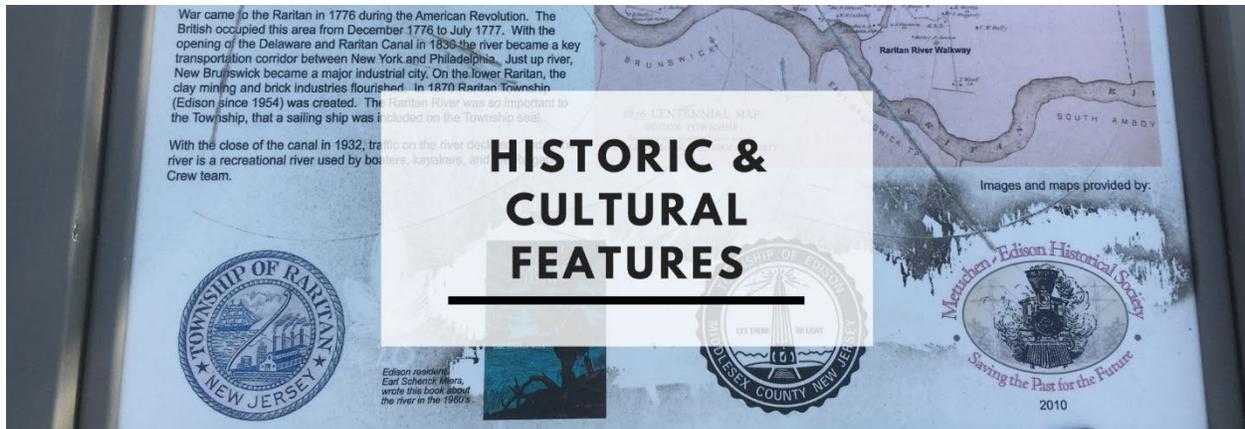
Clean Energy Initiatives

On an individual level, rebates on energy-efficient alternatives for household appliances, heating, cooling, and alternative energy systems are available through New Jersey’s Clean Energy

Program (NJCEP), which are administered by the New Jersey Board of Public Utilities. Commercial, industrial, and local government programs are also available.¹¹⁹

Clean energy initiatives in Edison help reduce greenhouse gas emissions and build resilience to the impacts of climate change. These initiatives are sustainability actions that contribute to Edison's Sustainable Jersey certification. Since 2007, Edison has sought and obtained grants to fund retrofits, which improve the energy efficiency of municipal facilities. Some projects include improving the energy-efficiency of heating at the Edison Municipal Animal Shelter, the replacement of HVAC units at the Minnie E. Veal Community Center, and replacement upgrades for NG Circulating Hot Water and Forced Hot Air Furnaces, Lighting and Fuel Controls for Edison's public libraries. Edison additionally used a \$41,000 NJCORE Solar Energy Subsidy from NJ Board of Public Utilities to install a 10kW PVSE system on the roof of Edison Municipal Animal Shelter.

Edison's participation in the Smart Workplace Awards Program by Keep Middlesex Moving has led to establishing one of the largest municipal fleets of hybrid vehicles in New Jersey and bus services for Edison Senior and Challenged Adult Residents.



Historic and Cultural Features

Settlement in the areas that now comprise Edison Township began in the late 1600s. Edison is a significant place in Revolutionary War history, as it was the location of the Battle of the Short Hills in 1777. Originally incorporated from parts of Woodbridge and Piscataway as Raritan Township in 1870, Edison has a rich local history, including notable structures, sites, and roads. Most notably, Edison Township is the home of Thomas Edison’s laboratory, where Edison invented the phonograph, the electric railway, and the incandescent lamp. Christie Street, where Edison’s lab was located, was the first street in the world to be lit up at night. At the time that Edison lived in Menlo Park in the late 1870s, Raritan Township was mostly rural. According to the Edison Township website, “From a rural-residential community in the 1920’s, Edison has grown in population and industry. It ranks as the fifth-largest municipality in New Jersey.”¹²⁰ Modern-day Edison has a population of over 100,000 and is a major hub for transportation through New Jersey and to and from New York.

Local Historic Resources

Metuchen Edison Historical Society

The Metuchen Edison Historical Society provides public education about the history of Edison and Metuchen Townships. Their website includes information, archive photos, and a local history store. The society also runs events such as Local History Day and participates in the Middlesex County Fair.¹²¹

Middlesex County Office of Arts & History

The Middlesex County Office of Arts & History guides investment of significant resources in the County’s arts, culture, and history assets for the benefit of all residents. The division provides cultural programming, educational workshops, and folklife projects throughout all municipalities that promote diverse cultural values, goals, and traditions of local communities, the state, and the nation.¹²²

Community Education and Outreach

The Edison Greenways Group holds annual Eco-Tours of Edison, organized jointly by Edison Greenways Group, Inc. and the Edison Wetlands Association. The tours visit local environmental and historical sites throughout the Township for education, clean-up,

preservation, and advocacy. The Township of Edison received 10 points towards its Sustainable Jersey Certification for Eco-Tours as well as other outreach initiatives.

Historic Sites and Landmarks

There are several historic landmarks and sites in Edison Township. These include sites listed on the National Register and or State Register through the State Historic Preservation Office (SHPO) and those locally important sites identified in the Edison Township Master Plan. **Table 41 State & National Register Sites in Edison** lists the sites identified on the National and State Registers.

Table 41. State & National Register Sites in Edison Township¹²³				
Historic Site	Location	National Register	State Register	SHPO Opinion
Camp Kilmer Military Reservation Historic District	Piscataway Township; Edison Township			9/22/1988
Edison Facility (Raritan Arsenal)	Edison Township; Woodbridge Twp..			7/15/1992 ID#4527
Thomas A. Edison Memorial Tower	37 Christie Street	11/30/1979 Reference Number: #79001505	10/9/1979	
Homestead Farm at Oak Ridge	Oak Ridge Golf Club	10/25/1995 Reference Number: #95001185	9/8/1995	
Laing House of Plainfield Plantation	1707 Woodland Avenue	10/27/1988 Reference Number: #88002124	3/23/1988	
Oak Tree Engagement Site (Battle of the Short Hills)	Oak Tree Road and New Dover Road			3/23/2001
Public Service Electric & Gas Metuchen Sub-Station	Pierson Avenue			5/3/2012
Roosevelt Hospital	1 Roosevelt Drive	3/5/2002 Reference Number: #02000109	1/9/2002	COE: 1/9/2001*
Short Hills Battlefield Historic District	Edison Township, Woodbridge Township	5/9/2014 Reference Number: #14000203	2/12/2014	3/23/2001

Table 41. State & National Register Sites in Edison Township¹²³				
Historic Site	Location	National Register	State Register	SHPO Opinion
Benjamin Shotwell House	26 Runyon's Lane	6/4/1987 Reference Number: #87000875	4/28/1987	
St. James Episcopal Church	2136 Woodbridge Avenue			COE: 1/17/1990*
<i>Source: NJDEP Historic Preservation Office, New Jersey and National Registers of Historic Places (Updated 12/31/2019)</i>				

The following definitions are provided for the abbreviations and terminology used in the table:

NR: Listed on the National Register of Historic Places.

NR Reference #: National Register Information System (NRIS) database is available online from the National Parks Service.

SR: New Jersey Register of Historic Places (State Register)

Certificate of Eligibility (COE): issued by SHPO. For properties not already listed on the SR, a COE satisfies a prerequisite to apply for funds from the New Jersey Historic Trust, as well as several county preservation funding programs.

SHPO Opinion: This is an opinion of eligibility issued by SHPO in response to a federally funded activity that will influence historic properties not listed on the NR.

A brief description of the historic sites is below:

Camp Kilmer Military Reservation Historic District

Camp Kilmer Military Reservation was a staging area for troops chosen at the end of 1941 as the War Department anticipated World War II. It was a major transportation hub for soldiers traveling to and from the European Theater.¹²⁴

Edison Facility (Raritan Arsenal)

The Raritan Arsenal was established in 1918 during World War I on a large site along the north bank of the Raritan River to provide a storage and shipping terminal for military supplies, equipment, and munitions headed overseas.¹²⁵

Thomas A. Edison Memorial Tower

Built originally in 1938, Edison Memorial Tower is part of the Thomas Edison Center at Menlo Park, which is dedicated to Thomas Edison and his laboratory at Menlo Park. The tower was restored in October 2008.¹²⁶

Homestead Farm at Oak Ridge

First established 1720-1740, the Homestead Farm at Oak Ridge was made up of 208 acres of open lands and a farmhouse. Over the years, the outbuildings have been removed, and the farm converted to an 18-hole golf course.¹²⁷ Since 2009, the farmhouse has been closed, and the former golf course serves as a regional park for passive recreation by Union and Middlesex County residents.

Laing House of Plainfield Plantation

The Laing House of Plainfield Plantation is a colonial-era farmhouse and Quaker barn.¹²⁸

Oak Tree Engagement Site (Battle of the Short Hills)

The Oak Tree Engagement Site marks the location of a series of skirmishes, which occurred during the Battle of the Short Hills.¹²⁹

Roosevelt Hospital

Roosevelt Hospital was built during the Great Depression as the Middlesex County Tuberculosis Sanatorium. The hospital is a four-story, Colonial Revival building made of red brick and overlooks a scenic park. Roosevelt Hospital is a historical monument of the New Deal era.¹³⁰

Short Hills Battlefield Historic District

The June 26, 1777 Battle of the Short Hills occurred when British forces moved westward from Perth Amboy. The Continental Army met British forces a few miles north of Metuchen Meeting House. The battle resulted in an estimated 100 casualties on each side.¹³¹

Benjamin Shotwell House

Also known as Happy Valley Farm, the Benjamin Shotwell House was built by Benjamin Shotwell in 1775. It was added to the National Register of Historic Places in 1987.¹³²

St. James Episcopal Church

The St. James Episcopal Church building served as a hospital for wounded British soldiers during the war.¹³³

Edison State Park

While not listed on the State or National Registers, Edison State Park is in the Menlo Park section of the Township and covers 36 acres. The State Park has a rich history tied to Thomas Edison and his laboratories and the invention of the lightbulb. The park contains a two-room museum and trails.

Table 42 identifies the historic railroad districts and corridors in Edison Township:

Table 42. State & National Historic Railroad Districts and Corridors in Edison Township		
Historic Railroad Districts and Corridors	Locations	SHPO Opinion
Port Reading Historic District	Edison, Metuchen, Middlesex, Piscataway, South Plainfield, Woodbridge	SHPO 3/15/2002
Inch Lines Linear Multistate Historic District	Hunterdon County, Somerset County; Middlesex County (Edison Piscataway, South Plainfield, Woodbridge)	SHPO 8/31/1993
Pennsylvania Railroad New York to Philadelphia Historic District	Essex County, Hudson County, Mercer County, Union County; Middlesex County (Highland Park, Metuchen, New Brunswick, North Brunswick, Plainsboro, South Brunswick, Woodbridge)	SHPO 1/14/2015
Public Service Electric and Gas (PSE&G) Company Northern Inner Ring Transmission Line	Includes the Northern Inner Ring right of way from Metuchen Substation, through Roseland Substation, and on to Athenia Substation. Also includes right of way from Roseland Substation to West Orange Substation.	SHPO 12/31/2013
<i>Source: NJDEP Historic Preservation Office, New Jersey and National Registers of Historic Places (Updated 12/31/2019)</i>		

The Edison Historic Preservation Commission has identified additional locations as locally important historic resources:¹³⁴ (**Table 43**)

Table 43. Edison Township Locally Important Historic Sites	
Local Historic Resource	General Location
Piscatawaytown Burial Ground	Piscatawaytown
Piscatawaytown Commons	Piscatawaytown
Old Town Hall Site	Piscatawaytown (Now St.)
Old Town Hall	Piscatawaytown (B. 264-G, L 13-D)
Dunham House	Park Way
Raritan Engine Co. #1 (1 st Firehouse)	Menlo Park (Route 27)

Table 43. Edison Township Locally Important Historic Sites

Local Historic Resource	General Location
Piscatawaytown School	Piscatawaytown
Martin House (Old Post Road)	Piscatawaytown (30 Old Post Road)
Martin's Dock	Silver Lake Avenue/Raritan River
Player Avenue Theatrical City	Player Avenue
Stelton School	Stelton
Stelton Post Office Site	Stelton
Stelton Train Station	Stelton
Smalley Burial Ground (Camp Kilmer)	Camp Kilmer
Dunham Burial Ground	Baldwin Road
Dismal Swamp	Talmadge Road
Woodbrook Farms	Park Avenue & Talmadge Road
White Russian Settlement	Nevsky Street
Marconnier Chapel	Woodland Avenue
Old Oak Tree Firehouse	Oak Tree Road
Oak Tree Train Station Site	Oak Tree Road
Oak Tree School House	Marion Street
Oak Tree School	Oak Tree Road
Martin House*	New Dover Road
New Dover United Methodist Church	New Dover road
Potters Crossing/Elder Park	Grove Avenue
John P. Stevens Estate	Woodland Avenue
Robert T. Stevens Estate	Woodland Avenue
The Lehigh Valley Railroad	The Lehigh Valley Railroad
The Reading Railroad	The Reading Railroad
The Pennsylvania Railroad	The Pennsylvania Railroad
The Edison Copper Mine	Coppermine Brook, near Paris Avenue
The Thomas and Mary Edison Home	Lincoln Highway & Christie Street
Thomas Edison's Laboratory	Menlo Park
Menlo Park School (old schoolhouse)	Menlo Park
Sarah Jordan Boarding House Site (Christie St.)	Menlo Park
Thomas Edison's Office Electric Railway	Menlo Park
The Thomas Edison Electric Railway	Menlo Park to Pumpton
Francis Upton's House	Menlo Park
Carmen's Pond	Rt. 26 & Dellwood Rd. Menlo Park
Clara Barton School	Amboy Avenue
The Amboy Avenue Trolley	Amboy Avenue
Bloomfield Manor (Amboy Avenue)	Amboy Avenue & Woodbridge Ave.
Yelencics Homestead*	Woodbridge Avenue
Bonhamtown School	Bonhamtown (2825 Woodbridge Ave.)
Bonhamtown Hotel	Woodbridge Ave. (Victorian Manor)
Sand Hills School	King George Post Road
Lewis Nixon (Thomas A. Edison County Park)	Thomas A. Edison County Park

Table 43. Edison Township Locally Important Historic Sites

Local Historic Resource	General Location
The Lincoln Highway	The Lincoln Highway
Light Dispelling Darkness	Roosevelt Park
Roosevelt Care Center**	Roosevelt Park
John E. Toolan Kiddie Keep Well Camp	Roosevelt Park
Roosevelt Park	Roosevelt Park
Our Lady of Peace Church (and school)	Clara Barton (near Fords)
St. Margaret Mary Alacoque Roman Catholic Church***	Bonhamtown (B.281, L. 21)
Grace Reformed Church	Bonhamtown (B. 282, L. 1)
Old Post Road	Piscatawaytown/Bonhamtown
E. G. Gough House	2111 Woodbridge Avenue
<p><i>Source: Edison Municipal Master Plan (2003) and Personal Correspondence (2020)¹³⁵</i> <i>*these sites have been demolished</i> <i>**Site now senior apartments</i> <i>***Formerly St. Margaret Mary, now Iselin Christian Assembly</i></p>	

Memorials

There are two 9/11 memorials in Edison Township. Lake Papianni Park Memorial includes a sculpture of the towers and a fountain dedicated to eleven Edison residents lost in the terrorist attacks on September 11, 2001. The 9/11 Memorial Butterfly Garden at Martin Luther King Elementary School is dedicated to alumnus Scott Mitchell Schertzer.¹³⁶



Regional Relationships & Transportation

Regional Relationships

Middlesex County Comprehensive Plan

The Middlesex County Office of Planning is currently updating elements of its comprehensive plan, including land use, farmland preservation, open space and recreation, water resources, and the wastewater management plan. The Middlesex County Transportation Plan was most recently updated in 2014, and its goals include:

- Improve mobility and reduce traffic congestion
- Promote traffic safety
- Promote public transportation and intermodal improvements
- Maintain a state of good repair
- Provide an adequate and safe bicycle and pedestrian system that supports mobility and recreation
- Promote integration of transportation and land use
- Support freight transportation improvements
- Protect the environment and address energy conservation and climate change impacts on transportation
- Support economic vitality, access to jobs, and business appeal
- Promote public and private sector partnerships on transportation projects and programs

The Middlesex County Comprehensive Plan contains a Growth Management Plan, meant to encourage growth in already developed areas, rather than the few vacant areas. For growth management, Middlesex County is divided into five regions. Edison belongs to the Northeast region, along with Carteret, Highland Park, Metuchen, Perth Amboy, and Woodbridge. There is potential for this region to redevelop industrial sites into retail, office, and residential use.¹³⁷

North Jersey Transportation Planning Authority

Metropolitan Planning Organizations (MPOs) are a federally mandated and funded regional planning organization for metropolitan areas with a population of 50,000 or greater. Middlesex County is a subregion of the North Jersey Transportation Planning Authority, an MPO which

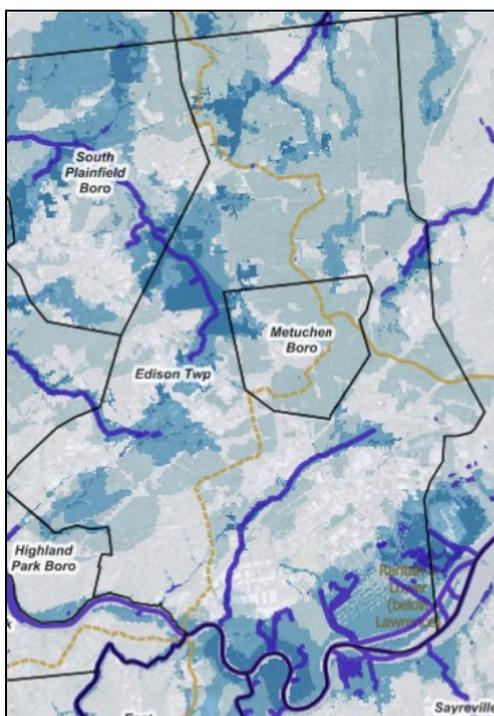
oversees metropolitan transportation planning for North Jersey’s population of 6.7 million. The mission of the NJTPA is to:

- Create a vision to meet the mobility needs of people and goods;
- Develop a plan for transportation improvement and management to fulfill the vision;
- Partner with citizens, counties, cities, state, and federal entities to develop and promote the transportation plan;
- Prioritize federal funding assistance to make the plan a reality; and
- Link transportation planning with safety and security, economic growth, environmental protection, growth management, and quality of life goals for the region.

Together North Jersey (TNJ)’s comprehensive plan for the counties included in the North Jersey subregion was written in 2015. The plan emphasizes the importance of regional planning to achieve mobility, transportation, and economic growth goals possible. The strategic action plan includes five priority goals:

- Grow a strong and inclusive regional economy
- Create great places
- Increase access to opportunity
- Protect the environment
- Work together

In Edison, goals for the Together North Jersey Comprehensive Plan include expanding access to the Middlesex Greenway. The Middlesex Greenway Access Plan was written to identify new connections for the Greenway within Edison, Metuchen, and Woodbridge for improved access to work, school, and public transportation through the Greenway.¹³⁸



Conservation Blueprint

The Nature Conservancy and New Jersey Conservation Foundation partnered with Rowan University to develop a mapping tool to assist local decision-makers and non-profit organizations in selecting properties for protection. Known as the Conservation Blueprint, this online, interactive mapping tool was developed as part of a collaborative effort to identify priority land rankings based on four themes: water quality to protect surface water and groundwater, ecology to support ecosystem health, community green space for recreation and connecting people to nature, agriculture to support farming.¹³⁹

Figure 16. Water Resource Priorities in Edison Township

Figure 16 identifies lands that are important for water and water resources. Areas in natural cover where water can recharge aquifers are highly ranked. Wetland areas are also favored in this ranking, along with floodplains and land areas

surrounding small headwater streams. In Edison, the highest priority area for water quality surround the Raritan River, Ambrose Creek, Mill Brook, Red Root Creek, South Branch Rahway River, Robinsons Branch, and Bound Brook.

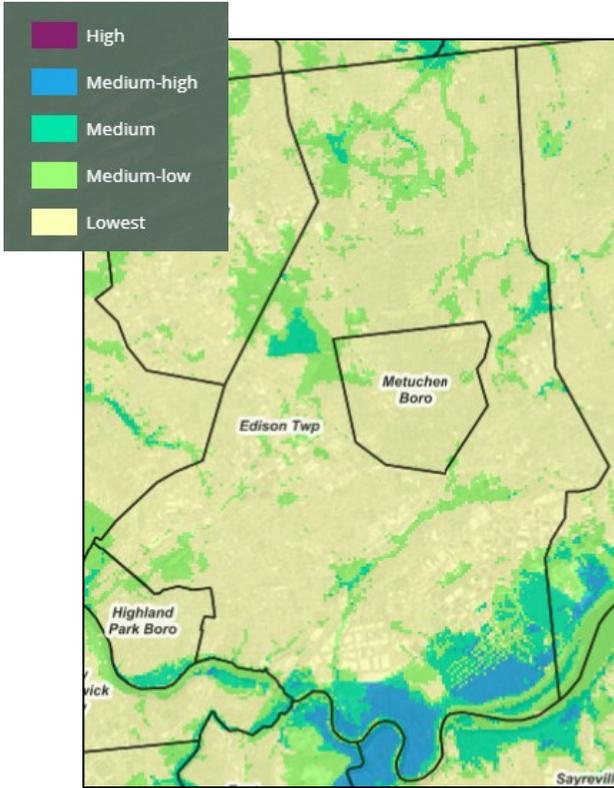


Figure 17. Ecological Integrity Priorities

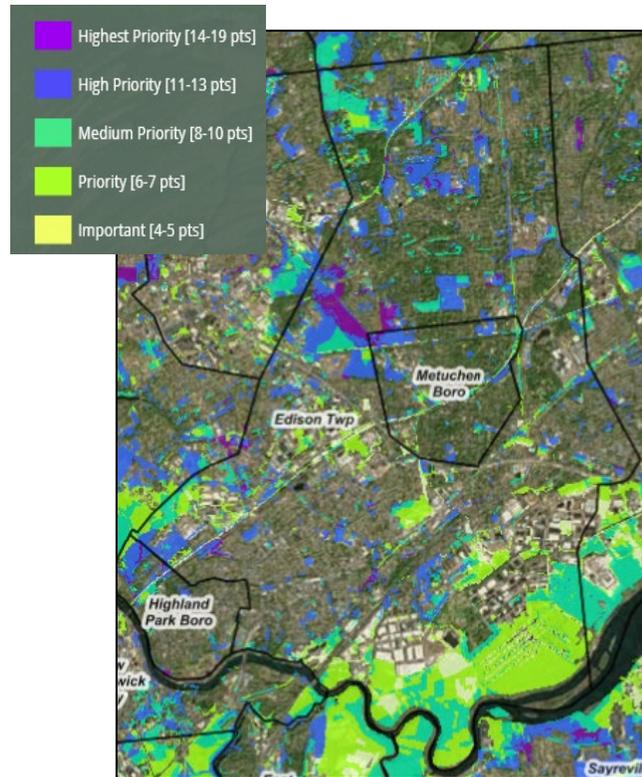


Figure 18. Community Green Space Priorities

Figure 17 shows lands that are important to protect for their significance to providing clean water, diverse habitats, and healthy ecosystems. In Edison, lands that surround the Raritan River, in the southern portion of the town, are ranked higher for ecological integrity.

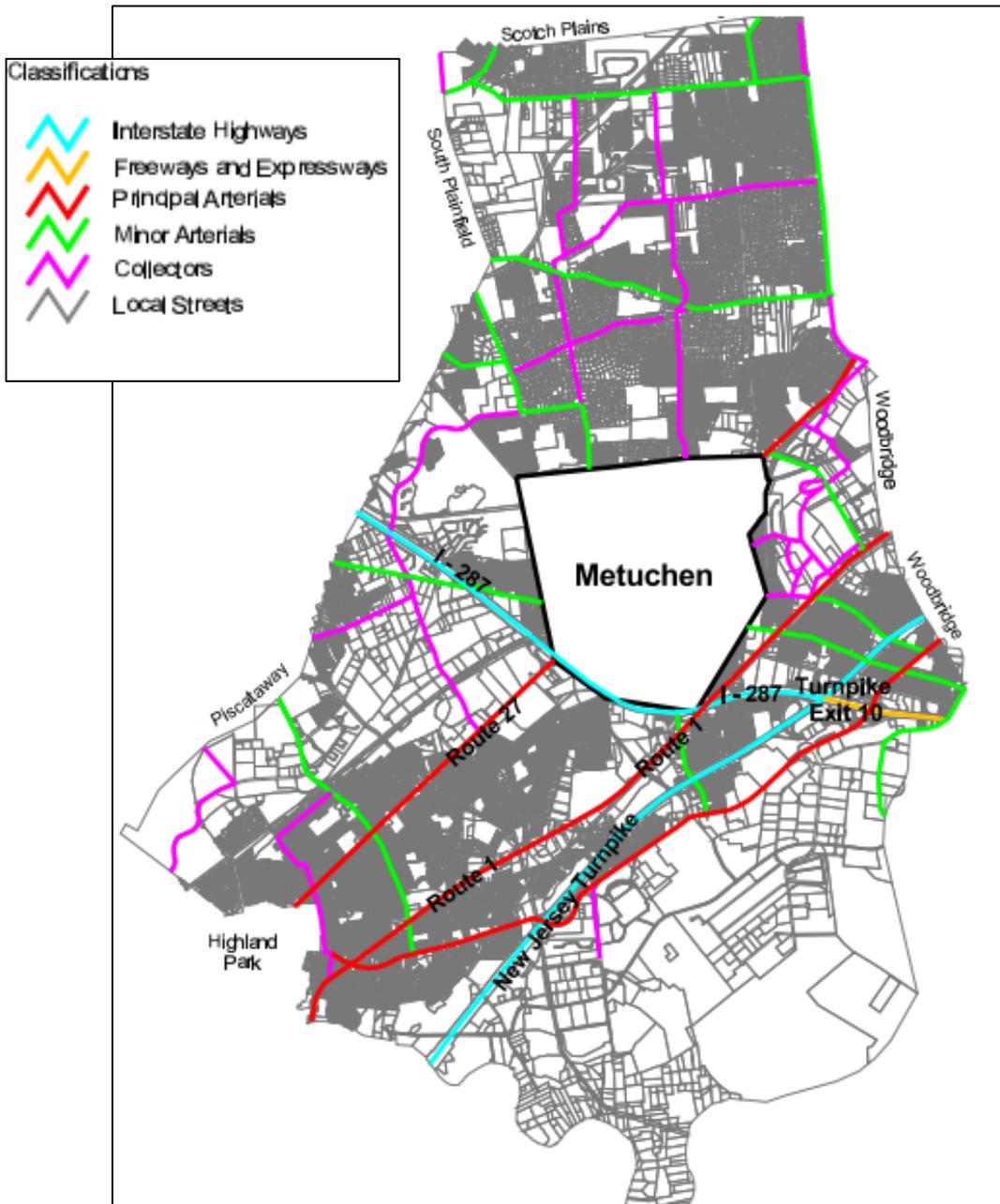
Figure 18 identifies lands that are important to protect the health of people, natural and agricultural lands close to people's residences, and undeveloped land in floodplains. Dismal Swamp, Earl Shenck Miers Park, Mill Road Park, Woodrow Wilson Middle School, and Beaver Crossing Park are among some of the high priority community green spaces in Edison.

Open Space

The goal of Edison Township's open space program is to promote stewardship of public lands and protect natural resources. Within Edison, there are 1,719 preserved acres, which account for 9% of the town's total land. The open space program looks to protect critical environmental resources, acquire additional lands for conservation and recreation, and develop municipal facilities to support these objectives.¹⁴⁰

Transportation

Like many New Jersey suburbs in the New York metropolitan area, Edison Township has a large commuter population and has been experiencing increasing traffic due to both population growth and dependence on automobiles. Edison’s municipal transportation system consists of passenger rail, NJ Transit and private carrier bus service, streets and highways, and bicycle and pedestrian circulation. Mass transit is the most widely used alternative to driving for commuters.¹⁴¹



Roadways
Edison Township classifies roadways into the following: Interstate, Freeways & Expressways, Principal Arterials, Minor Arterials, Collectors, and Local Streets.¹⁴² (**Figure 19**)

Interstates:
Interstate-287 (I-287) and the New Jersey Turnpike (I-95) cross through Edison Township, offering easy access to both highways. Exit 10 off I-95 is in Edison.

Freeways & Expressways:
A 5.15-mile segment of Route 440 links I-287 and the New Jersey Turnpike in Edison.

Figure 19. Roadway Classifications

Arterials carry large volumes of traffic at relatively high speeds and may connect to the interstate or highway network. Major arterials in Edison include Route 1 and Route 27. Route 1 runs from Highland Park Borough to Woodbridge Township. Route 27 also runs from Highland Park and passes through the center of Metuchen to Woodbridge Township.

Minor arterials in Edison include Oak Tree Road, Wood Avenue, Park Avenue, Central Avenue, New Durham Road, Plainfield Avenue, Main Street, Crows Mill Road, Parsonage Road, Old Raritan Road, Nevsky Street, Delancy Street, and Inman Avenue.

Collectors provide access and traffic circulation within residential neighborhoods, commercial, and industrial areas and connect local roads with arterials. Collector streets in Edison include Tingley Lane, Grove Avenue, New Dover Road, Plainfield Road, Stephenville Parkway, Wood Avenue, Talmadge Road, Woodland Avenue, Ethel Road, Cedar Lane, Kilmer Road, Suttons Lane, Oakwood Avenue, and Oak Drive.

The remaining roads of Edison are classified as local streets and provide access to residential neighborhoods and individual access roads.

Mass Transit

Edison is served by NJ Transit and AMTRAK on the Northeast Corridor Line. Edison has a station and is also served by the Metropark Station, located in Woodbridge, and the Metuchen Station. Bus service in Edison is primarily provided by NJ Transit. Metropark Station is serviced by several bus routes, including 62, 801, 802, 803, 804, and 805.

Bicycle & Pedestrian

The Middlesex Greenway is a 3.5-mile paved trail that runs through Edison, Metuchen, and Woodbridge. The greenway is suited for walking, jogging, and bicycling. No motorized vehicles are permitted on the greenway. Access points in Edison are located on Pierson Avenue, Jackson Avenue, Starkin Road, Liddle Avenue, Woodbridge Avenue, Dudash Park/May Street, and Wolf Avenue.

Keep Middlesex Moving

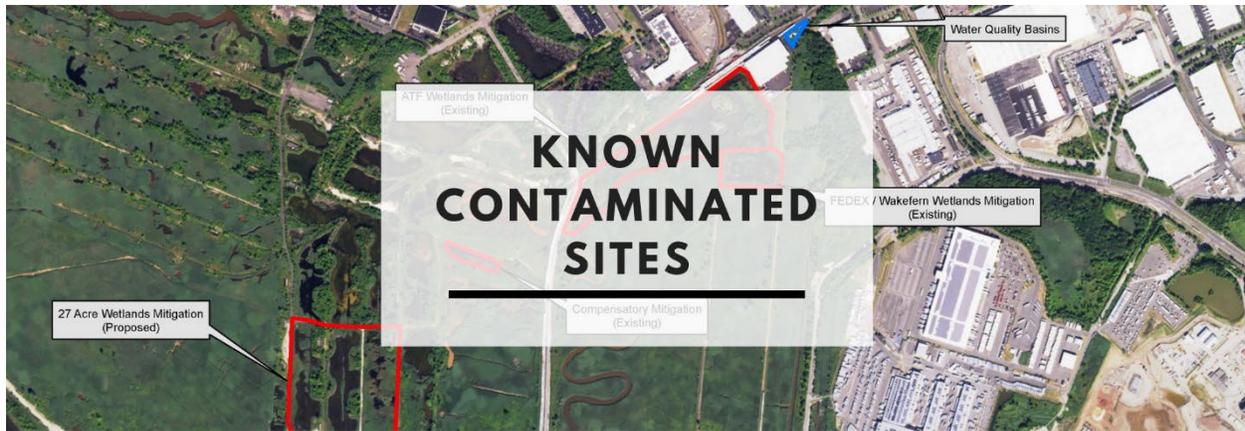
Keep Middlesex Moving (KMM) is a transportation management association that serves Middlesex and Monmouth Counties. Its goal is to improve mobility, reduce traffic congestion, and improve air quality. KMM works closely with Edison to operate the Edison Light Transit, a commuter shuttle that provides transportation to the Edison train station to reduce parking shortages.

Sustainable Jersey

Sustainable Jersey is a nonprofit organization that certifies actions taken by municipalities in New Jersey to reduce waste, cut greenhouse gas emissions, and improve environmental equity. The organization provides the tools, training, and incentives needed for municipalities to achieve sustainability actions. The certification program allows municipalities to score points based on sustainability achievements and gain a Bronze, Silver, or Gold Status.

Edison Township is a participating community that achieved “bronze level” certification in 2013, 2014, and 2017. Edison works to reduce its waste stream by providing a community paper shredding day, construction and demolition waste recycling, a recycling department, and a reusable bag education program. Additionally, Edison supports accessibility to locally grown food through its farmers market¹⁴³. Edison received 10 points towards Sustainable Jersey certification for involvement in Keep Middlesex Moving, along with other transportation programs meant to reduce carbon emissions. Edison addressed sustainability actions within eight categories in 2017: (*Table 44*)

Table 44. Sustainable Jersey Actions, Township of Edison		
<i>Category</i>	<i>Action Item</i>	<i>Points</i>
Community Partnership & Outreach	Create Green Team	10
	Community Education and Outreach	10
Diversity and Equity	Lead Education and Outreach Programs	10
Energy	Energy Efficiency for Municipal Facilities	15
	Municipal On-Site Solar System	10
Food	Community Gardens	10
	Farmers Markets	10
Health & Wellness	Building Healthier Communities	20
Land Use & Transportation	Smart Workplaces	10
Natural Resources	Natural Resource Inventory	20
	Environmental Commission	10
	Environmental Commission Site Plan Review	10
	Tree Protection Ordinance	10
Waste Management	Community Paper Shredding Day	5
	Construction and Demolition Waste Recycling	10
	Recycling Depot	10
	Reusable Bag Education Program	5
Total Points:		185
<i>Source: Edison Township Sustainable Jersey Community Certification Report, 2017¹⁴⁴</i>		



Known Contaminated Sites

Classification Exception Areas (CEAs)

Groundwater quality is impacted by overlaying land use. According to the USGS, “Industrial discharges, urban activities, agriculture, groundwater pumpage, and disposal of waste all can affect groundwater quality.”¹⁴⁵

In Edison, Classification Exception Areas (CEA) are designated in accordance with N.J.A.C. 7:9-1.6 and 1.9(b), which references the New Jersey Groundwater Quality Standards (NJGWQS). CEAs designate lands where specific contaminants have exceeded existing standards. CEAs provide notice that constituent standards for a given aquifer classification are not or will not be met in a localized area due to natural water quality or anthropogenic influences. Designated aquifer uses are suspended in the affected area for the term of the CEA.

The Kin-Buc Landfill is a Superfund site, which is described by the EPA:

“The 220-acre site is composed of an inactive landfill that operated from the late 1940s to 1976. From 1971 to 1976, the site was a State-approved landfill for industrial and municipal wastes, both solid and liquid. It accepted hazardous waste during this period, until the State revoked its permit in 1976 due to the violation of several environmental statutes. The Kin-Buc Site includes two major mounds, referred to as Kin-Buc I and Kin-Buc II, and one minor mound, referred to as Mound B. Site activities included the burying and compaction of contained wastes in Kin-Buc II, and the discharging of hazardous liquid wastes into bulldozed pits at the top of Kin-Buc I. Historically, aqueous and oily leachate seeped from the landfill into the adjoining wetlands, contaminating them with PCBs. The site was listed on EPA’s National Priorities List in 1983. To date, all remedial actions at the site have been completed, and operations and maintenance is ongoing.”¹⁴⁶

A site inspection in November 2018 determined that all landfill caps were well maintained and in good condition. Wells at the site were also deemed to be in good condition and were locked and labelled appropriately.¹⁴⁷ The NJDEP lists part of this site as a CEA under traditional case oversight by the NJDEP.

Appendix L and *Map 14* identify the CEA/Wellhead Restriction Areas in Edison Township.

Soil and Groundwater Contamination

Soil and groundwater contamination are tracked by the state and federal government for the following type of sites and locations:

- ✓ Brownfields – Extensive, long-term remediation sites;
- ✓ Community Right to Know program locations – Point Source facilities that require ongoing, continuous monitoring; and
- ✓ Known Contaminated Sites – Point source occurrences that are specific and limited.

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

According to the Site Remediation Environmental Trends Report completed by the NJDEP, between 1979 and 2010, a total of 53,000 contaminated sites were remediated in New Jersey. Since 2012, when the LSRP program was fully implemented, there has been an average of 4,637 sites remediated per year. Today, more sites are being cleaned up than ever before, and the process has become much more efficient under LSRP supervision.¹⁴⁸

The list of Known Contaminated Sites (non-homeowner) is included in *Appendix M*, shown on *Map 16*, and described below by type.

Brownfields

A brownfield is “any former or current commercial or industrial site, currently vacant or underutilized and on which there has been, or there is suspected to have been, a discharge of a contaminant.”¹⁴⁹ New Jersey encourages municipalities and counties to redevelop their brownfields as part of Smart Growth initiatives. According to the State Brownfield SiteSmart, there are 103 currently listed brownfields in Edison Township.

Community Right to Know

The Community Right to Know (CRTK) program is responsible for collecting and disseminating data on hazardous substances produced, stored, or used at companies in New Jersey. Companies or organizations storing certain hazardous substances in levels above specific threshold amounts are required by state and federal law to file annual reports. The Release and Pollution Prevention Report (RPPR) is used to collect information for the NJDEP Community Right to Know and Pollution Prevention programs. The RPPR gathers data on toxic chemical throughput, multi-media environmental releases, on-site waste management, and off-site transfers, collectively known as material accounting. The Emergency Planning Community Right-to-Know Act (EPCRA) is a federal regulation that “establishes requirements...regarding emergency planning and “Community Right-to-Know” reporting on hazardous toxic chemicals” to increase public knowledge and information about chemical uses.

In 2019, there were 51 sites in Edison Township that met the threshold for the State CRTK. Of those sites, 44 were active, and seven were out of business.

Known Contaminated Sites

The Known Contaminated Sites (KCS) list for New Jersey includes those sites and properties within the state where contamination of soil or groundwater has been confirmed at levels equal to or greater than applicable standards. This may include:

- *Active Sites* with known contamination these sites can have one or more active cases with any number of pending and closes cases.
- *Pending sites* with confirmed contamination, which are those sites having one or more pending cases, no active cases, and any number of closes cases.
- *Closed sites* with remediated contamination, which are those sites having only closed cases. Sites in this category have no active or pending cases.

The KCS list was produced in response to the Brownfield and Contaminated Site Remediation Act (N.J.S.A. 58:10-23.16-17), which required the preparation of a list of sites affected by hazardous substances. It also satisfied obligations under the New Jersey New Residential Construction Off-Site Conditions Disclosure Act (N.J.S.A. 46:3C1 et seq.). Sites included can undergo a wide variety of remedial activities, ranging from relatively simple “cut and scrape” cleanups to highly complex cleanups. The sites with complex contamination issues can have several sources of contamination, which can affect both soil and groundwater at the same time.

The Site Remediation Reform Act, N.J.S.A. 58:10C-1 et seq. (SRRA), enacted in 2009, has helped to speed up the remediation process, “thus helping to decrease the threat of contamination to public health and safety of the environment, and to quickly return underutilized properties to productive use.” Active sites are rated with B, C1, C2, C3, or D, depending on the type of severity of the contamination defined as follows:

- B: Remedial level associated with emergency response, simple removal activities of contaminants usually no impact to soil or groundwater.
- C1: Remedial levels are associated with simple sites one or two contaminates localized to soil and the immediate spill or discharge area.
- C2: Remedial levels are associated with more complicated contaminant discharges such as multiple site spills and discharges, or more than one contaminant, with both soil and groundwater impacted or threatened.
- C3: Remedial levels are associated with highly complex and threatening sites. These sites can have multiple contaminants, some at high concentrations with unknown sources continuing to impact soils, groundwater, and possibly surface waters and potable water resources. These sites are dangerous for direct contact with contaminated soils.
- D: Same conditions are C3 except that D levels are also usually designated Federal “Superfund Sites.”

The Classification Exception Area (CEA) Status explains an area where one or more standards and designated uses are suspended. (N.J.A.C 7:9C -1.4). In Edison, there are 150 total Known Contaminated Sites (non-homeowner). Currently, Edison has 147 active Known Contaminated Sites and three pending. (***Map 16*** and ***Appendix M***)

MAPS

Map 1. Parks and Public Land

Map 2. Bedrock Geology

Map 3. Surficial Geology

Map 4. Topography

Map 5. Soil Types

Map 6. Land Use/Land Cover (2015)

Map 7. Wetlands

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Map 11. Aquifer Recharge Potential

Map 12. Watersheds (HUC 14)

Map 13. Surface Water Quality

Map 14. Public Wellhead Protection Areas

Map 15. FEMA Flood Zones

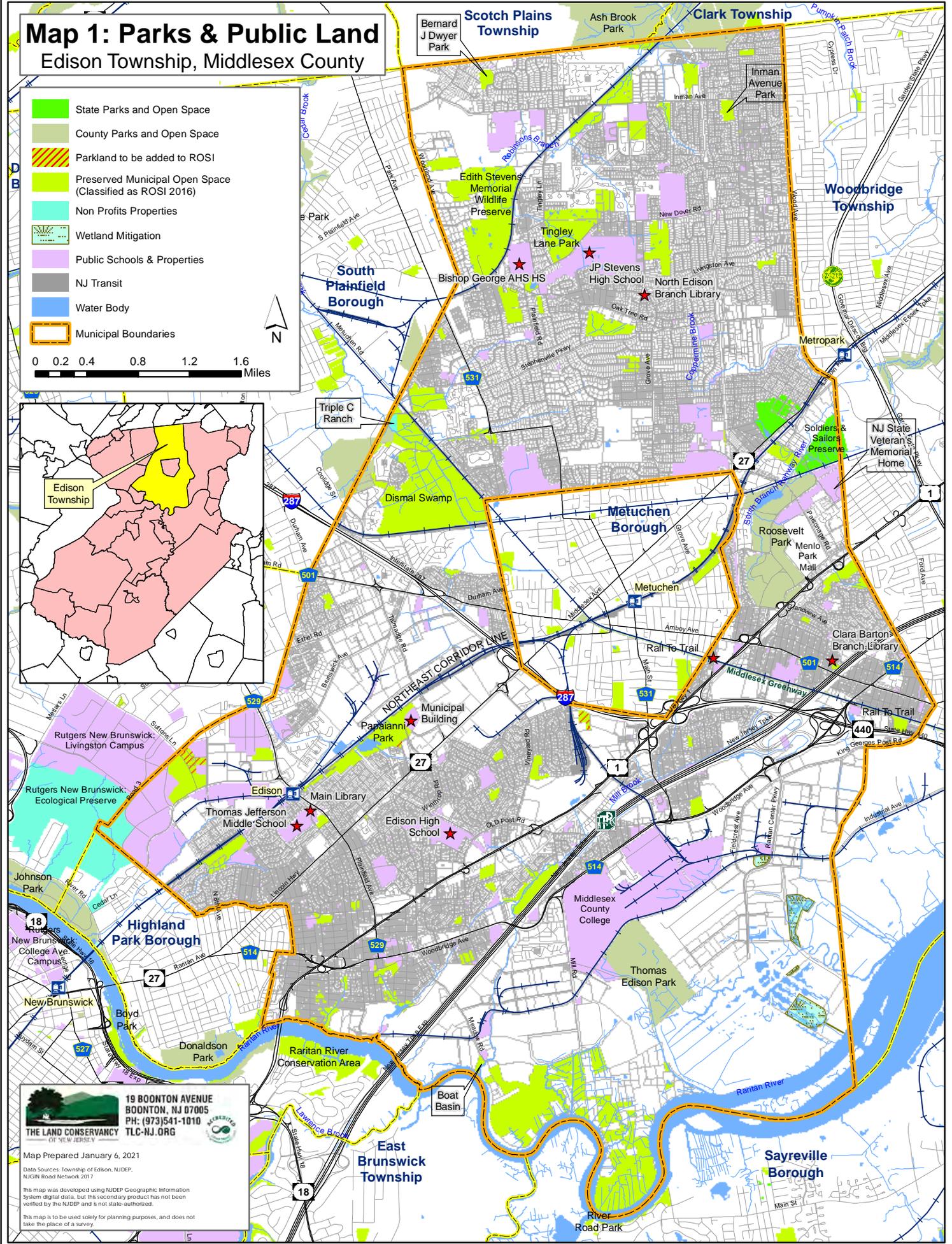
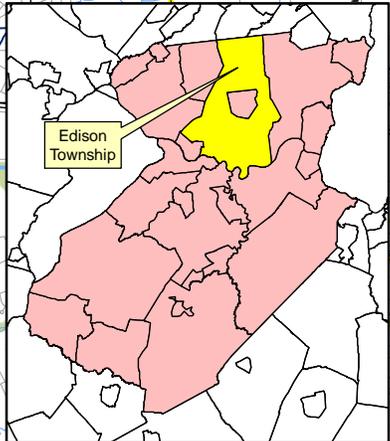
Map 16. Known Contaminated Sites (Non-Homeowner)

Map 1: Parks & Public Land

Edison Township, Middlesex County

- State Parks and Open Space
- County Parks and Open Space
- Parkland to be added to ROSI
- Preserved Municipal Open Space (Classified as ROSI 2016)
- Non Profits Properties
- Wetland Mitigation
- Public Schools & Properties
- NJ Transit
- Water Body
- Municipal Boundaries

0 0.2 0.4 0.8 1.2 1.6 Miles



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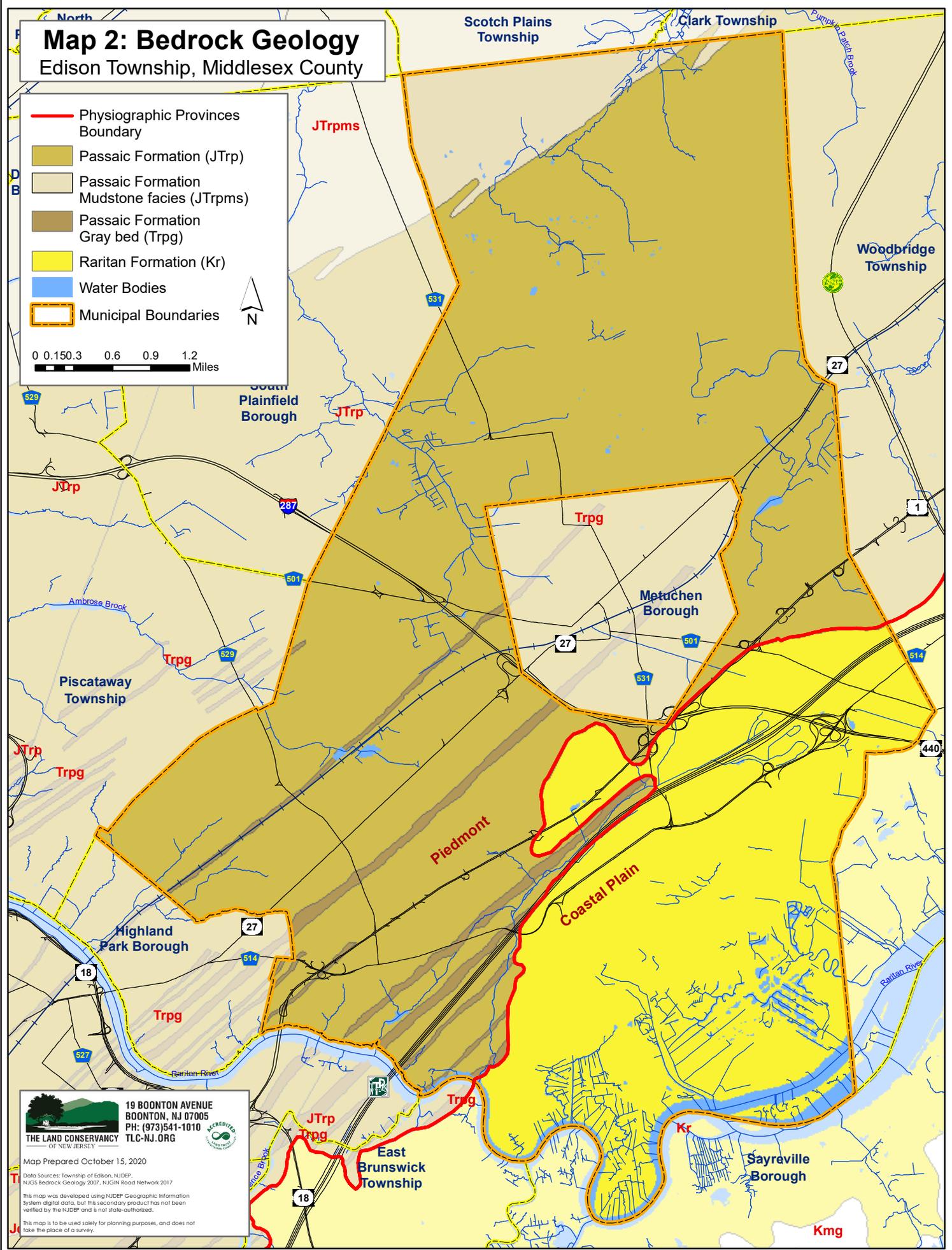
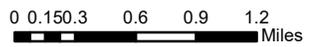
Map Prepared January 6, 2021
Data Sources: Township of Edison, NJDEP, NJGIN Road Network 2017

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Map 2: Bedrock Geology

Edison Township, Middlesex County

-  Physiographic Provinces Boundary
-  Passaic Formation (JTrp)
-  Passaic Formation Mudstone facies (JTrpms)
-  Passaic Formation Gray bed (Trpg)
-  Raritan Formation (Kr)
-  Water Bodies
-  Municipal Boundaries





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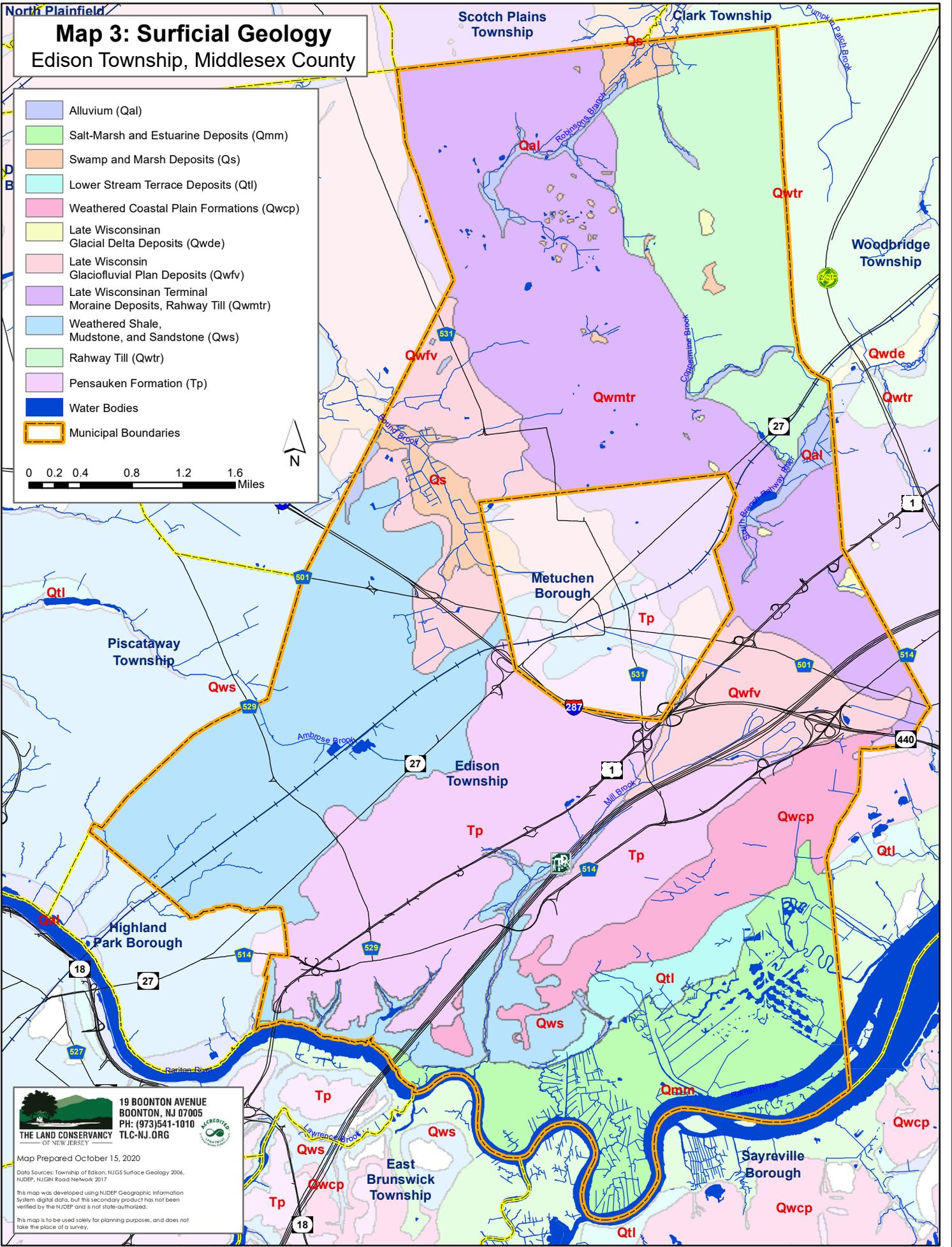


Map Prepared October 15, 2020

Data Sources: Township of Edison, NJDEP, NJGS Bedrock Geology 2007, NJGIN Road Network 2017

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Map 3: Surficial Geology

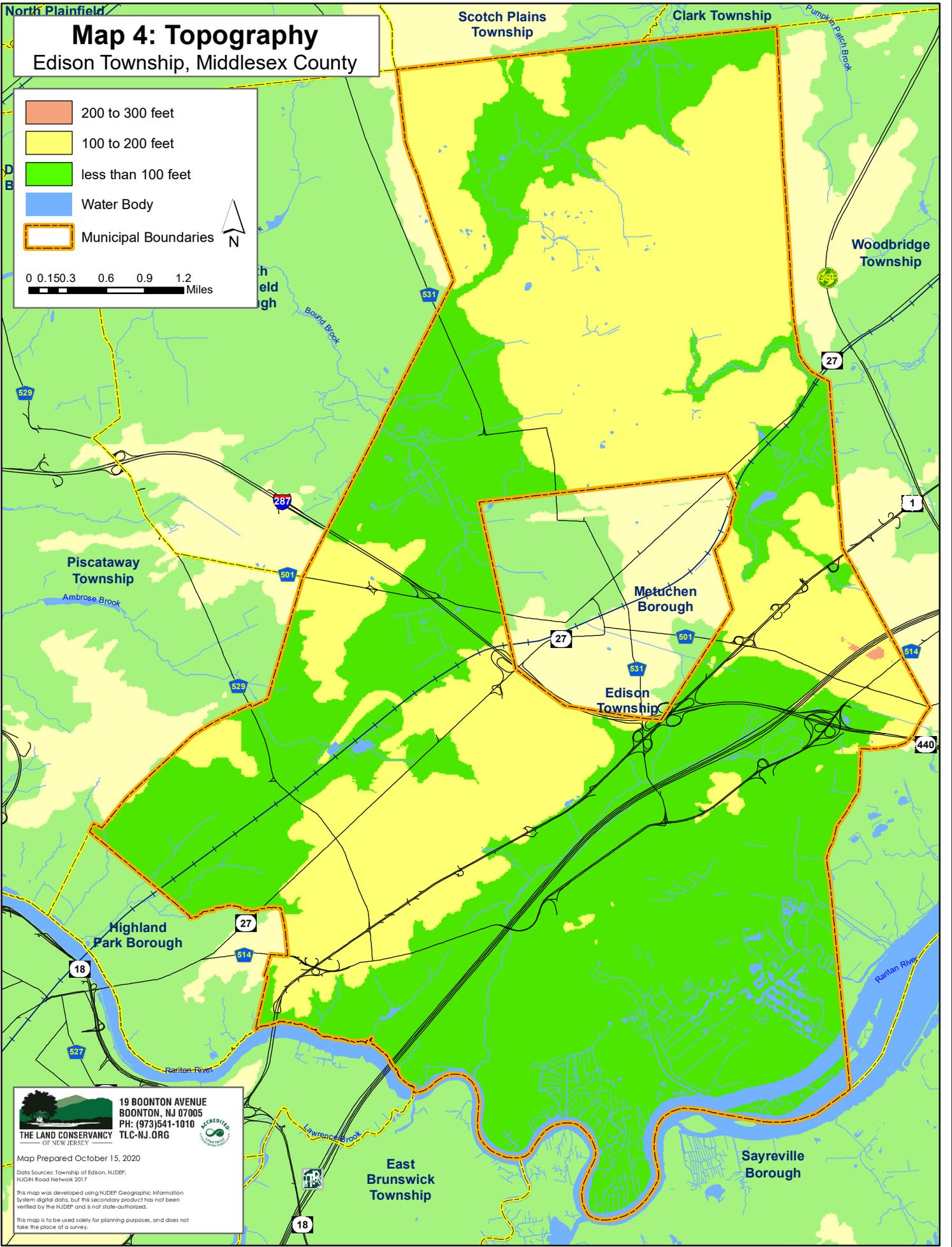
Edison Township, Middlesex County

- Alluvium (Qal)
- Salt-Marsh and Estuarine Deposits (Qmm)
- Swamp and Marsh Deposits (Qs)
- Lower Stream Terrace Deposits (Qtl)
- Weathered Coastal Plain Formations (Qwcp)
- Late Wisconsin Glacial Delta Deposits (Qwde)
- Late Wisconsin Glaciofluvial Plan Deposits (Qwfv)
- Late Wisconsin Terminal Moraine Deposits, Rahway Till (Qwmtr)
- Weathered Shale, Mudstone, and Sandstone (Qws)
- Rahway Till (Qwtr)
- Pensauken Formation (Tp)
- Water Bodies
- Municipal Boundaries




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Map 4: Topography

Edison Township, Middlesex County

	200 to 300 feet
	100 to 200 feet
	less than 100 feet
	Water Body
	Municipal Boundaries

0 0.150.3 0.6 0.9 1.2 Miles

North Arrow

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Plainfield Borough

Scotch Plains Township

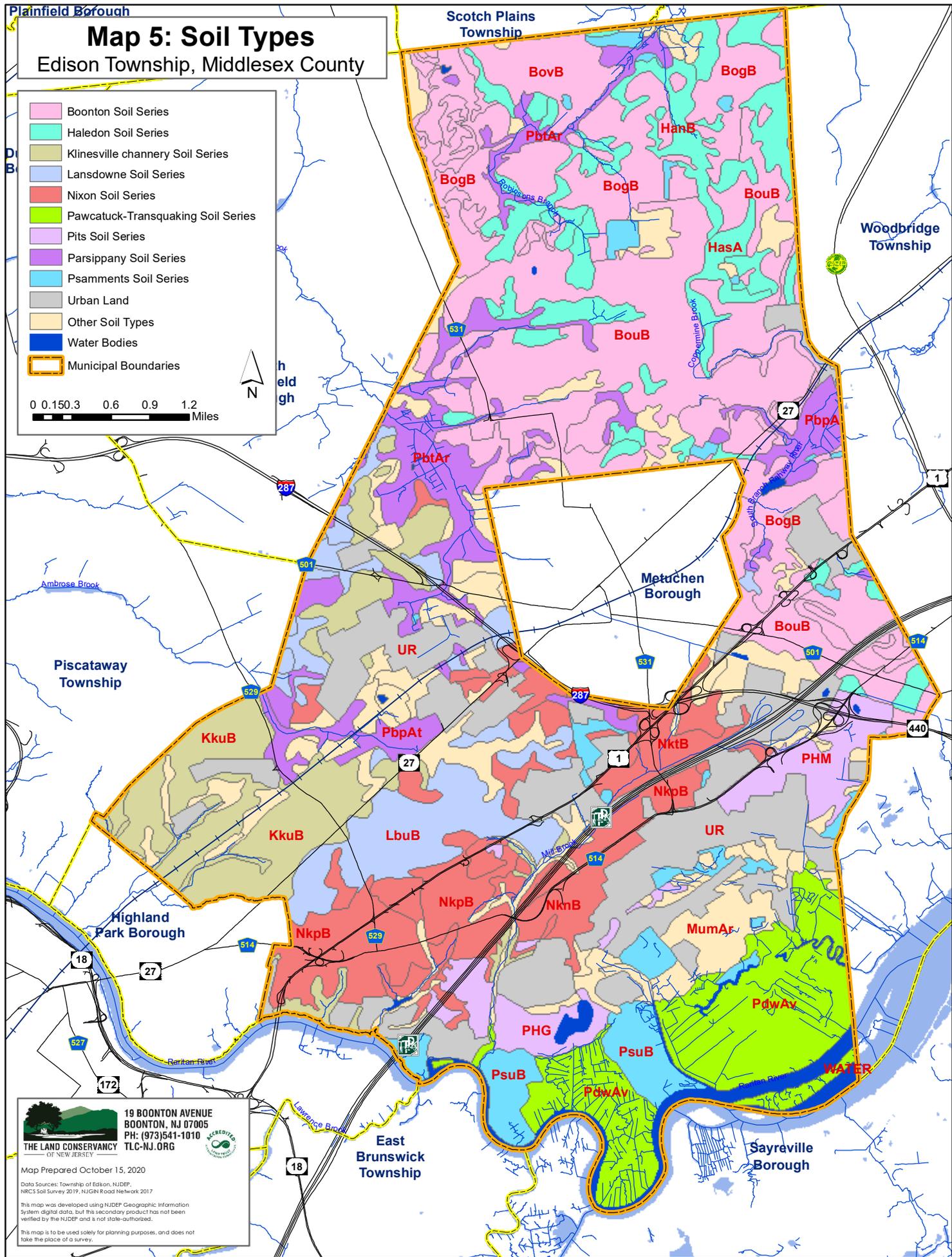
Woodbridge Township

Map 5: Soil Types

Edison Township, Middlesex County

-  Boonton Soil Series
-  Haledon Soil Series
-  Klinesville channery Soil Series
-  Lansdowne Soil Series
-  Nixon Soil Series
-  Pawcatuck-Transquaking Soil Series
-  Pits Soil Series
-  Parsippany Soil Series
-  Psamments Soil Series
-  Urban Land
-  Other Soil Types
-  Water Bodies
-  Municipal Boundaries

0 0.150.3 0.6 0.9 1.2 Miles



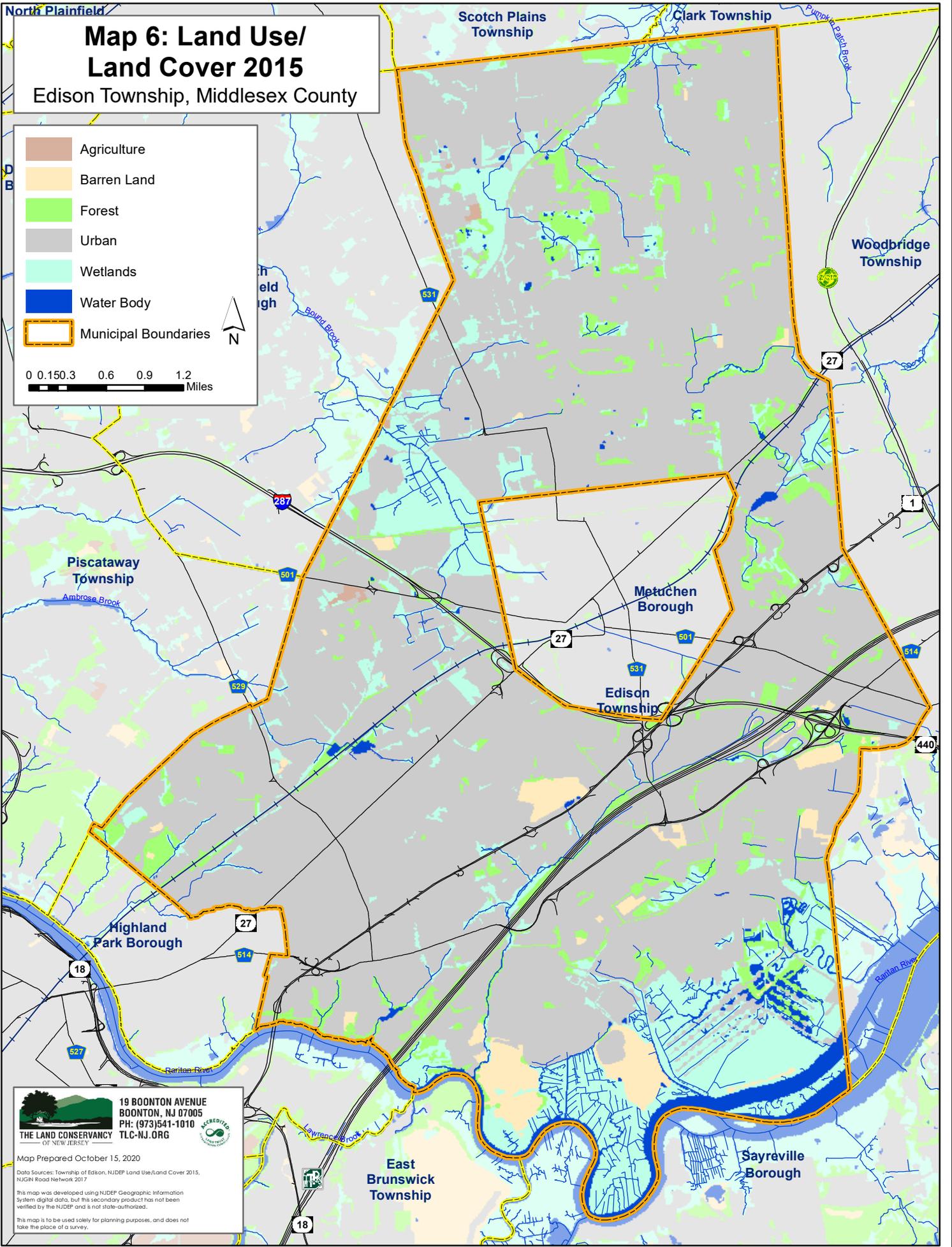
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Map Prepared October 15, 2020

Data Sources: Township of Edison, NJDEP, NRCS Soil Survey 2019, NJGIM Road Network 2017

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Map 6: Land Use/ Land Cover 2015

Edison Township, Middlesex County

- Agriculture
- Barren Land
- Forest
- Urban
- Wetlands
- Water Body
- Municipal Boundaries



0 0.150.3 0.6 0.9 1.2
Miles



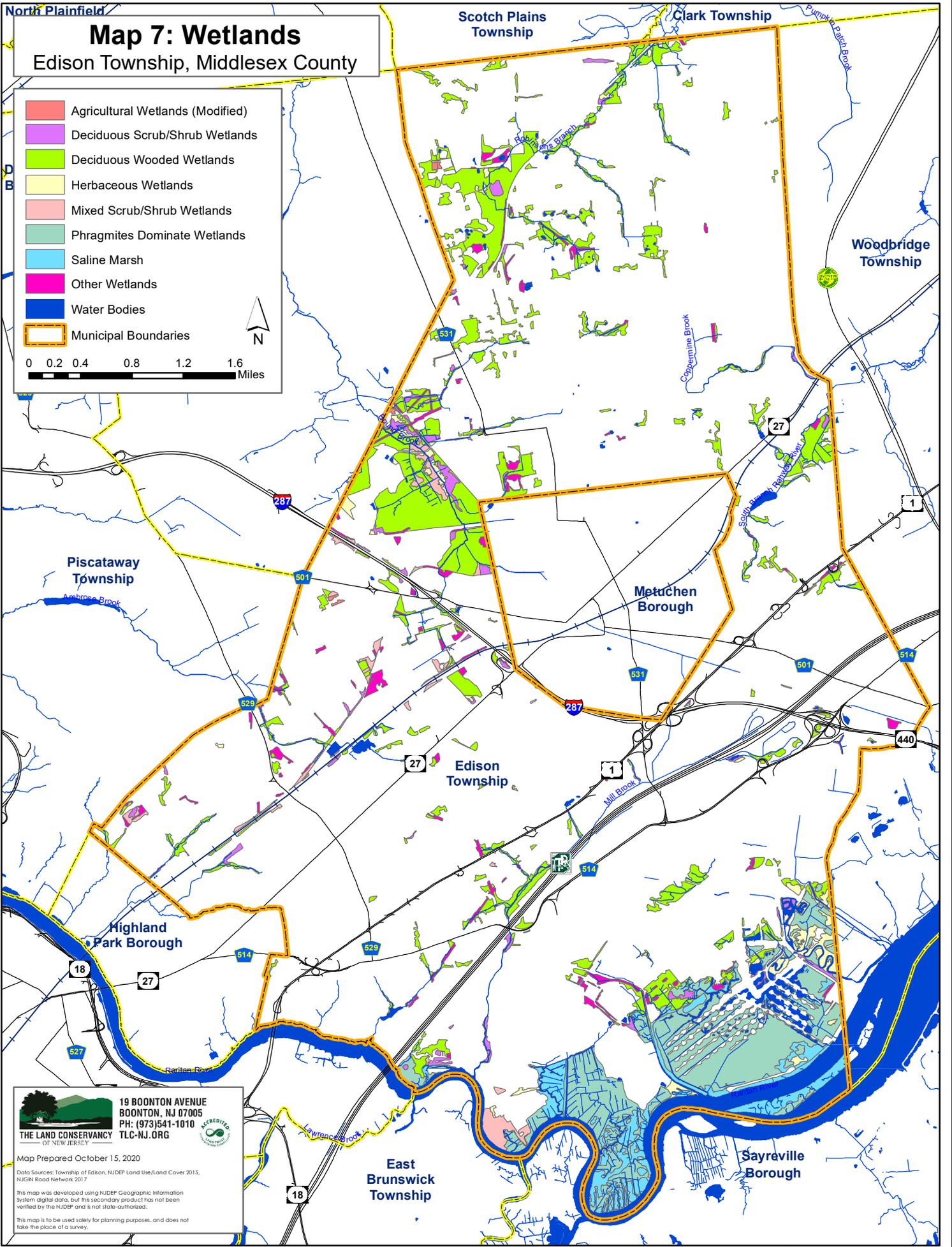
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Map Prepared October 15, 2020

Data Sources: Township of Edison, NJDEP Land Use/Land Cover 2015, NJGIN Road Network 2017

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Map 7: Wetlands

Edison Township, Middlesex County

- Agricultural Wetlands (Modified)
- Deciduous Scrub/Shrub Wetlands
- Deciduous Wooded Wetlands
- Herbaceous Wetlands
- Mixed Scrub/Shrub Wetlands
- Phragmites Dominate Wetlands
- Saline Marsh
- Other Wetlands
- Water Bodies
- Municipal Boundaries

N

0 0.2 0.4 0.8 1.2 1.6 Miles

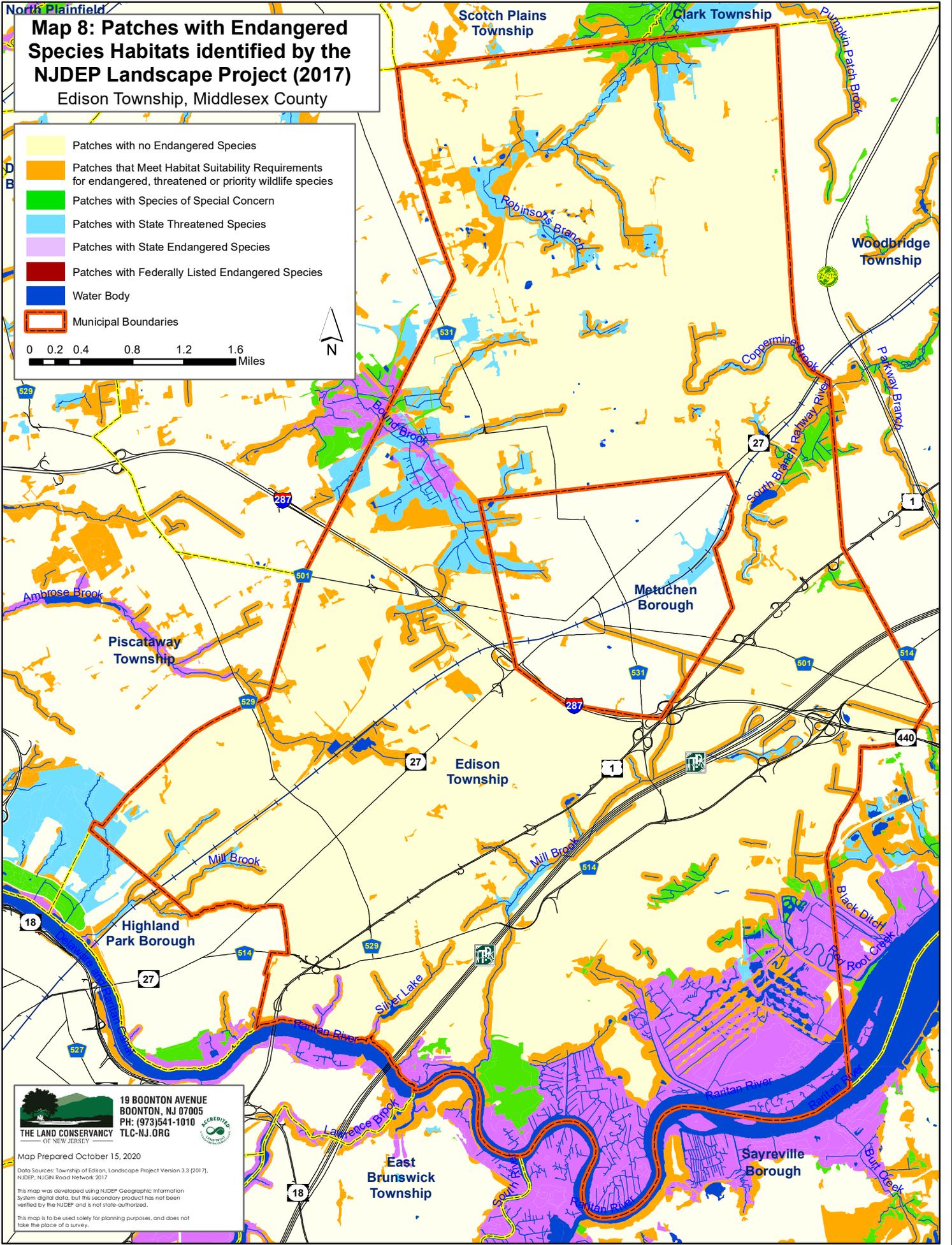
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Map Prepared October 15, 2020

Data Sources: Township of Edison, NJDEP Land Use/Land Cover 2015, NJGIN Road Network 2017

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Map 8: Patches with Endangered Species Habitats identified by the NJDEP Landscape Project (2017)
Edison Township, Middlesex County

	Patches with no Endangered Species
	Patches that Meet Habitat Suitability Requirements for endangered, threatened or priority wildlife species
	Patches with Species of Special Concern
	Patches with State Threatened Species
	Patches with State Endangered Species
	Patches with Federally Listed Endangered Species
	Water Body
	Municipal Boundaries

0 0.2 0.4 0.8 1.2 1.6 Miles

N

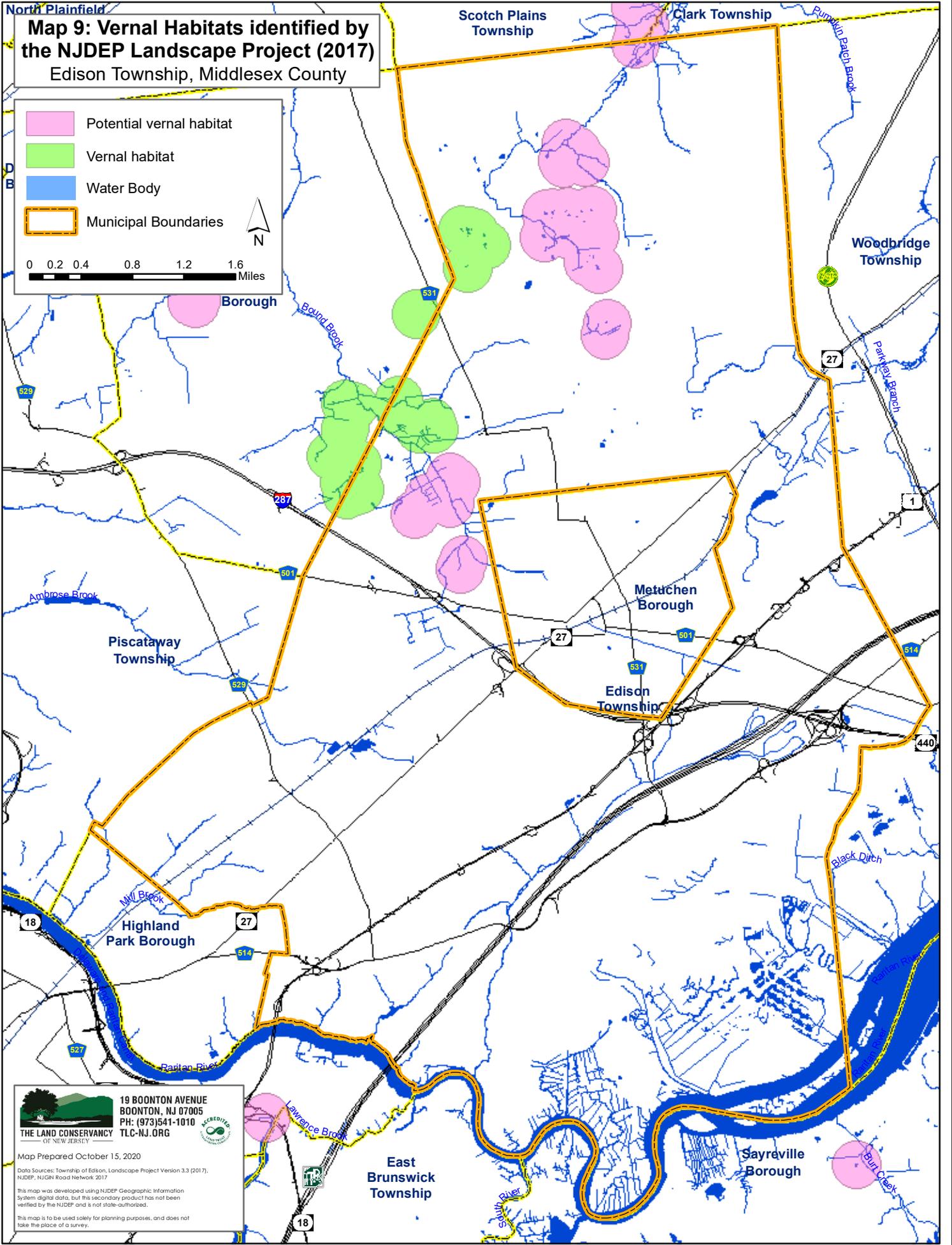
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Map Prepared October 15, 2020

Data Sources: Township of Edison, Landscape Project Version 3.3 (2017), NJDEP, NJGIN Road Network 2017

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

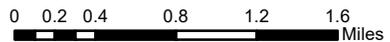
This map is to be used solely for planning purposes, and does not take the place of a survey.



Map 9: Vernal Habitats identified by the NJDEP Landscape Project (2017)
Edison Township, Middlesex County

Potential vernal habitat
 Vernal habitat
 Water Body
 Municipal Boundaries


 N

0 0.2 0.4 0.8 1.2 1.6 Miles



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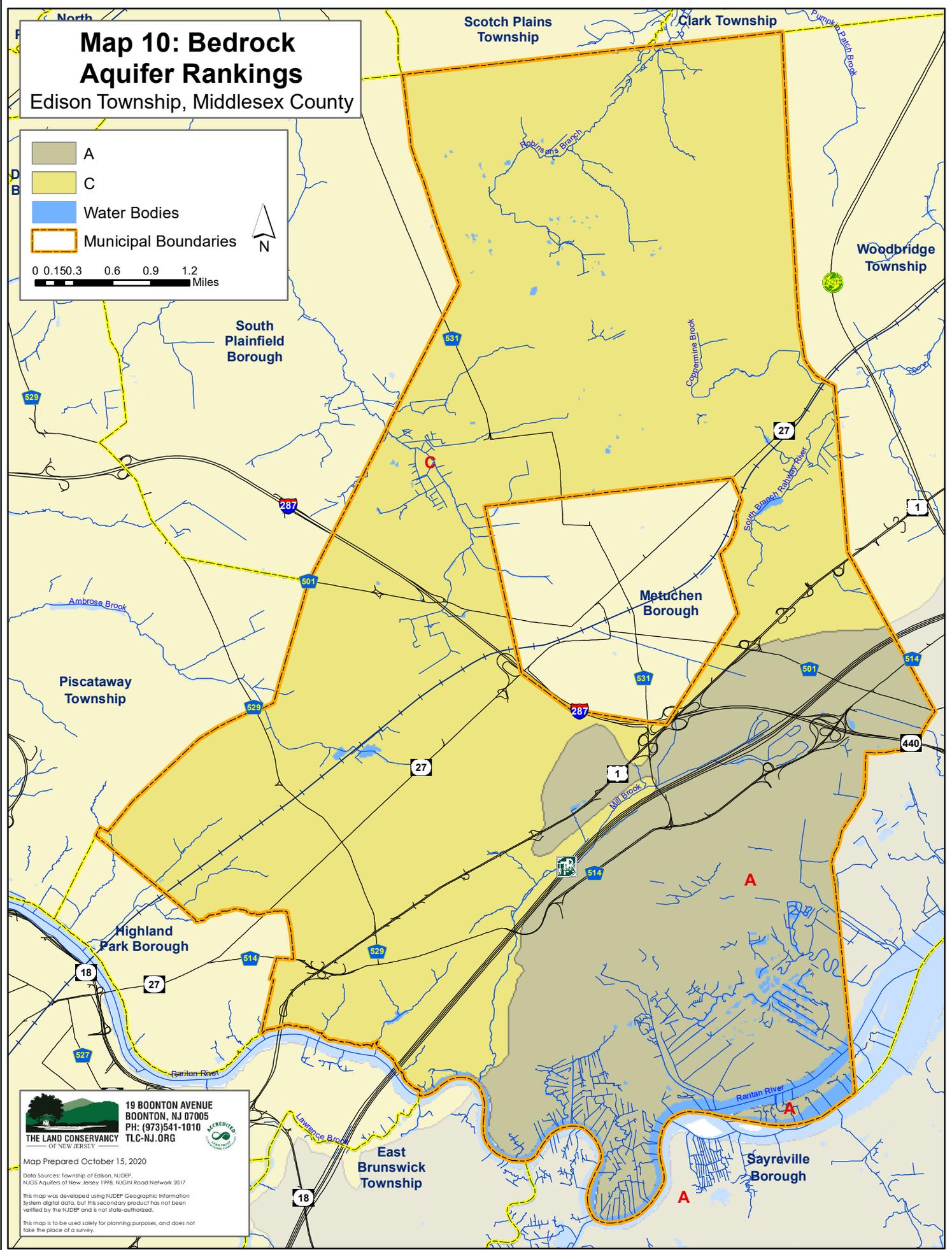

 Map Prepared October 15, 2020
 Data Sources: Township of Edison, Landscape Project Version 3.3 (2017), NJDEP, NJGIN Road Network 2017
 This map was developed using NJDEP Geographic Information System digital data, but this secondary product has not been verified by the NJDEP and is not state-authorized.
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Map 10: Bedrock Aquifer Rankings

Edison Township, Middlesex County

A
 C
 Water Bodies
 Municipal Boundaries

0 0.150.3 0.6 0.9 1.2 Miles


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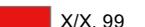
Map Prepared October 15, 2020

Data Sources: Township of Edison, NJDEP, NJGS Aquifers of New Jersey 1998, NJGIN Road Network 2017
This map was developed using NJDEP Geographic Information System digital data, but this secondary product has not been verified by the NJDEP and is not state-authorized.
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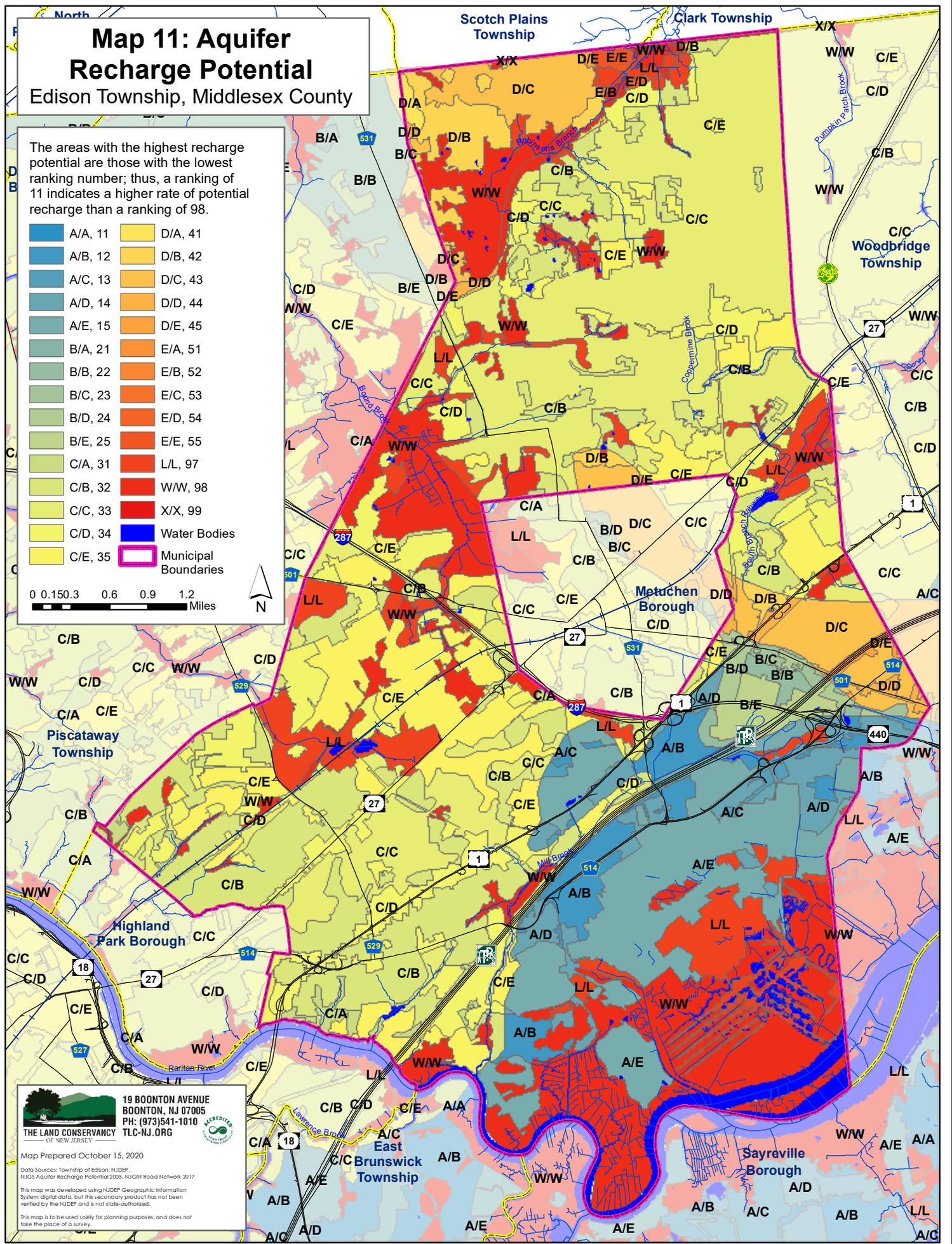
Map 11: Aquifer Recharge Potential

Edison Township, Middlesex County

The areas with the highest recharge potential are those with the lowest ranking number; thus, a ranking of 11 indicates a higher rate of potential recharge than a ranking of 98.

- | | |
|---|--|
|  A/A, 11 |  D/A, 41 |
|  A/B, 12 |  D/B, 42 |
|  A/C, 13 |  D/C, 43 |
|  A/D, 14 |  D/D, 44 |
|  A/E, 15 |  D/E, 45 |
|  B/A, 21 |  E/A, 51 |
|  B/B, 22 |  E/B, 52 |
|  B/C, 23 |  E/C, 53 |
|  B/D, 24 |  E/D, 54 |
|  B/E, 25 |  E/E, 55 |
|  C/A, 31 |  L/L, 97 |
|  C/B, 32 |  W/W, 98 |
|  C/C, 33 |  X/X, 99 |
|  C/D, 34 |  Water Bodies |
|  C/E, 35 |  Municipal Boundaries |

0 0.150.3 0.6 0.9 1.2 Miles



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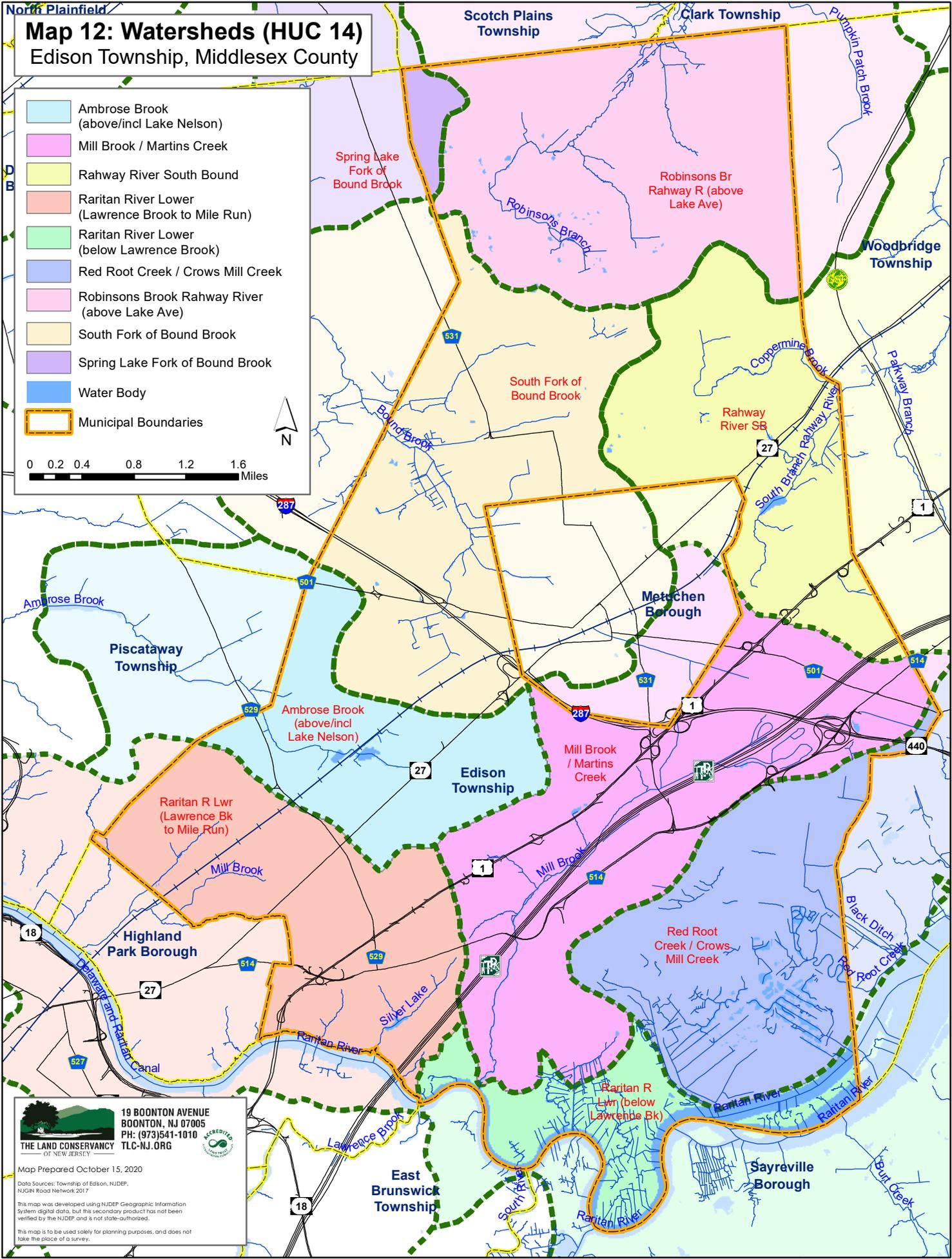
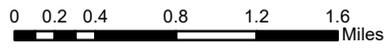
Data Sources: Township of Edison, NJDEP, NJGS Aquifer Recharge Potential 2005, NJGIN Road Network 2017

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

This map is to be used solely for planning purposes, and does not take the place of a survey.

Map 12: Watersheds (HUC 14) Edison Township, Middlesex County

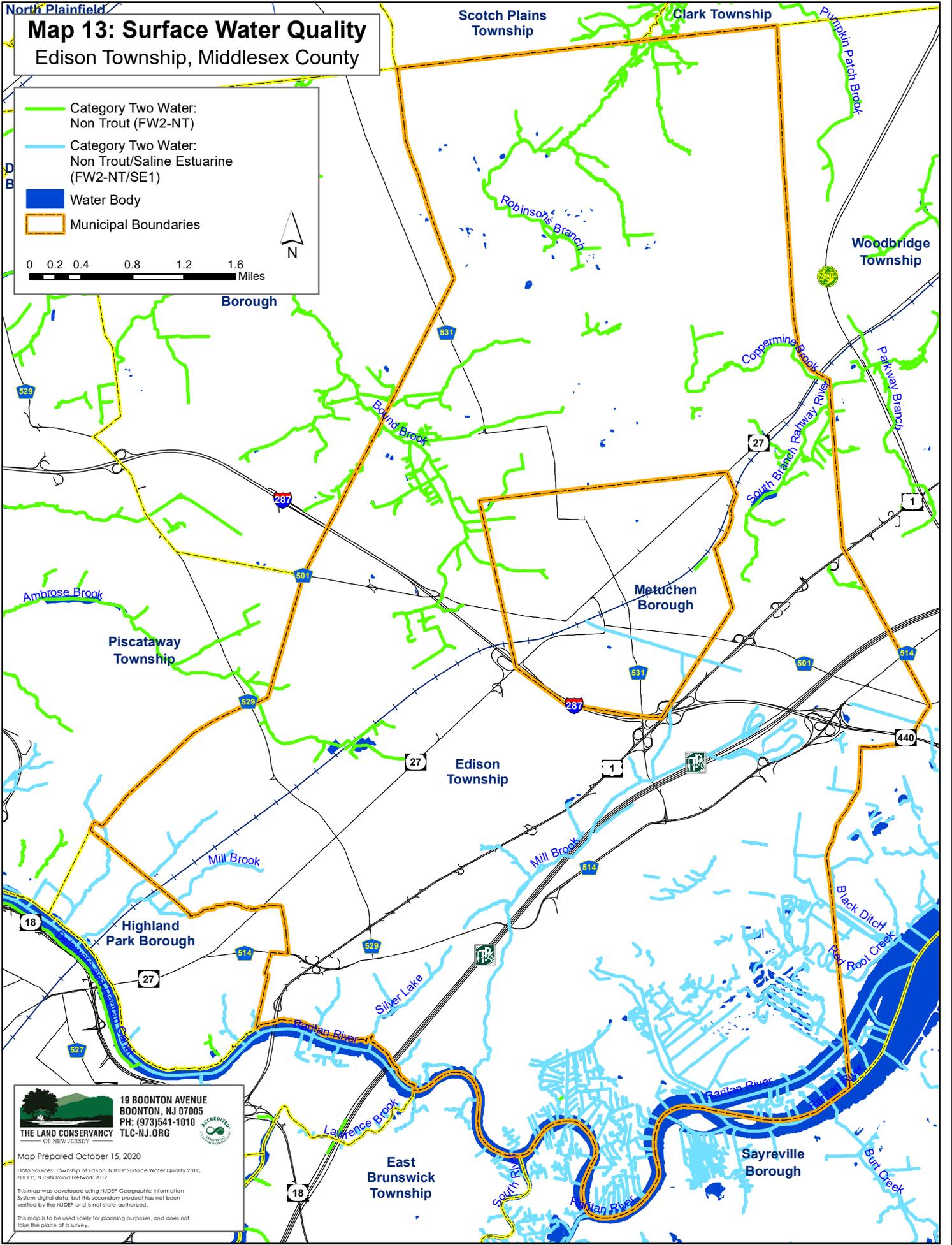
- Ambrose Brook (above/incl Lake Nelson)
- Mill Brook / Martins Creek
- Rahway River South Bound
- Raritan River Lower (Lawrence Brook to Mile Run)
- Raritan River Lower (below Lawrence Brook)
- Red Root Creek / Crows Mill Creek
- Robinsons Brook Rahway River (above Lake Ave)
- South Fork of Bound Brook
- Spring Lake Fork of Bound Brook
- Water Body
- Municipal Boundaries



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Map 13: Surface Water Quality

Edison Township, Middlesex County

- Category Two Water: Non Trout (FW2-NT)
- Category Two Water: Non Trout/Saline Estuarine (FW2-NT/SE1)
- Water Body
- Municipal Boundaries

N

0 0.2 0.4 0.8 1.2 1.6 Miles

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Data Sources: Township of Edison, NJDEP Surface Water Quality 2010, NJDEP, NJGIN Road Network 2017

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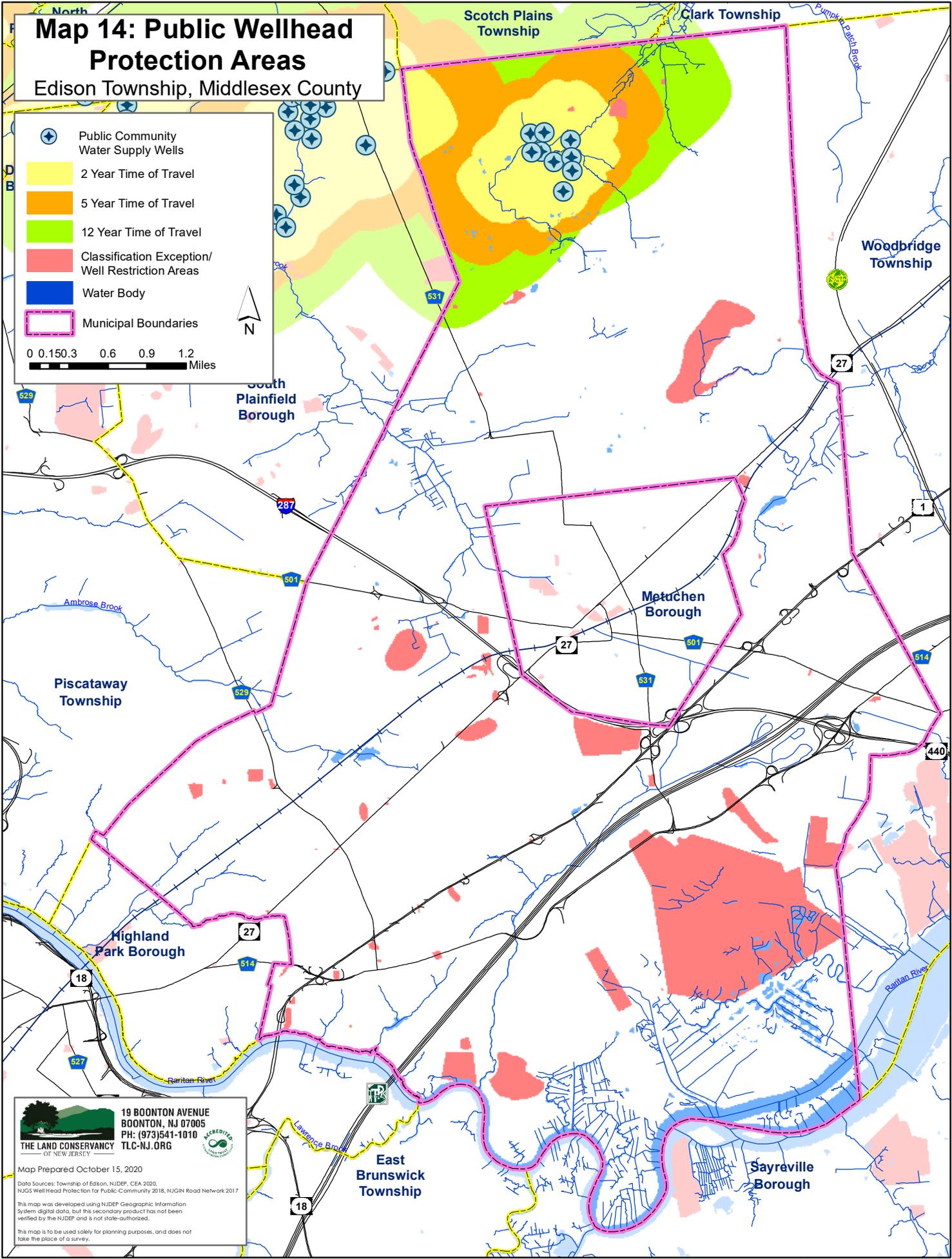
This map is to be used solely for planning purposes, and does not take the place of a survey.

Map 14: Public Wellhead Protection Areas

Edison Township, Middlesex County

-  Public Community Water Supply Wells
-  2 Year Time of Travel
-  5 Year Time of Travel
-  12 Year Time of Travel
-  Classification Exception/ Well Restriction Areas
-  Water Body
-  Municipal Boundaries

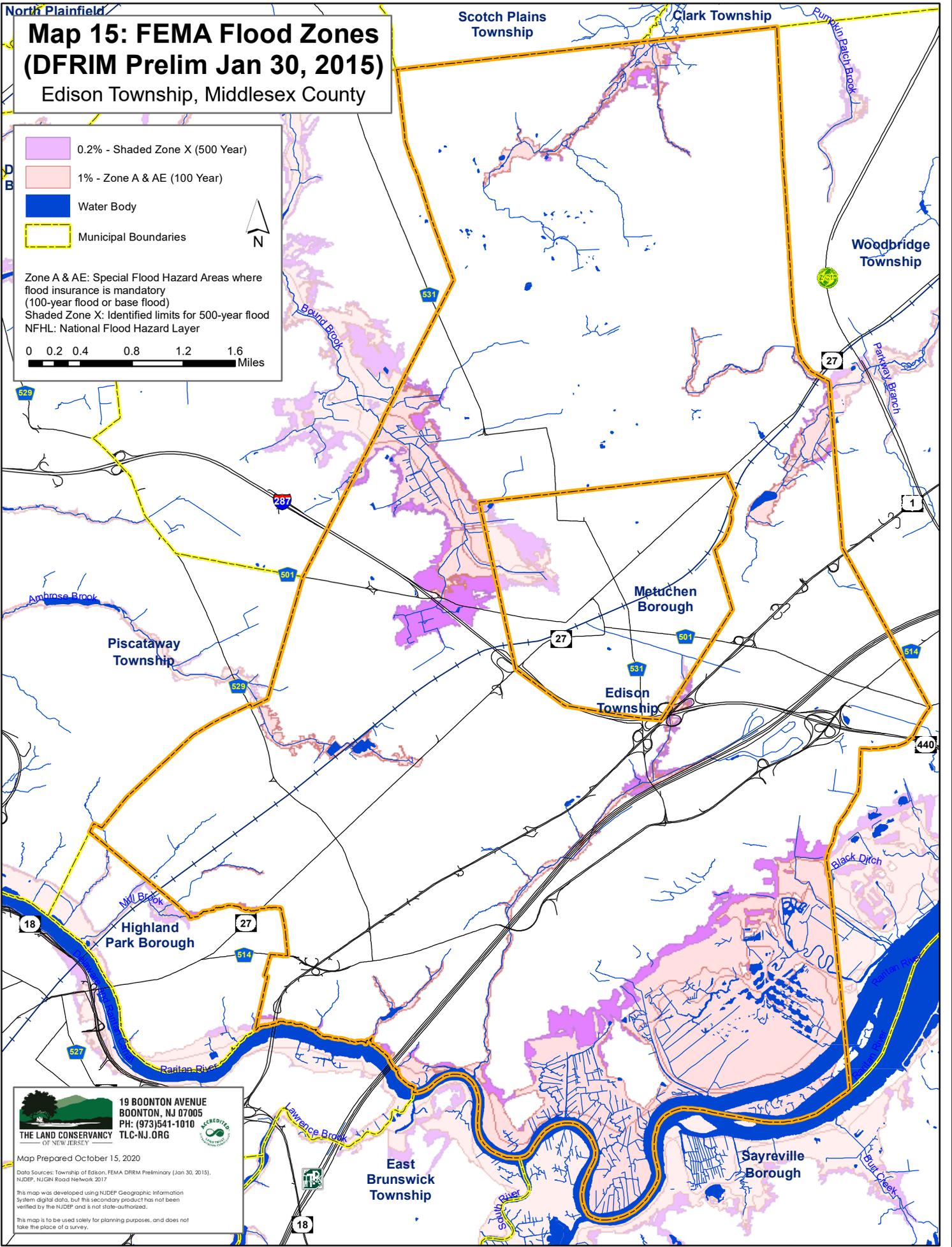
0 0.150.3 0.6 0.9 1.2 Miles



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Map Prepared October 15, 2020
 Data Sources: Township of Edison, NJDEP, CEA 2020
 NJGS Wellhead Protection for Public-Community 2018, NJGIN Road Network 2017

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Map 15: FEMA Flood Zones (DFRIM Prelim Jan 30, 2015) Edison Township, Middlesex County

0.2% - Shaded Zone X (500 Year)
 1% - Zone A & AE (100 Year)
 Water Body
 Municipal Boundaries

Zone A & AE: Special Flood Hazard Areas where flood insurance is mandatory (100-year flood or base flood)
 Shaded Zone X: Identified limits for 500-year flood
 NFHL: National Flood Hazard Layer

0 0.2 0.4 0.8 1.2 1.6 Miles


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Map Prepared October 15, 2020
 Data Sources: Township of Edison, FEMA DFRIM Preliminary (Jan 30, 2015), NJDEP, NJGIS Road Network 2017

This map was developed using NJDEP Geographic Information System digital data, but this secondary product has not been verified by the NJDEP and is not state-authorized.
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Map 16: Known Contaminated Sites (Non-Homeowner)

Edison Township, Middlesex County

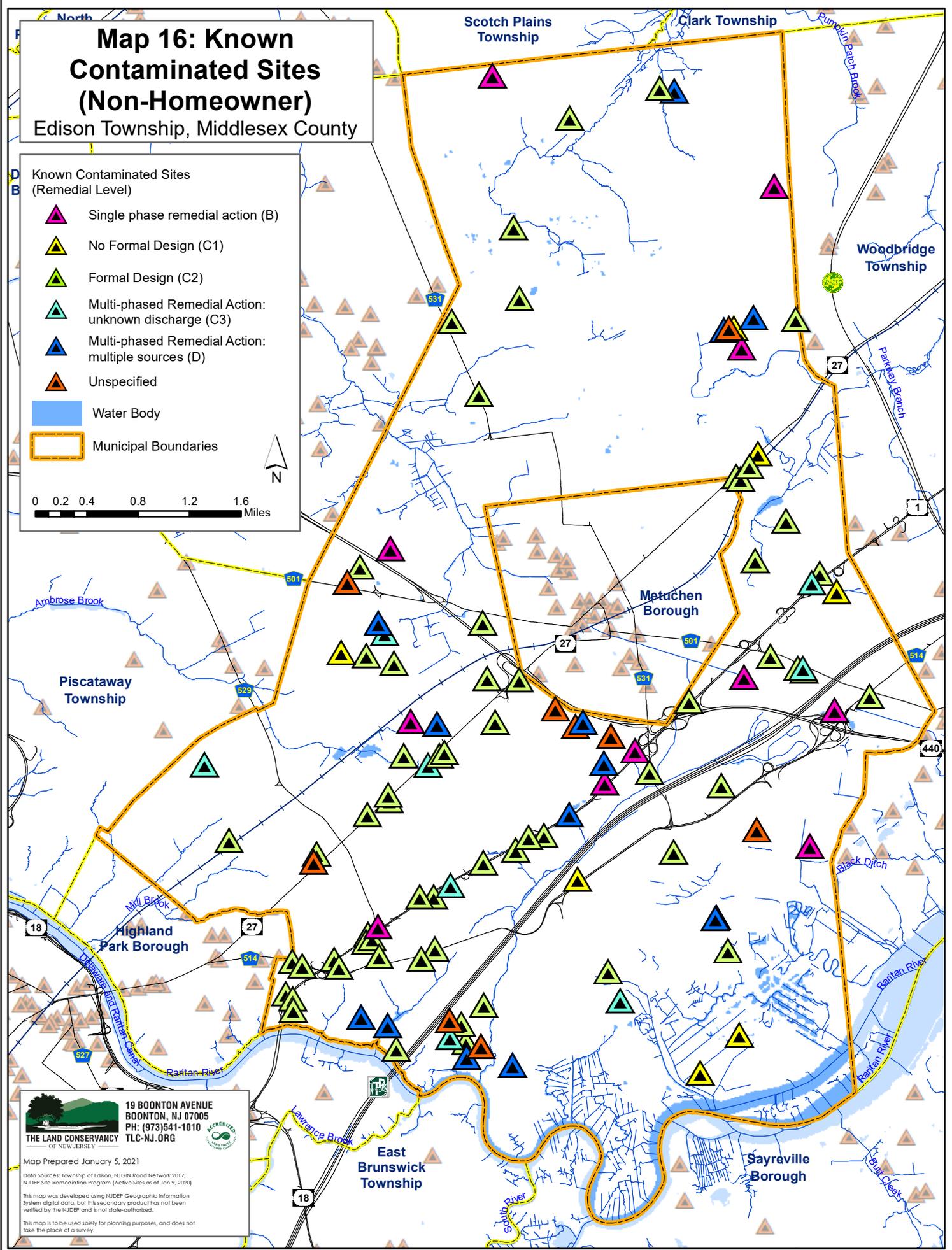
Known Contaminated Sites (Remedial Level)

-  Single phase remedial action (B)
-  No Formal Design (C1)
-  Formal Design (C2)
-  Multi-phased Remedial Action: unknown discharge (C3)
-  Multi-phased Remedial Action: multiple sources (D)
-  Unspecified

 Water Body

 Municipal Boundaries

0 0.2 0.4 0.8 1.2 1.6 Miles



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Map Prepared January 5, 2021

Data Sources: Township of Edison, NJGIN Road Network 2017, NJDEP Site Remediation Program (Active Sites as of Jan 9, 2020)

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

This map is to be used solely for planning purposes, and does not take the place of a survey.

APPENDICES

Appendix A. Soil Series in Edison Township

Appendix B. Major Soil Series in Edison

Appendix C. Hydric Soil Ratings in Edison Township

Appendix D. Soil Ratings for Agricultural Use in Edison Township

Appendix E. Soil K Factors in Edison Township

Appendix F. Erosion Hazard (Road/Trail) in Edison Township

Appendix G. Soil Limitations in Edison Township

Appendix H. Soil Limitations for Building Site Development

Appendix I. Values and Limitations of Soils in Edison for Recreational Use

Appendix J. Rare Plant Species and Ecological Communities in Middlesex County

Appendix K. State Threatened and Species of Special Concern in Edison Township

Appendix L. Classification Exception / Wellhead Restriction Areas

Appendix M. Known Contaminated Sites in Edison Township

Appendix A. Soil Series in Edison Township				
Abbrv.	Soil	Type	Acres	% of Township
AtsA	Atsion sand, 0 to 2 percent slopes, Northern Coastal Plain	<i>Cn</i>	145.3	0.7%
BogB	Boonton loam, 3 to 8 percent slopes	<i>Cn</i>	1,745.6	8.9%
BogC	Boonton loam, 8 to 15 percent slopes	<i>Cn</i>	256.5	1.3%
BohC	Boonton moderately well drained gravelly loam, 8 to 15 percent slopes	<i>Cn</i>	3.6	0.0%
BouB	Boonton-Urban land complex, 0 to 8 percent slopes	<i>Cx</i>	2,597.8	13.2%
BouD	Boonton-Urban land complex, 15 to 25 percent slopes	<i>Cx</i>	4.7	0.0%
BovB	Boonton-Urban land-Haledon complex 0 to 8 percent slopes	<i>Cx</i>	311.2	1.6%
CarbAt	Carlisle-Adrian mucks, 0 to 2 percent slopes, frequently flooded	<i>Cx</i>	7.4	0.0%
DuuA	Dunellen Urban land complex, 0 to 3 percent slopes	<i>Cx</i>	150.9	0.8%
DuxA	Dunellen moderately well drained variant sandy loam, 0 to 2 percent slopes	<i>Cn</i>	223.4	1.1%
DuxB	Dunellen moderately well drained variant sandy loam, 2 to 6 percent complex, 0 to 6 percent slopes	<i>Cn</i>	21.3	0.1%
DuyB	Dunellen moderately well drained variant-Urban land complex, 0 to 6 percent slopes	<i>Cx</i>	89.8	0.5%
EkaAr	Elkton loam, 0 to 2 percent slopes, rarely flooded	<i>Cn</i>	25.6	0.1%
FapA	Fallsington loams substratum variant loam, 0 to 2 percent slopes, Northern Coastal Plain	<i>Cx</i>	16.9	0.1%
FavAr	Fallsington bedrock substratum variant loam, 0 to 2 percent slopes, rarely flooded	<i>Cn</i>	16.8	0.1%
GamB	Galloway loamy sand, 0 to 5 percent slopes	<i>Cn</i>	39.2	0.2%
HakA	Haledon loam, 0 to 3 percent slopes	<i>Cn</i>	56.6	0.3%
HanA	Haledon silt loam, 0 to 3 percent slopes	<i>Cn</i>	384.7	2.0%
HanB	Haledon silt loam, 3 to 8 percent slopes	<i>Cn</i>	429.0	2.2%
HasA	Haledon-Urban land complex, 0 to 3 percent slopes	<i>Cx</i>	373.7	1.9%
HatB	Haledon-Urban land-Hasbrouck complex, 0 to 8 percent slopes	<i>Cx</i>	50.7	0.3%
HctA	Hasbrouck silt loam, 0 to 3 percent slopes	<i>Cn</i>	131.3	0.7%
HctAr	Hasbrouck silt loam, 0 to 3 percent slopes, rarely flooded	<i>Cn</i>	29.7	0.2%
KemD	Keyport sandy loam, 10 to 15 percent slopes	<i>Cn</i>	1.5	0.0%
KeoA	Keyport loam, 0 to 2 percent slopes	<i>Cn</i>	2.5	0.0%
KeoB	Keyport loam, 2 to 5 percent slopes	<i>Cn</i>	8.4	0.0%
KkoB	Klinesville channery loam, 2 to 6 percent slopes	<i>Cn</i>	331.6	1.7%

Appendix A. Soil Series in Edison Township

Abbrv.	Soil	Type	Acres	% of Township
KkoC	Klinesville channery loam, 6 to 12 percent slopes	<i>Cn</i>	25.2	0.1%
KkoE	Klinesville channery loam, 18 to 35 percent slopes	<i>Cn</i>	118.6	0.6%
KkuB	Klinesville-Urban land complex, 0 to 6 percent slopes	<i>Cx</i>	992.8	5.1%
LakB	Lakehurst sand, 0 to 5 percent slopes	<i>Cn</i>	13.6	0.1%
LbtA	Lansdowne silt loam, 0 to 2 percent slopes	<i>Cn</i>	23.2	0.1%
LbtB	Lansdowne silt loam, 2 to 6 percent slopes	<i>Cn</i>	88.2	0.4%
LbuB	Lansdowne-Urban land complex, 0 to 6 percent slopes	<i>Cx</i>	795.4	4.1%
LbxA6	Lansdowne moderately deep variant silt loam, 0 to 2 percent slopes	<i>Cn</i>	89.1	0.5%
MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	<i>Cn</i>	94.5	0.5%
MumAr	Mullica sandy loam, 0 to 2 percent slopes, rarely flooded	<i>Cn</i>	208.1	1.1%
NknA	Nixon loam, 0 to 2 percent slopes	<i>Cn</i>	71.9	0.4%
NknB	Nixon loam, 2 to 5 percent slopes	<i>Cn</i>	282.0	1.4%
NkpB	Nixon-Urban land complex, 0 to 5 percent slopes	<i>Cx</i>	888.6	4.5%
NkrA	Nixon moderately well drained variant loam, 0 to 2 percent slopes	<i>Cn</i>	227.6	1.2%
NkrB	Nixon moderately well drained variant loam, 2 to 5 percent slopes	<i>Cn</i>	20.9	0.1%
NktB	Nixon moderately well drained variant-Urban land complex, 0 to 5 percent slopes	<i>Cx</i>	495.5	2.5%
PbpA	Parsippany silt loam, 0 to 3 percent slopes	<i>Cn</i>	344.6	1.8%
PbpAt	Parsippany silt loam, 0 to 3 percent slopes, frequently flooded	<i>Cn</i>	190.5	1.0%
PbtAr	Parsippany very poorly drained variant silt loam, 0 to 3 percent slopes, rarely flooded	<i>Cn</i>	851.0	4.3%
PdwAv	Pawcatuck-Transquaking complex, 0 to 2 percent slopes, very frequently flooded	<i>Cx</i>	1,424.0	7.3%
PHG	Pits, sand and gravel	<i>Cn</i>	313.6	1.6%
PHM	Pits, clay	<i>Cn</i>	326.9	1.7%
PssA	Psamments, 0 to 3 percent slopes	<i>Cn</i>	275.0	1.4%
PstA	Psamments sulfidic substratum, 0 to 3 percent slopes	<i>Cn</i>	67.1	0.3%
PsuB	Psamments waste substratum, 0 to 8 percent slopes	<i>Cn</i>	390.9	2.0%
RehA	Reaville silt loam, 0 to 2 percent slopes	<i>Cn</i>	114.8	0.6%
RehB	Reaville silt loam, 2 to 6 percent slopes	<i>Cn</i>	24.5	0.1%
RemB	Reaville-Urban land complex, 0 to 6 percent slopes	<i>Cx</i>	31.3	0.2%
RorAt	Rowland silt loam, 0 to 2 percent slopes, frequently flooded	<i>Cn</i>	71.1	0.4%

Appendix A. Soil Series in Edison Township				
Abbrv.	Soil	Type	Acres	% of Township
SadC	Sassafras gravelly sandy loam, 5 to 10 percent slopes	<i>Cn</i>	60.6	0.3%
SadD	Sassafras gravelly sandy loam, 10 to 15 percent slopes	<i>Cn</i>	5.4	0.0%
SafB	Sassafras loam, 2 to 5 percent slopes	<i>Cn</i>	3.2	0.0%
UdbB	Udorthents, bedrock substratum, 0 to 8 percent slopes	<i>Cn</i>	95.5	0.5%
UdcB	Udorthents, clayey substratum, 0 to 8 percent slopes	<i>Cn</i>	56.0	0.3%
UdrB	Udorthents, refuse substratum, 0 to 8 percent slopes	<i>Cn</i>	4.3	0.0%
UdwuB	Udorthents, wet substratum-Urban land complex, 0 to 8 percent slopes	<i>Cx</i>	250.7	1.3%
UR	Urban land	<i>Cn</i>	2,426.0	12.4%
WATER	Water	<i>Cn</i>	375.0	1.9%
WoeA	Woodstown sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	<i>Cn</i>	4.4	0.0%
Subtotals for Soil Survey Area:			19,597.5	100%
<i>Source: NRCS Web Soil Survey, Accessed February 2020</i>				

Appendix B. Major Soil Series in Edison					
Abbrv.	Map Unit Name	Type	Arability Potential	Acres	% of Township
<i>Boonton Series</i>					
BogB	Boonton loam, 3 to 8 percent slopes	Cn	Prime farmland	1,745.6	8.9%
BogC	Boonton loam, 8 to 15 percent slopes	Cn	Statewide importance	256.5	1.3%
BohC	Boonton moderately well drained gravelly loam, 8 to 15 % slopes	Cn	Statewide importance	3.6	0.0%
BouB	Boonton-Urban land complex, 0 to 8 % slopes	Cx	Not prime farmland	2,597.8	13.2%
BovB	Boonton-Urban land-Haledon complex, 0 to 8 % slopes	Cx	Not prime farmland	311.2	1.6%
Total				4,914.7	25.0%
<i>Nixon Series</i>					
NknA	Nixon loam, 0 to 2 percent slopes	Cn	Prime farmland	71.9	0.4%
NknB	Nixon loam, 2 to 5 percent slopes	Cn	Prime farmland	282.0	1.4%
NkpB	Nixon-Urban land complex, 0 to 5 percent slopes	Cx	Not prime farmland	888.6	4.5%
NkrA	Nixon moderately well drained variant loam, 0 to 2 percent slopes	Cn	Prime farmland	227.6	1.2%
NkrB	Nixon moderately well drained variant loam, 2 to 5 percent slopes	Cn	Prime farmland	20.9	0.1%
NktB	Nixon moderately well drained variant-Urban land complex, 0 to 5 percent slopes	Cx	Not prime farmland	495.5	2.5%
Total				1,986.5	10.1%
<i>Pawcatuck Series</i>					
PdwAv	Pawcatuck-Transquaking complex, 0-2% slopes, frequently flooded	Cx	Farmland of unique importance	1,424.0	7.3%
Total				1,424.0	7.3%

Appendix B. Major Soil Series in Edison					
Abbrv.	Map Unit Name	Type	Arability Potential	Acres	% of Township
<i>Parsippany Series</i>					
PbpA	Parsippany silt loam, 0 to 3 percent slopes	Cn	Not prime farmland	344.6	1.8%
PbpAt	Parsippany silt loam, 0 to 3 percent slopes, frequently flooded	Cn	Not prime farmland	190.5	1.0%
PbtAr	Parsippany very poorly drained variant silt loam, 0 to 3 percent slopes, rarely flooded	Cn	Not prime farmland	851.0	4.3%
Total				1,386.1	7.1%
<i>Haledon Series</i>					
HakA	Haledon loam, 0 to 3 percent slopes	Cn	Prime farmland	56.6	0.3%
HanA	Haledon silt loam, 0 to 3 percent slopes	Cn	Prime farmland	384.7	2.0%
HanB	Haledon silt loam, 3 to 8 percent slopes	Cn	Prime farmland	429.0	2.2%
HasA	Haledon-Urban land complex, 0 to 3 percent slopes	Cx	Not prime farmland	373.7	1.9%
HatB	Haledon-Urban land-Hasbrouck complex, 0 to 8 percent slopes	Cx	Not prime farmland	50.7	0.3%
Total				1,294.7	6.7%
<i>Lansdowne Series</i>					
LbtA	Lansdowne silt loam, 0 to 2 percent slopes	Cn	Statewide importance	23.2	0.1%
LbtB	Lansdowne silt loam, 2 to 6 percent slopes	Cn	Statewide importance	88.2	0.4%
LbuB	Lansdowne-Urban land complex, 0 to 6 percent slopes	Cx	Not prime farmland	795.4	4.1%
LbxA6	Lansdowne moderately deep variant silt loam, 0 to 2 percent slopes	Cn	Not prime farmland	89.1	0.5%
Total:				995.9	5.1%
Overall Total:				11,983.9	68.8%
<i>Source: NRCS Web Soil Survey, Accessed February 2020</i>					

Appendix C. Hydric Soil Ratings in Edison Township

Map Unit Symbol	Map Unit Name	Rating
AtsA	Atsion sand, 0 to 2 percent slopes, Northern Coastal Plain	95
BogB	Boonton loam, 3 to 8 percent slopes	0
BogC	Boonton loam, 8 to 15 percent slopes	0
BohC	Boonton moderately well drained gravelly loam, 8 to 15 percent slopes	0
BouB	Boonton-Urban land complex, 0 to 8 percent slopes	0
BouD	Boonton-Urban land complex, 15 to 25 percent slopes	0
BovB	Boonton-Urban land-Haledon complex, 0 to 8 percent slopes	0
CarbAt	Carlisle-Adrian mucks, 0 to 2 percent slopes, frequently flooded	100
DuuA	Dunellen-Urban land complex, 0 to 3 percent slopes	0
DuxA	Dunellen moderately well drained variant sandy loam, 0 to 2 percent slopes	5
DuxB	Dunellen moderately well drained variant sandy loam, 2 to 6 percent slopes	5
DuyB	Dunellen moderately well drained variant-Urban land complex, 0 to 6 percent slopes	5
EkaAr	Elkton loam, 0 to 2 percent slopes, rarely flooded	95
FapA	Fallsington loams, 0 to 2 percent slopes, Northern Coastal Plain	85
FavAr	Fallsington bedrock substratum variant loam, 0 to 2 percent slopes, rarely flooded	95
GamB	Galloway loamy sand, 0 to 5 percent slopes	10
HakA	Haledon loam, 0 to 3 percent slopes	10
HanA	Haledon silt loam, 0 to 3 percent slopes	5
HanB	Haledon silt loam, 3 to 8 percent slopes	0
HasA	Haledon-Urban land complex, 0 to 3 percent slopes	0
HatB	Haledon-Urban land-Hasbrouck complex, 0 to 8 percent slopes	15
HctA	Hasbrouck silt loam, 0 to 3 percent slopes	90
HctAr	Hasbrouck silt loam, 0 to 3 percent slopes, rarely flooded	90
KemD	Keyport sandy loam, 10 to 15 percent slopes	10
KeoA	Keyport loam, 0 to 2 percent slopes	15
KeoB	Keyport loam, 2 to 5 percent slopes	15
KkoB	Klinesville channery loam, 2 to 6 percent slopes	0
KkoC	Klinesville channery loam, 6 to 12 percent slopes	0
KkoE	Klinesville channery loam, 18 to 35 percent slopes	0
KkuB	Klinesville-Urban land complex, 0 to 6 percent slopes	0
LakB	Lakehurst sand, 0 to 5 percent slopes	10
LbtA	Lansdowne silt loam, 0 to 2 percent slopes	15
LbtB	Lansdowne silt loam, 2 to 6 percent slopes	10
LbuB	Lansdowne-Urban land complex, 0 to 6 percent slopes	10
LbxA6	Lansdowne moderately deep variant silt loam, 0 to 2 percent slopes	10

Appendix C. Hydric Soil Ratings in Edison Township

Map Unit Symbol	Map Unit Name	Rating
MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	100
MumAr	Mullica sandy loam, 0 to 2 percent slopes, rarely flooded	95
NknA	Nixon loam, 0 to 2 percent slopes	0
NknB	Nixon loam, 2 to 5 percent slopes	0
NkpB	Nixon-Urban land complex, 0 to 5 percent slopes	0
NkrA	Nixon moderately well drained variant loam, 0 to 2 percent slopes	5
NkrB	Nixon moderately well drained variant loam, 2 to 5 percent slopes	5
NktB	Nixon moderately well drained variant-Urban land complex, 0 to 5 percent slopes	5
PbpA	Parsippany silt loam, 0 to 3 percent slopes	90
PbpAt	Parsippany silt loam, 0 to 3 percent slopes, frequently flooded	100
PbtAr	Parsippany very poorly drained variant silt loam, 0 to 3 percent slopes, rarely flooded	100
PdwAv	Pawcatuck-Transquaking complex, 0 to 2 percent slopes, very frequently flooded	100
PHG	Pits, sand and gravel	0
PHM	Pits, clay	0
PssA	Psamments, 0 to 3 percent slopes	15
PstA	Psamments, sulfidic substratum, 0 to 3 percent slopes	15
PsuB	Psamments, waste substratum, 0 to 8 percent slopes	15
RehA	Reaville silt loam, 0 to 2 percent slopes	7
RehB	Reaville silt loam, 2 to 6 percent slopes	3
RemB	Reaville-Urban land complex, 0 to 6 percent slopes	0
RorAt	Rowland silt loam, 0 to 2 percent slopes, frequently flooded	5
SadC	Sassafras gravelly sandy loam, 5 to 10 percent slopes	0
SadD	Sassafras gravelly sandy loam, 10 to 15 percent slopes	0
SafB	Sassafras loam, 2 to 5 percent slopes	4
UdbB	Udorthents, bedrock substratum, 0 to 8 percent slopes	4
UdcB	Udorthents, clayey substratum, 0 to 8 percent slopes	0
UdrB	Udorthents, refuse substratum, 0 to 8 percent slopes	0
UdwuB	Udorthents, wet substratum-Urban land complex, 0 to 8 percent slopes	2
UR	Urban land	0
WATER	Water	0
WoeA	Woodstown sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	7

Source: NRCS Web Soil Survey

Appendix D. Soil Ratings for Agricultural Use in Edison Township	
Soil Type	Acres
Prime Agricultural Soils	
Boonton loam, 3 to 8 percent slopes	1,745.30
Dunnellen moderately well drained variant sandy loam, 0 to 2 percent slopes	223.36
Dunnellen moderately well drained variant sandy loam, 2 to 6 percent slopes	21.28
Haledon loam, 0 to 3 percent slopes	56.54
Haledon silt loam, 0 to 3 percent slopes	384.64
Haledon silt loam, 3 to 8 percent slopes	428.96
Keyport loam, 0 to 2 percent slopes	10.85
Nixon loam, 0 to 2 percent slopes	71.90
Nixon loam, 2 to 5 percent slopes	281.96
Nixon moderately well drained variant loam, 0 to 2 percent slopes	227.57
Nixon moderately well drained variant loam, 2 to 5 percent slopes	20.94
Sassafras loam, 2 to 5 percent slopes	3.18
Woodstown sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	4.37
Total Acreage: Prime Agricultural Soils	3,480.85
Farmland of Statewide Importance	
Boonton loam, 8 to 15 percent slopes	256.41
Boonton moderately well drained gravelly loam, 8 to 15 percent slopes	3.63
Galloway loamy sand, 0 to 5 percent slopes	39.24
Landsowne silt loam, 0 to 2 percent	23.20
Landsowne silt loam, 2 to 6 percent slopes	88.21
Reaville silt loam, 0 to 2 percent slopes	114.80
Reaville silt loam, 2 to 6 percent slopes	24.53
Sassafras gravelly sandy loam, 5 to 10 percent slopes	60.61
Elkton loam, 0 to 2 percent slopes, rarely flooded	25.64
Fallsington loams, 0 to 2 percent slopes, Northern Coastal Plain	16.87
Mullica sandy loam, 0 to 2 percent slopes, rarely flooded	208.07
Total Acreage: Farmland of Statewide Importance	861.21
Farmland of Unique Importance	
Atsion sand, 0 to 2 percent slopes, Northern Coastal Plain	145.30
Carlisle-Adrian mucks, 0 to 2 percent slopes, frequently flooded	7.37
Manahawkin muck, 0 to 2 percent slopes, frequently flooded	94.47
Pawcatuck-Transquaking complex, 0 to 2 percent slopes, very frequently flooded	1,423.71
Total Acreage: Farmland of Unique Importance	1,670.85
Farmland of Local Importance	
Rowland silt loam, 0 to 2 percent slopes, frequently flooded	71.09
Total Acreage: Farmland of Local Importance	71.09

Appendix E. Soil K Factors in Edison Township		
Map unit symbol	Map Unit Name	Rating
AtsA	Atsion sand, 0 to 2 percent slopes, Northern Coastal Plain	
BogB	Boonton loam, 3 to 8 percent slopes	
BogC	Boonton loam, 8 to 15 percent slopes	
BohC	Boonton moderately well drained gravelly loam, 8 to 15 percent slopes	0.15
BouB	Boonton-Urban land complex, 0 to 8 percent slopes	0.32
BouD	Boonton-Urban land complex, 15 to 25 percent slopes	0.32
BovB	Boonton-Urban land-Haledon complex, 0 to 8 percent slopes	0.32
CarbAt	Carlisle-Adrian mucks, 0 to 2 percent slopes, frequently flooded	
DuuA	Dunellen-Urban land complex, 0 to 3 percent slopes	0.28
DuxA	Dunellen moderately well drained variant sandy loam, 0 to 2 percent slopes	
DuxB	Dunellen moderately well drained variant sandy loam, 2 to 6 percent slopes	
DuyB	Dunellen moderately well drained variant-Urban land complex, 0 to 6 percent slopes	
EkaAr	Elkton loam, 0 to 2 percent slopes, rarely flooded	0.43
FapA	Fallsington loams, 0 to 2 percent slopes, Northern Coastal Plain	
FavAr	Fallsington bedrock substratum variant loam, 0 to 2 percent slopes, rarely flooded	0.32
GamB	Galloway loamy sand, 0 to 5 percent slopes	0.05
HakA	Haledon loam, 0 to 3 percent slopes	0.24
HanA	Haledon silt loam, 0 to 3 percent slopes	0.32
HanB	Haledon silt loam, 3 to 8 percent slopes	
HasA	Haledon-Urban land complex, 0 to 3 percent slopes	0.32
HatB	Haledon-Urban land-Hasbrouck complex, 0 to 8 percent slopes	0.24
HctA	Hasbrouck silt loam, 0 to 3 percent slopes	
HctAr	Hasbrouck silt loam, 0 to 3 percent slopes, rarely flooded	
KemD	Keyport sandy loam, 10 to 15 percent slopes	0.20
KeoA	Keyport loam, 0 to 2 percent slopes	0.37
KeoB	Keyport loam, 2 to 5 percent slopes	0.32
KkoB	Klinesville channery loam, 2 to 6 percent slopes	0.17
KkoC	Klinesville channery loam, 6 to 12 percent slopes	0.17
KkoE	Klinesville channery loam, 18 to 35 percent slopes	0.17
KkuB	Klinesville-Urban land complex, 0 to 6 percent slopes	0.17
LakB	Lakehurst sand, 0 to 5 percent slopes	
LbtA	Lansdowne silt loam, 0 to 2 percent slopes	0.32
LbtB	Lansdowne silt loam, 2 to 6 percent slopes	0.37
LbuB	Lansdowne-Urban land complex, 0 to 6 percent slopes	0.32

Appendix E. Soil K Factors in Edison Township

Map unit symbol	Map Unit Name	Rating
LbxA6	Lansdowne moderately deep variant silt loam, 0 to 2 percent slopes	0.32
MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	
MumAr	Mullica sandy loam, 0 to 2 percent slopes, rarely flooded	
NknA	Nixon loam, 0 to 2 percent slopes	0.24
NknB	Nixon loam, 2 to 5 percent slopes	0.24
NkpB	Nixon-Urban land complex, 0 to 5 percent slopes	0.24
NkrA	Nixon moderately well drained variant loam, 0 to 2 percent slopes	0.28
NkrB	Nixon moderately well drained variant loam, 2 to 5 percent slopes	0.28
NktB	Nixon moderately well drained variant-Urban land complex, 0 to 5 percent slopes	0.28
PbpA	Parsippany silt loam, 0 to 3 percent slopes	0.37
PbpAt	Parsippany silt loam, 0 to 3 percent slopes, frequently flooded	
PbtAr	Parsippany very poorly drained variant silt loam, 0 to 3 percent slopes, rarely flooded	0.37
PdwAv	Pawcatuck-Transquaking complex, 0 to 2 percent slopes, very frequently flooded	
PHG	Pits, sand and gravel	
PHM	Pits, clay	0.10
PssA	Psammments, 0 to 3 percent slopes	0.05
PstA	Psammments, sulfidic substratum, 0 to 3 percent slopes	0.05
PsuB	Psammments, waste substratum, 0 to 8 percent slopes	0.02
RehA	Reaville silt loam, 0 to 2 percent slopes	0.37
RehB	Reaville silt loam, 2 to 6 percent slopes	0.32
RemB	Reaville-Urban land complex, 0 to 6 percent slopes	0.37
RorAt	Rowland silt loam, 0 to 2 percent slopes, frequently flooded	0.37
SadC	Sassafras gravelly sandy loam, 5 to 10 percent slopes	0.10
SadD	Sassafras gravelly sandy loam, 10 to 15 percent slopes	0.10
SafB	Sassafras loam, 2 to 5 percent slopes	0.32
UdbB	Udorthents, bedrock substratum, 0 to 8 percent slopes	0.28
UdcB	Udorthents, clayey substratum, 0 to 8 percent slopes	0.15
UdrB	Udorthents, refuse substratum, 0 to 8 percent slopes	0.37
UdwuB	Udorthents, wet substratum-Urban land complex, 0 to 8 percent slopes	0.02
UR	Urban land	
WATER	Water	
WoeA	Woodstown sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	0.15
<i>Source: NRCS Web Soil Survey</i>		

Appendix F. Erosion Hazard (Road/Trail) in Edison Township

Tables — Erosion Hazard (Road, Trail) — Summary By Map Unit				
Summary by Map Unit — Middlesex County, New Jersey (NJ023)				
Summary by Map Unit — Union County, New Jersey (NJ039)				
Summary by Map Unit — Middlesex County, New Jersey (NJ023)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AtsA	Atsion sand, 0 to 2 percent slopes, Northern Coastal Plain	Slight	145.3	0.7%
BogB	Boonton loam, 3 to 8 percent slopes	Moderate	1,745.6	8.9%
BogC	Boonton loam, 8 to 15 percent slopes	Severe	256.5	1.3%
BohC	Boonton moderately well drained gravelly loam, 8 to 15 percent slopes	Moderate	3.6	0.0%
BouB	Boonton-Urban land complex, 0 to 8 percent slopes	Moderate	2,597.8	13.2%
BouD	Boonton-Urban land complex, 15 to 25 percent slopes	Severe	4.7	0.0%
BovB	Boonton-Urban land-Haledon complex, 0 to 8 percent slopes	Moderate	311.2	1.6%
CarbAt	Carlisle-Adrian mucks, 0 to 2 percent slopes, frequently flooded	Slight	7.4	0.0%
DuuA	Dunellen-Urban land complex, 0 to 3 percent slopes	Slight	150.9	0.8%
DuxA	Dunellen moderately well drained variant sandy loam, 0 to 2 percent slopes	Slight	223.4	1.1%
DuxB	Dunellen moderately well drained variant sandy loam, 2 to 6 percent slopes	Slight	21.3	0.1%
DuyB	Dunellen moderately well drained variant-Urban land complex, 0 to 6 percent slopes	Slight	89.8	0.5%
EkaAr	Elkton loam, 0 to 2 percent slopes, rarely flooded	Slight	25.6	0.1%
FapA	Fallsington loams, 0 to 2 percent slopes, Northern Coastal Plain	Slight	16.9	0.1%
FavAr	Fallsington bedrock substratum variant loam, 0 to 2 percent slopes, rarely flooded	Slight	16.8	0.1%
GamB	Galloway loamy sand, 0 to 5 percent slopes	Slight	39.2	0.2%
HakA	Haledon loam, 0 to 3 percent slopes	Slight	56.6	0.3%
HanA	Haledon silt loam, 0 to 3 percent slopes	Slight	384.7	2.0%
HanB	Haledon silt loam, 3 to 8 percent slopes	Moderate	429.0	2.2%
HasA	Haledon-Urban land complex, 0 to 3 percent slopes	Slight	373.7	1.9%
HatB	Haledon-Urban land-Hasbrouck complex, 0 to 8 percent slopes	Moderate	50.7	0.3%
HctA	Hasbrouck silt loam, 0 to 3 percent slopes	Slight	131.3	0.7%
HctAr	Hasbrouck silt loam, 0 to 3 percent slopes, rarely flooded	Slight	29.7	0.2%
KemD	Keyport sandy loam, 10 to 15 percent slopes	Moderate	1.5	0.0%
KeoA	Keyport loam, 0 to 2 percent slopes	Slight	2.5	0.0%
KeoB	Keyport loam, 2 to 5 percent slopes	Moderate	8.4	0.0%
KkoB	Klinesville channery loam, 2 to 6 percent slopes	Slight	331.6	1.7%
KkoC	Klinesville channery loam, 6 to 12 percent slopes	Moderate	25.2	0.1%
KkoE	Klinesville channery loam, 18 to 35 percent slopes	Severe	118.6	0.6%

KkuB	Klinesville-Urban land complex, 0 to 6 percent slopes	Slight	992.8	5.1%
LakB	Lakehurst sand, 0 to 5 percent slopes	Slight	13.6	0.1%
LbtA	Lansdowne silt loam, 0 to 2 percent slopes	Slight	23.2	0.1%
LbtB	Lansdowne silt loam, 2 to 6 percent slopes	Moderate	88.2	0.4%
LbuB	Lansdowne-Urban land complex, 0 to 6 percent slopes	Moderate	795.4	4.1%
LbxA6	Lansdowne moderately deep variant silt loam, 0 to 2 percent slopes	Slight	89.1	0.5%
MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	Slight	94.5	0.5%
MumAr	Mullica sandy loam, 0 to 2 percent slopes, rarely flooded	Slight	208.1	1.1%
NknA	Nixon loam, 0 to 2 percent slopes	Slight	71.9	0.4%
NknB	Nixon loam, 2 to 5 percent slopes	Moderate	282.0	1.4%
NkpB	Nixon-Urban land complex, 0 to 5 percent slopes	Moderate	888.6	4.5%
NkrA	Nixon moderately well drained variant loam, 0 to 2 percent slopes	Slight	227.6	1.2%
NkrB	Nixon moderately well drained variant loam, 2 to 5 percent slopes	Moderate	20.9	0.1%
NktB	Nixon moderately well drained variant-Urban land complex, 0 to 5 percent slopes	Moderate	495.5	2.5%
PbpA	Parsippany silt loam, 0 to 3 percent slopes	Slight	344.6	1.8%
PbpAt	Parsippany silt loam, 0 to 3 percent slopes, frequently flooded	Slight	190.5	1.0%
PbtAr	Parsippany very poorly drained variant silt loam, 0 to 3 percent slopes, rarely flooded	Slight	851.0	4.3%
PdwAv	Pawcatuck-Transquaking complex, 0 to 2 percent slopes, very frequently flooded	Slight	1,424.0	7.3%
PHG	Pits, sand and gravel	Not rated	313.6	1.6%
PHM	Pits, clay	Not rated	326.9	1.7%
PssA	Psammments, 0 to 3 percent slopes	Slight	275.0	1.4%
PstA	Psammments, sulfidic substratum, 0 to 3 percent slopes	Slight	67.1	0.3%
PsuB	Psammments, waste substratum, 0 to 8 percent slopes	Slight	390.9	2.0%
RehA	Reaville silt loam, 0 to 2 percent slopes	Slight	114.8	0.6%
RehB	Reaville silt loam, 2 to 6 percent slopes	Moderate	24.5	0.1%
RemB	Reaville-Urban land complex, 0 to 6 percent slopes	Moderate	31.3	0.2%
RorAt	Rowland silt loam, 0 to 2 percent slopes, frequently flooded	Slight	71.1	0.4%
SadC	Sassafras gravelly sandy loam, 5 to 10 percent slopes	Moderate	60.6	0.3%
SadD	Sassafras gravelly sandy loam, 10 to 15 percent slopes	Moderate	5.4	0.0%
SafB	Sassafras loam, 2 to 5 percent slopes	Moderate	3.2	0.0%

UdbB	Udorthents, bedrock substratum, 0 to 8 percent slopes	Moderate	95.5	0.5%
UdcB	Udorthents, clayey substratum, 0 to 8 percent slopes	Slight	56.0	0.3%
UdrB	Udorthents, refuse substratum, 0 to 8 percent slopes	Moderate	4.3	0.0%
UdwuB	Udorthents, wet substratum-Urban land complex, 0 to 8 percent slopes	Slight	250.7	1.3%
UR	Urban land	Not rated	2,426.0	12.4%
WATER	Water	Not rated	375.0	1.9%
WoeA	Woodstown sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	Slight	4.4	0.0%
Subtotals for Soil Survey Area			19,597.5	99.9%

Appendix G. Soil Limitations in Edison Township

Soils	Depth to Restrictive Feature (cm)	Drainage	Depth to water table (cm)	Ponding	Flooding	Available Water Capacity	Frost Action Potential	Risk of Corrosion Steel	Risk of Corrosion Concrete	Septic Limitations
AtsA	>200	Poorly drained	5	None	None	0.06	Moderate	High	High	Very Limited
BogB	76	Well drained	>200	None	None	0.13	Moderate	Low	High	Very Limited
BogC	76	Well drained	>200	None	None	0.13	Moderate	Low	High	Very Limited
BohC	58	Moderately well drained	61	None	None	0.07	Moderate	High	High	Very Limited
BouB	76	Well drained	>200	None	None	0.12	Moderate	High	High	Very Limited
BouD	76	Well drained	>200	None	None	0.12	Moderate	High	High	Very Limited
BovB	91	Moderately well drained	76	None	None	0.1	Moderate	Moderate	Moderate	Very Limited
CarbAt	>200	Very poorly drained	0	Frequent	Frequent	0.45	High	High	High	Very Limited
DuuA	>200	Well drained	>200	None	None	0.11	Moderate	High	High	Very Limited
DuxA	>200	Moderately well drained	84	None	None	0.12	Moderate	High	High	Very Limited
DuxB	>200	Moderately well drained	84	None	None	0.12	Moderate	High	High	Very Limited

Appendix G. Soil Limitations in Edison Township

Soils	Depth to Restrictive Feature (cm)	Drainage	Depth to water table (cm)	Ponding	Flooding	Available Water Capacity	Frost Action Potential	Risk of Corrosion Steel	Risk of Corrosion Concrete	Septic Limitations
DuyB	>200	Moderately well drained	84	None	None	0.12	Moderate	High	High	Very Limited
EkaAr	>200	Poorly drained	15	Rare	Rare	0.17	High	High	High	Very Limited
FapA	>200	Poorly drained	13	Occasional	None	0.12	High	High	High	Very Limited
FavAr	>200	Poorly drained	15	Rare	Rare	0.14	High	High	High	Very Limited
GamB	>200	Somewhat poorly drained	38	None	None	0.08	Low	Low	High	Very Limited
HakA	71	Somewhat poorly drained	31	None	None	0.13	Moderate	High	Moderate	Very Limited
HanA	61	Somewhat poorly drained	31	None	None	0.11	Moderate	High	Moderate	Very Limited
HanB	75	Somewhat poorly drained	20	None	None	0.13	Moderate	High	High	Very Limited
HasA	61	Somewhat poorly drained	31	None	None	0.11	Moderate	High	Moderate	Very Limited
HatB	71	Somewhat poorly drained	31	None	None	0.13	Moderate	High	Moderate	Very Limited
HctA	81	Poorly drained	8	None	None	0.14	High	High	Moderate	Very Limited
HctAr	81	Poorly drained	8	None	Rare	0.14	High	High	Moderate	Very Limited

Appendix G. Soil Limitations in Edison Township

Soils	Depth to Restrictive Feature (cm)	Drainage	Depth to water table (cm)	Ponding	Flooding	Available Water Capacity	Frost Action Potential	Risk of Corrosion Steel	Risk of Corrosion Concrete	Septic Limitations
KemD	>200	Moderately well drained	61	None	None	0.17	Moderate	High	High	Very Limited
KeoA	>200	Moderately well drained	76	None	None	0.17	Moderate	High	Moderate	Very Limited
KeoB	>200	Moderately well drained	61	None	None	0.17	Moderate	High	High	Very Limited
KkoB	30	Somewhat excessively drained	>200	None	None	0.09	Moderate	Moderate	High	Very Limited
KkoC	28	Somewhat excessively drained	>200	None	None	0.1	Moderate	Moderate	High	Very Limited
KkoE	36	Somewhat excessively drained	>200	None	None	0.08	Moderate	Moderate	High	Very Limited
KkuB	30	Well drained	>200	None	None	0.09	Moderate	Moderate	High	Very Limited
LakB	>200	Moderately well drained	76	None	None	0.08	Low	Low	High	Very Limited
LbtA	152	Somewhat poorly drained	53	None	None	0.16	Moderate	High	High	Very Limited
LbtB	152	Somewhat poorly drained	53	None	None	0.18	Moderate	High	Moderate	Very Limited

Appendix G. Soil Limitations in Edison Township

Soils	Depth to Restrictive Feature (cm)	Drainage	Depth to water table (cm)	Ponding	Flooding	Available Water Capacity	Frost Action Potential	Risk of Corrosion Steel	Risk of Corrosion Concrete	Septic Limitations
LbuB	152	Somewhat poorly drained	53	None	None	0.16	Moderate	High	High	Very Limited
LbxA6	64	Somewhat poorly drained	53	None	None	0.18	Moderate	High	High	Very Limited
MakAt	>200	Very poorly drained	0	Frequent	Frequent	0.23	High	High	High	Very Limited
MumAr	>200	Very poorly drained	8	None	Rare	0.11	High	High	High	Very Limited
NknA	>200	Well drained	>200	None	None	0.11	Moderate	Moderate	High	Very Limited
NknB	>200	Well drained	>200	None	None	0.11	Moderate	Moderate	High	Very Limited
NkpB	>200	Well drained	>200	None	None	0.11	Moderate	Moderate	High	Very Limited
NkrA	>200	Moderately well drained	76	None	None	0.12	Moderate	High	High	Very Limited
NkrB	>200	Moderately well drained	76	None	None	0.12	Moderate	High	High	Very Limited
NktB	>200	Moderately well drained	76	None	None	0.12	Moderate	High	High	Very Limited
PbpA	>200	Poorly drained	15	None	None	0.17	High	High	Moderate	Very Limited
PbpAt	>200	Poorly drained	7	Frequent	Frequent	0.14	High	High	Moderate	Very Limited

Appendix G. Soil Limitations in Edison Township

Soils	Depth to Restrictive Feature (cm)	Drainage	Depth to water table (cm)	Ponding	Flooding	Available Water Capacity	Frost Action Potential	Risk of Corrosion Steel	Risk of Corrosion Concrete	Septic Limitations
PbtAr	>200	Poorly drained	15	None	Rare	0.12	High	High	Moderate	Very Limited
PdwAv	>200	Very poorly drained	0	Frequent	Very frequent	0.17	High	Moderate	High	Very Limited
PHG	>200	Well drained	>200	None	None					Not Rated
PHM	>200	Somewhat poorly drained	31	None	None	0.14				Very Limited
PssA	>200	Well drained	122	None	None	0.07	Low	Low	High	Very Limited
PstA	>200	Moderately well drained	99	None	None	0.06	Low	Low	High	Very Limited
PsuB	>200	Well drained	>200	None	None	0.04	Low	Low	High	Very Limited
RehA	71	Somewhat poorly drained	46	None	None	0.13	Moderate	High	Moderate	Very Limited
RehB	58	Somewhat poorly drained	46	None	None	0.19	Moderate	High	High	Very Limited
RemB	71	Somewhat poorly drained	46	None	None	0.12	Moderate	High	Moderate	Very Limited
RorAt	>200	Moderately well drained	61	Frequent	Frequent	0.12	Moderate	High	Moderate	Very Limited
SadC	>200	Well drained	>200	None	None	0.12	Moderate	Moderate	High	Very Limited

Appendix G. Soil Limitations in Edison Township

Soils	Depth to Restrictive Feature (cm)	Drainage	Depth to water table (cm)	Ponding	Flooding	Available Water Capacity	Frost Action Potential	Risk of Corrosion Steel	Risk of Corrosion Concrete	Septic Limitations
SadD	>200	Well drained	183	None	None	0.12	Moderate	Moderate	High	Very Limited
SafB	>200	Well drained	>200	None	None	0.11	Moderate	Moderate	High	Very Limited
UdbB	76	Moderately well drained	77	None	None	0.14	Moderate	Low	High	Very Limited
UdcB	>200	Somewhat poorly drained	31	None	None	0.14	Moderate	High	Moderate	Very Limited
UdrB	>200	Well drained	>200	None	None	0.13	High	Low	Low	Somewhat Limited
UdwuB	>200	Moderately well drained	76	None	None		Low	High	High	Very Limited
UR	>200		>200	None	None					Not Rated
Water	>200		>200	None	None					Not Rated
WoeA	>200	Moderately well drained	61	None	None	0.13	Moderate	Moderate	High	Very Limited

Source: NRCS Web Soil Survey, Accessed February 2020

Appendix H. Soil Limitations for Building Site Development

Rating	Dwelling without Basements	Dwellings with Basements	Small Commercial Buildings
Not Rated	PHG (313.6) UR (2,426.0) Water (375.0) Total Acreage: 3,114.6 % of Township: 15.9%	PHG (313.6) UR (2,426.0) Water (375.0) Total Acreage: 3,114.6 % of Township: 15.9%	PHG (313.6) UR (2,426) Water (375) Total Acreage: 3114.6 % of Township: 15.9%
Not Limited	DuuA (150.9) DuxA (223.4) DuxB(21.3) DuyB (89.8) LakB (13.6) NknA (71.9) NknB (282.0) NkpB (888.6) NkrA (227.6) NkrB (20.9) NktB (495.5) PssA (275.0) PstA (67.1) PsuB (390.9) SadC (60.6) SafB (3.2) UdrB (4.3) UdwuB (250.7) Total Acreage: 3,537.6 % of Township: 18.0%	BogB (1,745.6) BouB (2,597.8) DuuA (150.9) NknA (71.9) NknB (282.0) NkpB (888.6) PsuB (390.9) SadC (60.6) SafB (3.2) UdrB (4.3) Total Acreage: 6,197.4 % of Township: 31.6%	DuuA (150.9) DuxA (223.4) DuyB (89.8) LakB (13.6) NknA (71.9) NkpB (888.6) NkrA (227.6) NktB (495.5) PssA (275.0) PstA (67.1) UdwuB (250.7) Total Acreage: 2,754.3 % of Township: 14.0%
Somewhat Limited	KemD (1.5) KeoA (2.5) KeoB (8.4) LbtA (23.2) LbtB (88.2) LbuB (795.4) LbxA6 (89.1) RehA (114.8) RehB (24.5) RemB (31.3) SadD (5.4)	BogC (256.5) DuxA (223.4) DuxB (21.3) DuyB (89.8) PssA (275.0) SadD (5.4)	DuxB (21.3) KeoA (2.5) KeoB (8.4) LbtA (23.2) LbtB (88.2) LbuB (795.4) LbxA6 (89.1) NknB (282.0) NkrB (20.9) PsuB (390.9) RehA (114.8)

Appendix H. Soil Limitations for Building Site Development

Rating	Dwelling without Basements	Dwellings with Basements	Small Commercial Buildings
	UdbB (95.5) WoeA (4.4) Total Acreage: 1284.1 % of Township: 6.5%		RehB (24.5) RemB (31.3) SafB (3.2) UdbB (95.5) UdrB (4.3) WoeA (4.4) Total Acreage: 1,999.9 % of Township: 10.2%
Very Limited	AtsA (145.3) BogB (1,745.6) BogC (256.5) BohC (3.6) BouB (2,597.8) BouD (4.7) BovB (311.2) CarbAt (7.4) EkaAr (25.6) FapA (16.9) FavAr (16.8) GamB (39.2) HakA (56.6) HanA (384.7) HanB (429.0) HasA (373.7) HatB (50.7) HctA (131.3) HctAr (29.7) KkoB (331.6) KkoC (25.2) KkoE (118.6) KkuB (992.8) MakAt (94.5) MumAr (208.1) PbpA (344.6) PbpAt (190.5) PbtAr (851.0) PdwAv (1,424.0) PHM (326.9) RorAt (71.1)	AtsA(145.3) BohC (3.6) BouD (4.7) BovB (311.2) CarbAt (7.4) EkaAr (25.6) FapA (16.9) FavAr (16.8) GamB (39.2) HakA (56.6) HanA (384.7) HanB (429.0) HasA (373.7) HatB (50.7) HctA (131.3) HctAr (29.7) KemD (1.5) KeoA (2.5) KeoB (8.4) KkoB (331.6) KkoC (25.2) KkoE (118.6) KkuB (992.8) LakB (13.6) LbtA (23.2) LbtB (88.2) LbuB (795.4) LbxA6 (89.1) MakAt (94.5) MumAr (208.1) NkrA (227.6)	AtsA (145.3) BogB (1,745.6) BogC (256.5) BohC (3.6) BouB (2,597.8) BouD (4.7) BovB (311.2) CarbAt (7.4) EkaAr (25.6) FapA (16.9) FavAr (16.8) GamB (39.2) HakA (56.6) HanA (384.7) HanB (429.0) HasA (373.7) HatB (50.7) HctA (131.3) HctAr (29.7) KemD (1.5) KkoB (331.6) KkoC (25.2) KkoE (118.6) KkuB (992.8) MakAt (94.5) MumAr (208.1) PbpA (344.6) PbpAt (190.5) PbtAr (851.0) PdwAv (1,424.0) PHM (326.9)

Appendix H. Soil Limitations for Building Site Development

Rating	Dwelling without Basements	Dwellings with Basements	Small Commercial Buildings
	UdcB (56.0)	NkrB (20.9) NktB (495.5) PbpA (344.6) PbpAt (190.5) PbtAr (851.0) PdwAv (1,424.0) PHM (326.9) PstA (67.1) RehA (114.8) RehB (24.5) RemB (31.3) RorAt (71.1) UdbB (95.5) UdcB (56.0) UdwbB (250.7) WoeA (4.4)	RorAt (71.1) SadC (60.6) SadD (5.4) UdcB (56.0)
	Total Acreage: 11,679.0 % of Township: 59.5%	Total Acreage: 9,431.8 % of Township: 48.1 %	Total Acreage: 11,746.4 % of Township: 59.9%

Source: NRCS Web Soil Survey, Accessed February 2020

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
AtsA	(V) saturated	1.00	(V) too sandy	1.00	(V) saturated	1.00
	zone**	1.00	saturated	1.00	zone**	1.00
	too sandy	1.00	zone**	1.00	too sandy	0.60
	ponding flooding	1.00	ponding		flooding ponding	1.00
BogB	(S) saturated	0.39	(S) dusty	0.01	(V) slope	1.00
	zone**	0.01	saturated	0.19	dusty	0.01-0.02
	dusty		zone**		saturated zone** gravel content	0.39-1.00 0.68
BogC	(S) slope	0.63	(S) slope	0.63	(V) slope	1.00
	dusty	0.01	dusty	0.01	dusty	0.01-0.02
	saturated	0.39	saturated	0.19	saturated	0.39-1.00
	zone**		zone**		zone** gravel content	0.68
BohC	(S) gravel	0.04-	(S) slope	0.63	(V) gravel	0.04-1.00
	content	0.44	saturated	0.19-	content	1.00
	slope	0.63	zone**	1.00	slope	0.00-0.02
	saturated	0.39	dusty	0.00-	dusty	0.39-1.00
	zone**	0.00	gravel	0.02	saturated	1.00
dusty		content	0.04	zone** bedrock***		
BouB	(S) dusty	0.00- 0.01	(S) dusty	0.00- 0.01	(V) slope dusty	1.00 0.01
BouD	(V) slope dusty	1.00 0.01	(V) slope dusty	1.00 0.01	(V) slope dusty	1.00 0.01

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
BovB	(S) dusty	0.01	(S) dusty saturated zone**	0.01 1.00	(V) slope gravel content dusty saturated zone**	1.00 0.37-0.39 0.01 1.00
CarbAt	(V) saturated zone** flooding ponding organic matter dusty	1.00 1.00 1.00 1.00 0.02	(V) ponding saturated zone** organic matter content flooding dusty	1.00 1.00 1.00 0.40 0.02	(V) saturated zone** organic matter content dusty flooding ponding	1.00 1.00 0.02 1.00 1.00
DuuA	(S) Dusty Saturated zone**	0.00- 0.01 0.98	(S) dusty saturated zone**	0.00- 0.01 0.75	(S) gravel content saturated zone** dusty slope	0.05 0.98 0.00-0.01 0.13
DuxA	(S) dusty	0.00	(S) dusty	0.00	(S) dusty	0.00
DuxB	(S) Dusty Saturated zone**	0.00 0.39	(S) dusty saturated zone**	0.00 0.19	(S) slope dusty saturated zone** bedrock*** gravel content	0.13-0.50 0.00 0.39 0.07 0.05
DuyB	(S) Dusty Saturated zone**	0.00 0.39	(S) dusty saturated zone**	0.00 0.19	(S) slope dusty saturated zone** bedrock*** gravel content	0.13 0.00 0.39 0.07 0.05

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
EkaAr	(V) saturated zone** flooding ponding slow water* dusty	1.00 1.00 1.00 0.22- 0.99 0.01- 0.05	(V) ponding saturated zone** slow water* dusty	1.00 1.00 0.22- 0.99 0.01- 0.05	(V) saturated zone** slow water* ponding dusty	1.00 0.22-0.99 1.00 0.01-0.05
FapA	(V) saturated zone** ponding slow water* dusty	1.00 1.00 0.94 0.00- 0.08	(S) saturated zone** slow water* dusty	0.19- 0.96 0.94 0.01- 0.03	(V) saturated zone** ponding dusty slow water*	1.00 1.00 0.00-0.08 0.85-0.94
FavAr	(V) saturated zone** flooding ponding dusty slow water*	1.00 1.00 1.00 0.05 0.99	(V) ponding saturated zone** dusty slow water	1.00 1.00 0.05 0.99	(V) saturated zone** ponding dusty slow water*	1.00 1.00 0.05 0.99
GamB	(V) saturated zone** too sandy flooding ponding dusty	1.00 0.81 1.00 1.00 0.01	(S) saturated zone** too sandy	0.94 0.50- 0.81	(V) saturated zone** too sandy ponding dusty	1.00 0.81-1.00 1.00 0.01
HakA	(V) saturated zone** dusty flooding ponding slow water*	1.00 0.01- 0.02 1.00 1.00 0.96	(S) saturated zone** dusty	1.00 0.01	(V) saturated zone** flooding ponding gravel content dusty slow water*	1.00 1.00 1.00 0.39-0.43 0.01-0.02 0.96

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
HanA	(V) saturated zone** dusty	1.00 0.02- 0.04	(S) saturated zone** dusty	1.00 0.02	(V) saturated zone gravel content dusty	1.00 0.05-0.39 0.02-0.04
HanB	(V) saturated zone** dusty	1.00 0.02	(V) saturated zone** dusty	1.00 0.02	(V) saturated zone** gravel content slope dusty	1.00 0.68 0.50-1.00 0.01
HasA	(V) saturated zone** dusty	1.00 0.02	(S) saturated zone** dusty	1.00 0.02	(V) saturated zone** gravel content dusty	1.00 0.39 0.02
HatB	(V) saturated zone** dusty flooding slow water*	1.00 0.01 1.00 0.96	(S) saturated zone** dusty	1.00 0.01	(V) saturated zone** slope gravel content dusty slow water*	1.00 0.13-1.00 0.39-0.43 0.01 0.96
HctA	(V) saturated zone** dusty flooding ponding slow water*	1.00 0.02- 0.05 1.00 1.00 0.96	(V) saturated zone** dusty ponding flooding slow water*	0.94- 1.00 0.03- 0.05 1.00 0.40 0.96	(V) saturated zone** gravel content flooding ponding dusty slow water*	1.00 0.39-0.43 1.00 1.00 0.02-0.05 0.96

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
HctAr	(V) saturated zone** flooding dusty slow water* ponding	1.00 1.00 0.01- 0.02 0.96 1.00	(V) saturated zone** dusty slow water* ponding flooding	0.94- 1.00 0.01- 0.02 0.96 1.00 0.40	(V) saturated zone** gravel content flooding ponding slow water* dusty	1.00 0.39-0.43 1.00 1.00 0.96 0.01-0.02
KemD	(S) slow water* slope saturated zone** dusty too sandy	0.99 0.84 0.39- 0.77 0.03 0.87	(S) slow water* slope saturated zone** dusty too sandy	0.99 0.84 0.19- 0.43 0.03 0.87	(V) slope slow water* saturated zone** dusty too sandy	1.00 0.99 0.39-1.00 0.01-0.03 0.87-1.00
KeoA	(S) slow water* dusty	0.96 0.01- 0.03	(S) slow water* dusty	0.96 0.01- 0.03	(S) slow water* dusty	0.96 0.01-0.03
KeoB	(S) slow water* saturated zone** dusty	0.99 0.39 0.01- 0.04	(S) slow water* saturated zone** dusty	0.99 0.19 0.01- 0.04	(S) slow water* slope saturated zone** dusty	0.99 0.50 0.39 0.01-0.04
KkoB	(V) bedrock*** gravel content dusty	1.00 0.92 0.03	(V) bedrock*** gravel content dusty	1.00 0.92 0.03	(V) gravel content bedrock*** slope dusty	1.00 1.00 0.13 0.03
KkoC	(V) bedrock*** gravel content slope dusty	1.00 0.92 0.04 0.01	(V) bedrock*** gravel content slope dusty	1.00 0.92 0.04 0.01	(V) gravel content slope bedrock*** dusty	0.56-1.00 1.00 0.16-1.00 0.01-0.02

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
KkoE	(V) slope bedrock*** gravel content dusty saturated zone**	1.00 1.00 0.92 0.01- 0.02 0.07- 1.00	(V) Slope bedrock*** gravel content dusty slope	1.00 1.00 0.92 0.01- 0.02 1.00	(V) gravel content slope dusty bedrock***	0.56-1.00 1.00 0.01-0.02 0.46-1.00
KkuB	(V) bedrock*** gravel content dusty	1.00 0.92 0.03	(V) bedrock*** gravel content dusty	1.00 0.92 0.03	(V) gravel content slope bedrock*** dusty	1.00 0.13 1.00 0.03
LakB	(V) too sandy saturated zone** flooding ponding	1.00 1.00 1.00 1.00	(V) too sandy saturated zone** ponding	1.00 1.00 1.00	(V) too sandy slope saturated zone** ponding	1.00 0.13 1.00 1.00
LbtA	(S) slow water* saturated zone** dusty	0.96 0.81 0.02	(S) slow water* saturated zone** dusty	0.96 0.48 0.02	(S) slow water* saturated zone** dusty	0.96 0.81 0.02
LbtB	(S) slow water saturated zone dusty	0.96 0.81 0.01- 0.02	(S) slow water* saturated zone** dusty	0.96 0.48 0.01- 0.02	(S) slow water* saturated zone** dusty gravel content slope	0.96 0.81 0.01-0.02 0.99 0.13-0.50
LbuB	(S) slow water* saturated zone** dusty	0.81 0.96 0.04- 0.05	(S) slow water* saturated zone** dusty	0.96 0.48 0.04- 0.05	(S) slow water* saturate zone** slope dusty	0.96 0.81 0.13 0.04-0.05

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
LbxA6	(S) slow water* saturated zone** dusty	0.96 0.81 0.05	(S) slow water* saturated zone** dusty	0.96 0.48 0.05	(S) slow water* saturated zone** dusty	0.96 0.81 0.05
MakAt	(V) saturated zone** flooding ponding organic matter content dusty too sandy	1.00 1.00 1.00 1.00 0.01- 0.05 1.00	(V) ponding saturated zone** organic matter content flooding dusty too sandy	1.00 1.00 1.00 0.40 0.01- 0.05 1.00	(V) saturated zone** organic matter content flooding ponding dusty too sandy	1.00 1.00 0.60-1.00 1.00 0.01-0.05 1.00
MumAr	(V) saturated zone** flooding dusty	1.00 1.00 0.00- 0.01	(V) saturated zone** dusty	1.00 0.00- 0.01	(V) saturated zone** dusty	1.00 0.00-0.01
NknA	(S) dusty slow water* saturated zone**	0.00- 0.05 0.96 0.81	(S) dusty slow water* saturated zone**	0.00- 0.05 0.96 0.48	(S) gravel content dusty saturated zone** slow water*	0.21-0.68 0.02-0.05 0.81 0.96
NknB	(S) dusty slow water* saturated zone**	0.02- 0.05 0.96 0.81	(S) dusty slow water* saturated zone**	0.02- 0.05 0.96 0.48	(S) slope gravel content saturated zone** dusty slow water*	0.13-0.50 0.21 0.81 0.02-0.05 0.96

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
NkpB	(S) dusty slow water* saturated zone**	0.02- 0.05 0.96 0.81	(S) dusty slow water* saturated zone**	0.02- 0.05 0.96 0.48	(S) gravel content slope slow water* dusty saturated zone**	0.21 0.13-0.50 0.96 0.02-0.05 0.81
NkrA	(S) dusty	0.00- 0.03	(S) dusty	0.00- 0.03	(S) gravel content dusty	0.21-0.68 0.00-0.03
NkrB	(S) dusty	0.02- 0.03	(S) dusty	0.02- 0.03	(S) slope gravel content dusty	0.50 0.21 0.02-0.03
NktB	(S) dusty	0.02- 0.03	(S) dusty	0.02- 0.03	(S) gravel content slope dusty	0.21 0.13-0.50 0.02-0.03
PbpA	(V) saturated zone** slow water* dusty flooding ponding	1.00 0.96 0.03- 0.05 1.00 1.00	(V) saturated zone** slow water* dusty ponding flooding	1.00 0.96 0.03- 0.05 1.00 0.40	(V) saturated zone** dusty flooding ponding slow water*	1.00 0.03-0.05 1.00 1.00 0.96
PbpAt	(V) saturated zone** flooding slow water* dusty ponding	1.00 1.00 0.22- 0.96 0.01- 0.02 1.00	(V) ponding saturated zone** slow water* flooding dusty	1.00 1.00 0.22- 0.96 0.40 0.01- 0.02	(V) saturated zone** slow water* flooding ponding dusty	1.00 0.22-0.96 1.00 1.00 0.01-0.02

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
PbtAr	(V) saturated	1.00	(V) saturated	1.00	(V) saturated	1.00
	zone**	1.00	zone**	0.96	zone**	0.96
	flooding	1.00	slow water*	0.03-	slow water*	0.03-0.05
	slow water*	0.03-	dusty	0.05	dusty	1.00
	dusty ponding	0.05 1.00	ponding	1.00	ponding gravel content	0.43
PdwAv	(V) saturated	1.00	(V) ponding	1.00	(V) saturated	1.00
	zone**	1.00	saturated	1.00	zone**	1.00
	flooding	1.00	zone**	1.00	flooding	1.00
	ponding	1.00	organic	1.00	ponding	1.00
	organic	1.00	matter	0.40-	salinity	0.08
	matter	0.00-	content	0.60	gravel	0.00-0.05
	content	0.05	salinity	0.00-	content	1.00
	salinity	1.00	flooding	0.05	dusty	1.00
	dusty		dusty	1.00	too sandy	
	too sandy		too sandy		organic matter content	
PHG	(N)		(N)		(N)	
PHM	(V) saturated	1.00	(V) too clayey	1.00	(V) saturated	1.00
	zone**	1.00	saturated	1.00	zone**	1.00
	too clayey	0.99	zone**	0.99	too clayey	0.03
	slow water*	0.03	slow water*	0.03	dusty	0.99
dusty		dusty		slow water*		
PssA	(V) too sandy	1.00	(V) too sandy	1.00	(V) too sandy	1.00
	saturated	1.00	saturated	1.00	saturated	1.00
	zone**	1.00	zone**	0.00	zone**	0.00
	dusty	1.00	dusty	1.00	dusty	1.00
	flooding ponding	1.00	ponding		ponding	

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
PstA	(V) salinity too sandy saturated zone** flooding ponding salinity dusty organic matter content	1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.05 1.00	(V) too sandy salinity ponding saturated zone** flooding organic matter content dusty	1.00 1.00 1.00 1.00 0.40- 0.60 1.00 0.05	(V) too sandy saturated zone** salinity ponding flooding dusty organic matter content	1.00 1.00 1.00 1.00 1.00 0.00-0.05 1.00
PsuB	(V) saturated zone** too sandy gravel content flooding ponding organic matter content salinity dusty	1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.05	(V) too sandy gravel content ponding saturated zone** organic matter content salinity flooding dusty	1.00 0.07 1.00 1.00 1.00 1.00 0.40- 0.60 0.05	(V) too sandy gravel content slope saturated zone organic matter content flooding ponding salinity dusty	1.00 1.00 0.50 1.00 1.00 1.00 1.00 1.00 0.05
RehA	(S) saturated zone** slow water* dusty	0.07- 0.98 0.96 0.02	(S) slow water* saturated zone** dusty	0.96 0.04- 0.75 0.02	(S) saturated zone** slow water* dusty slope	0.07-0.98 0.96 0.02 0.50
RehB	(S) saturated zone** dusty	0.07- 0.98 0.02	(S) saturated zone** dusty	0.04- 0.75 0.02	(S) saturated zone** bedrock*** slope gravel content dusty	0.07-0.98 0.95 0.50 0.06 0.02

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
RemB	(S) saturated zone** slow water* dusty	0.39- 0.98 0.96 0.01- 0.05	(S) slow water* saturated zone** dusty	0.96 0.19- 0.75 0.01- 0.05	(S) saturated zone** slope slow water* dusty bedrock***	0.81-0.98 0.13 0.96 0.05
RorAt	(V) saturated zone** dusty flooding ponding	0.39 0.02 1.00 1.00	(V) ponding flooding saturated zone** dusty slow water*	1.00 0.40 0.19- 1.00 0.02 0.22	(V) flooding ponding dusty saturated zone** slow water*	1.00 1.00 0.02 0.39-1.00 0.22
SadC	(V) dusty gravel content	0.00- 0.02 0.01- 0.88	(S) gravel content dusty	0.01- 0.88 0.00- 0.01	(V) slope gravel content dusty	1.00 1.00 0.00-0.01
SadD	(S) slope gravel content too sandy dusty	0.84 0.33 0.89 0.01	(S) slope gravel content dusty too sandy	0.84 0.33 0.01 0.89	(V) slope gravel content dusty too sandy	1.00 0.06-1.00 0.01 0.89
SafB	(S) saturated zone** dusty	0.39 0.00- 0.02	(S) dusty saturated zone**	0.00- 0.02 0.19- 0.96	(S) slope dusty saturated zone**	0.50 0.00-0.02 0.39
UdbB	(S) saturated zone** gravel content slow water* dusty	0.39- 0.98 0.05 0.96 0.00- 0.04	(S) gravel content slow water* dusty saturated zone**	0.05 0.96 0.00- 0.04 0.19- 0.75	(V) gravel content slope bedrock*** dusty saturated zone**	1.00 0.13 0.46-1.00 0.03-0.05 1.00

Appendix I. Values and Limitations of Soils in Edison for Recreational Use						
Map Symbol Soil Name	Camp Rating Limitations	Camp Area Value	Picnic Rating Limitations	Picnic Area Value	Playground Rating Limitations	Playground Area Value
UdcB	(V) saturated zone**	1.00	(V) too clayey	1.00	(V) saturated zone**	1.00
	too clayey	1.00	saturated zone**	1.00	too clayey	1.00
	slow water*	0.99	zone**	0.99	too clayey	0.03
	dusty	0.03	slow water*	0.03	dusty	0.99
UdrB	(S) dusty	0.01	(S) dusty	0.01	(S) slope	0.50
			gravel		0.04	
			content dusty		0.01	
UdwuB	(V) saturated zone**	1.00	(V) too sandy	1.00	(V) too sandy	1.00
	too sandy	1.00	ponding	1.00	gravel	1.00
	salinity	1.00	saturated	1.00	content	1.00
	flooding	1.00	zone**	1.00	saturated	1.00
	ponding	1.00	organic	1.00	zone**	1.00
	organic matter content	1.00	matter content	0.60	organic matter content	1.00
			salinity		content	
			flooding		flooding	
				ponding		
				salinity		
UR	N		N		(N)	
WATER	N		N		(N)	
WoeA	(S) saturated zone**	0.39	(S) saturated zone**	0.19	(S) saturated zone**	0.39
	too sandy	0.13	zone**	0.13	zone**	0.13
	dusty	0.01-	too sandy	0.01-	too sandy	0.01-0.03
		0.03	dusty	0.03	dusty	

**slow water: slow water movement through soil*
***saturated zone: depth to saturated zone*
****bedrock: depth to bedrock*
S: Somewhat Limited, V: Very Limited, N: Not Rated

Source: NRCS Web Soil Survey, Accessed February 2020

Appendix J. Rare Plant Species and Ecological Communities in Middlesex County		
Common Name	Scientific Name	State Status
Terrestrial Community		
Rice Cutgrass (Oriental Ladythumb, Marshpepper Knotweed) Coastal Plain Intermittent Pond Herbaceous Vegetation	<i>Leersia oryzoides - polygonum (caespitosum, hydropper)</i> herbaceous vegetation	
Vascular Plants		
Ear-leaf False Foxglove	<i>Agalinis auriculata</i>	
Yellow Giant-hyssop	<i>Agastache nepetoides</i>	
Large Water-plantain	<i>Alisma triviale</i>	E
Puttyroot	<i>Aplectrum hyemale</i>	E
Pale Indian Plantain	<i>Arnoglossum atriplicifolium</i>	E
Beach Wormwood	<i>Artemisia campestris ssp. caudata</i>	
Red Milkweed	<i>Asclepias rubra</i>	
White Milkweed	<i>Asclepias variegata</i>	
Whorled Milkweed	<i>Asclepias verticillata</i>	
Eastern Silvery Aster	<i>Aster concolor</i>	
Low Rough Aster	<i>Aster radula</i>	E
Estuary Burr-marigold	<i>Bidens bidentoides</i>	
Eaton's Beggar-ticks	<i>Bidens eatonii</i>	E
Marsh Water-starwort	<i>Callitriche palustris</i>	
Erect Bindweed	<i>Calystegia spithamea ssp. spithamea</i>	E
Hitchcock's Sedge	<i>Carex hitchcockiana</i>	
Louisiana Sedge	<i>Carex louisianica</i>	E
Pale Sedge	<i>Carex pallescens</i>	
Variable Sedge	<i>Carex polymorpha</i>	E
Retorse Sedge	<i>Carex retrorsa</i>	
Bottle-shaped Sedge	<i>Carex utriculata</i>	
Willdenow's Sedge	<i>Carex willdenowii var. willdenowii</i>	
Scarlet Indian-paintbrush	<i>Castilleja coccinea</i>	
Spiny Coontail	<i>Ceratophyllum echinatum</i>	E
Redbud	<i>Cercis canadensis var. canadensis</i>	E
Tall Thistle	<i>Cirsium altissimum</i>	
Purple Clematis	<i>Clematis occidentalis var. occidentalis</i>	
Pear Hawthorn	<i>Crataegus calpodendron</i>	E
Fireberry Hawthorn	<i>Crataegus chrysocarpa var. chrysocarpa</i>	
Blue Waxweed	<i>Cuphea viscosissima</i>	
Wild Comfrey	<i>Cynoglossum virginianum var. virginianum</i>	
Lancaster Flat Sedge	<i>Cyperus lancastriensis</i>	E
Toothed Tick-trefoil	<i>Desmodium cuspidatum var. cuspidatum</i>	

Appendix J. Rare Plant Species and Ecological Communities in Middlesex County		
Common Name	Scientific Name	State Status
Trailing Tick-trefoil	<i>Desmodium humifusum</i>	E
Cornel-leaf Aster	<i>Doellingeria infirma</i>	
Carolina Whitlow-grass	<i>Draba reptans</i>	E
American Waterwort	<i>Elatine americana</i>	
Matted Spike-rush	<i>Eleocharis intermedia</i>	
Narrow-leaf Fireweed	<i>Epilobium angustifolium ssp. circumvagum</i>	
Tall Boneset	<i>Eupatorium altissimum</i>	
Flowering Spurge	<i>Euphorbia corollata</i>	
Catesby's Gentian	<i>Gentiana catesbaei</i>	
Soapwort Gentian	<i>Gentiana saponaria var. saponaria</i>	
Sweet-scent Indian-plantain	<i>Hasteola suaveolens</i>	
Swamp-pink	<i>Helonias bullata</i>	E
Featherfoil	<i>Hottonia inflata</i>	E
Floating Marsh-pennywort	<i>Hydrocotyle ranunculoides</i>	E
Shore Quillwort	<i>Isoetes riparia var. riparia</i>	
Greene's Rush	<i>Juncus greenei</i>	
Cream Vetchling	<i>Lathyrus ochroleucus</i>	E
Pale Duckweed	<i>Lemna valdiviana</i>	E
Northern Blazing-star	<i>Liatris scariosa var. novae-angliae</i>	E
Southern Twayblade	<i>Listera australis</i>	
Northern Bog Club-moss	<i>Lycopodiella inundata</i>	
Climbing Fern	<i>Lygodium palmatum</i>	
Lowland Loosestrife	<i>Lysimachia hybrida</i>	
Green Adder's-mouth	<i>Malaxis unifolia</i>	E
Virginia Bunchflower	<i>Melanthium virginicum</i>	E
Nuttall's Mudwort	<i>Micranthemum micranthemoides</i>	E
Slender Water-milfoil	<i>Myriophyllum tenellum</i>	E
Whorled Water-milfoil	<i>Myriophyllum verticillatum</i>	E
Spotted Phlox	<i>Phlox maculata var. maculata</i>	
Downy Phlox	<i>Phlox pilosa var. pilosa</i>	E
Strawberry-tomato	<i>Physalis grisea</i>	
Husk-tomato	<i>Physalis pubescens var. integrifolia</i>	
Seaside Plantain	<i>Plantago maritima var. juncooides</i>	
Yellow Fringed Orchid	<i>Platanthera ciliaris</i>	
Southern Rein Orchid	<i>Platanthera flava var. flava</i>	E
Tubercled Rein Orchid	<i>Platanthera flava var. herbiola</i>	
Purple Fringeless Orchid	<i>Platanthera peramoena</i>	E
Racemed Milkwort	<i>Polygala polygama</i>	
Sea-beach Knotweed	<i>Polygonum glaucum</i>	E
Oakes' Pondweed	<i>Potamogeton oakesianus</i>	
Saltmarsh Alkali Grass	<i>Puccinellia fasciculata</i>	
Basil Mountain-mint	<i>Pycnanthemum clinopodioides</i>	E

Appendix J. Rare Plant Species and Ecological Communities in Middlesex County

Common Name	Scientific Name	State Status
Torrey's Mountain-mint	<i>Pycnanthemum torrei</i>	E
Water-plantain Spearwort	<i>Ranunculus ambigens</i>	
Rock Buttercup	<i>Ranunculus micranthus</i>	
Low Spearwort	<i>Ranunculus pusillus</i> var. <i>pusillus</i>	
Thread-leaf Water Buttercup	<i>Ranunculus trichophyllus</i> var. <i>trichophyllus</i>	
Rhodora	<i>Rhododendron canadense</i>	E
Coarse Grass-like Beaked-rush	<i>Rhynchospora recognita</i>	E
Orange Coneflower	<i>Rudbeckia fulgida</i> var. <i>fulgida</i>	E
Limestone Petunia	<i>Ruellia strepens</i>	
Large Marsh-pink	<i>Sabatia dodecandra</i> var. <i>dodecandra</i>	
Southern Arrowhead	<i>Sagittaria australis</i>	E
Tidal Arrowhead	<i>Sagittaria calycina</i> var. <i>spongiosa</i>	
Awl-leaf Arrowhead	<i>Sagittaria subulata</i>	
Saltmarsh Bulrush	<i>Schoenoplectus maritimus</i>	E
New England Bulrush	<i>Schoenoplectus novae-angliae</i>	
Small Skullcap	<i>Scutellaria leonardii</i>	E
Veined Skullcap	<i>Scutellaria nervosa</i>	
Sand-plain Blue-eyed Grass	<i>Sisyrinchium fuscatum</i>	
Elliott's Goldenrod	<i>Solidago elliotii</i>	
Prairie Goldenrod	<i>Solidago rigida</i> var. <i>rigida</i>	E
Stout Ragged Goldenrod	<i>Solidago squarrosa</i>	
Narrow-leaf Meadow-sweet	<i>Spiraea alba</i> var. <i>alba</i>	
Lace-lip Ladies'-tresses	<i>Spiranthes laciniata</i>	E
Long-leaf Rush-grass	<i>Sporobolus compositus</i> var. <i>compositus</i>	
Small Rush-grass	<i>Sporobolus neglectus</i>	E
Hyssop Hedge-nettle	<i>Stachys hyssopifolia</i>	
Hairy Hedge-nettle	<i>Stachys pilosa</i> var. <i>pilosa</i>	E
Seaside Arrow-grass	<i>Triglochin maritima</i>	E
Narrow-leaf Horse-gentian	<i>Triosteum angustifolium</i>	E
Humped Bladderwort	<i>Utricularia gibba</i>	
Purple Bladderwort	<i>Utricularia purpurea</i>	
Narrow-leaf Vervain	<i>Verbena simplex</i>	E
Highbush-cranberry	<i>Viburnum opulus</i> var. <i>americanum</i>	
American Purple Vetch	<i>Vicia americana</i> var. <i>americana</i>	E
Britton's Coast Violet	<i>Viola brittoniana</i> var. <i>brittoniana</i>	
Southern Wood Violet	<i>Viola hirsutula</i>	
Death-camus	<i>Zigadenus leimanthoides</i>	E

E: Native New Jersey plant species whose survival in the state or nation is in jeopardy

Source: NJ Natural Heritage Program

Appendix K. State Threatened and Species of Special Concern in Edison Township

Common Name	Scientific Name	Class	Feature Type	Landscape Project Rank	New Jersey Status	Federal Protection Status
American Kestrel	<i>Falco sparverius</i>	<i>Aves</i>	Non-breeding sighting	3	State Threatened	N/A
Bald Eagle	<i>Haliaeetus eucocephalus</i>	<i>Aves</i>	Foraging	4	State Endangered	N/A
Cattle Egret	<i>Bubulcus ibis</i>	<i>Aves</i>	Foraging	3	State Threatened	N/A
Cooper's Hawk	<i>Accipiter cooperii</i>	<i>Aves</i>	Nest	2	Special Concern	N/A
Glossy Ibis	<i>Plegadis falcinellus</i>	<i>Aves</i>	Foraging	2	Special Concern	N/A
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	<i>Aves</i>	Breeding Sighting	3	State Threatened	N/A
Great Blue Heron	<i>Ardea herodias</i>	<i>Aves</i>	Foraging	2	Special Concern	N/A
Little Blue Heron	<i>Egretta caerulea</i>	<i>Aves</i>	Foraging	2	Special Concern	N/A
Northern Harrier	<i>Circus cyaneus</i>	<i>Aves</i>	Breeding Sighting	4	State Endangered	N/A
Northern Harrier	<i>Circus cyaneus</i>	<i>Aves</i>	Nest	4	State Endangered	N/A
Northern Harrier	<i>Circus cyaneus</i>	<i>Aves</i>	Non-breeding Sighting	2	Special Concern	N/A
Osprey	<i>Pandion haliaetus</i>	<i>Aves</i>	Foraging	3	State Threatened	N/A

Appendix K. State Threatened and Species of Special Concern in Edison Township

Common Name	Scientific Name	Class	Feature Type	Landscape Project Rank	New Jersey Status	Federal Protection Status
Osprey	<i>Pandion haliaetus</i>	<i>Aves</i>	Nest	3	State Threatened	NA/
Peregrine Falcon	<i>Falco peregrinus</i>	<i>Aves</i>	Urban Nest	4	State Endangered	N/A
Pied-billed Grebe	<i>Podilymbus podiceps</i>	<i>Aves</i>	Breeding Sighting-Confirmed	4	State Endangered	N/A
Savannah Sparrow	<i>Passerculus sandwichensis</i>	<i>Aves</i>	Breeding Sighting	3	State Threatened	N/A
Snowy Egret	<i>Egretta thula</i>	<i>Aves</i>	Foraging	2	Special Concern	N/A
Wood Thrush	<i>Hylocichla mustelina</i>	<i>Aves</i>	Breeding Sighting	2	Special Concern	N/A
Yellow-crowned Night-heron	<i>Nyctanassa violacea</i>	<i>Aves</i>	Foraging	3	State Threatened	N/A
Yellow-crowned Night-heron	<i>Nyctanassa violacea</i>	<i>Aves</i>	Nesting Colony	3	State Threatened	N/A
Eastern Box Turtle	<i>Terrapene Carolina carolina</i>	<i>Reptilia</i>	Occupied Habitat	2	Special Concern	N/A
Wood Turtle	<i>Glyptemys insculpta</i>	<i>Reptilia</i>	Occupied Habitat	3	State Threatened	N/A

Source: NJDEP Landscape Project (3.3)

Appendix L. Classification Exception / Wellhead Restriction Areas				
CEA Name	Address	Program	Formation	Acres (GIS)
Lukoil Service Station #57208	1709 Oak Tree Rd	LSRP	Glacial Till	17.90
Lincoln Farms, Inc.	711 721 Route 1 S	RAP	Brunswick Fm	0.03
Edison Citgo	3875 Park Ave	LSRP	Englishtown Fm	0.33
L A Dreyfus Company (Former)	3775 Park Ave	RAP	Passaic Fm	0.58
Raritan Arsenal	2890 Woodbridge Ave	DEP	Raritan-Magothy	38.73
Amoco Service Station #842	430 Route 1 & Plainfield Ave	LSRP	Passaic Fm	2.58
Oak Tree Center Mall	1665 Oak Tree Dr	RAP	Passaic Fm	0.28
Electrolux Home Products - Edison Facility	2170 Route 27	LSRP	Brunswick Fm, Pensauken Fm	21.67
Inman Grove Shopping Center	1124A Inman Ave	RAP	Passaic Fm	10.08
Getty Service Station #56275 (Former)	1942 Route 27	LSRP	Passaic Fm	0.34
Lukoil Service Station #57317	2193 Route 27 & Vineyard Rd	RAP	Passaic Fm	2.11
Con-Lux Coatings Inc.	226 Talmadge Rd	RAP	Passaic Fm	0.60
Roosevelt County Park	Oakwood Ave	POST	Glacial Drift	0.30
Crown Cork and Seal	24 Kilmer Rd	RAP	Glacial Till, Passaic Fm	0.53
Terminal Services and Oil Company	720 Route 1 N	LSRP	Pensauken Fm	4.07
Wasseem Gas & Go Inc	881 Route 1 S	LSRP	Quaternary Age	0.62
National Food Stores VOC CEA	76 National Rd	RAP	Glacial Drift	0.35
Camp Kilmer	433 Plainfield Ave	DEP	Passaic Fm	6.15
Hess Station #30258 (Former) - CEA VOC	1555 Route 27	RAP	Passaic Fm	0.29
U-Haul Moving and Storage	110 Route 1	LSRP	Glacial Drift	1.27
Macy's Raritan Distribution Center - Historic Fill	401 Clearview Rd (Raritan Center)	VIC	Raritan-Magothy	56.10

Appendix L. Classification Exception / Wellhead Restriction Areas				
CEA Name	Address	Program	Formation	Acres (GIS)
Tops Plaza	1711 1783 Lincoln Highway	LSRP	Passaic Fm, Quaternary Age	0.13
ExxonMobil Edison Research Lab - Eastern Edge	2195 Route 27	LSRP	Passaic Fm, Quaternary Age	4.69
New York Times Co (Former)	3001 3003 Woodbridge Ave	LSRP	Passaic Fm	30.75
Exxon Service Station #34316	1171 Inman Ave	LSRP	Passaic Fm	1.05
Torsiello & Sons	27 Progress St	LSRP	Glacial Drift; Passaic Fm	0.75
Raritan Supply Co	301 Meadow Rd	RAP	Brunswick Fm	4.04
Acme Motors, Inc.	211 Woodbridge Ave	RAP	Brunswick Fm	0.19
Motor Machine Company Inc	1956 Woodbridge Ave	RAP	Passaic Fm	2.20
Edison Twp. Fire Station No 1	25 Plainfield Ave & Simpson Ave	LSRP	Pensauken Fm	0.47
ABZ Realty Transamerican	2850 Woodbridge Ave	POST	Pensauken Fm	14.14
Sunoco Service Station #0007-7297	1808 Woodbridge Ave	RAP	Pensauken Fm	1.10
Edison Shell - Gas USTs	890 Route 1	LSRP	Passaic Fm	0.15
Lukoil Service Station #572398 (Former)	1620 Oak Tree Rd	LSRP	Passaic Fm	2.06
ExxonMobil Edison Synthetics Plant - BTEX VOC Tics	2195 Route 27	LSRP	Passaic Fm, Quaternary Age	3.40
Shell Service Station 138342	33 Route 27	RAP	Passaic Fm	0.20
Open Road Honda	50 Route 1	LSRP	Pensauken Fm	5.11
Route 27 Well	1816 Lincoln Hwy	RAP	Passaic Fm	0.30
Middlesex Co Bridge - Executive Avenue	Executive Ave	LSRP	Passaic Fm	0.08
Little Flower Montessori - Historic Fill	2 Kilmer Rd	VIC	Passaic Fm	1.87
Frank Millman Distributors	8 Progress St	RAP	Passaic Fm	0.05
Oak Tree Bus Service Inc	2091 Oak Tree Rd; 2093 Oak Tree Rd	LSRP	Passaic Fm	5.40

Appendix L. Classification Exception / Wellhead Restriction Areas				
CEA Name	Address	Program	Formation	Acres (GIS)
Petro Stop Inc	1955 Lincoln Highway / Route 27	LSRP	Passaic Fm	0.12
B & L Tires	425 Plainfield Ave	RAP	Passaic Fm	0.09
Graham Packaging Plastic Products Inc	2900 Woodbridge Ave; 2899 Woodbridge Ave	RAP	Pensauken Fm	5.05
Chemical Insecticide Corp	125 Whitman Ave	DEP	Passaic Fm	69.35
ADT, Inc (former Automatic Catering)	58 Brunswick Ave	POST	Passaic Fm	0.25
ExxonMobil Edison Synthetics Plant - 1,2 DCA CEA	2195 Route 27	LSRP	Passaic Fm, Quaternary Age	0.96
Private Formulations Inc	460 Plainfield Ave	LSRP	Passaic Fm	6.45
Hess Service Station #30205	Route 27 & Parsonage Rd	LSRP	Passaic Fm	4.20
Edison DPW Garage	745 New Durham Rd	LSRP	Passaic Fm	7.02
Dogwood Pump Station	Teaberry Dr	LSRP	Glacial Till	0.14
BP Service Station #84856	2246 Lincoln Hwy Route 27	RAP	Brunswick Fm	0.16
Somfy Systems Inc	2 Sutton Pl	POST	Passaic Fm	0.04
Raritan Valley Bus Service	115 S Main St	RAP	Glacial Till	2.67
Talmadge Road Building	Talmadge Rd	LSRP	Passaic Fm	47.18
Speedway Service Station #3446	789 Amboy Ave	RAP	Quaternary Age	1.53
979 Amboy Avenue, LLC - CEA	979 Amboy Ave	LSRP	Glacial Drift	0.55
Nuodex, Inc	40 Nixon Lane	LSRP	Raritan-Magothy	0.11
Black Stone Petroleum Inc/Former Exxon #38909	641 Route 1 S & Wooding Ave	LSRP	Passaic Fm	0.57
Shilka Store (former US Oil Service Station)	2279 Woodbridge Ave	LSRP	Glacial Till	2.14
Astra Cleaners	1905 Route 27	LSRP	Passaic Fm	6.10
Air Products and Chemicals Inc	1680 Oak Tree Rd	LSRP	Passaic Fm	132.37
Superior Energy Corp (Former)	1 41 Glendale Ave	RAP	Quaternary Age	0.24
Stauffer Chemical Co	Meadow Rd	LSRP	Passaic Fm	34.87
Shell Service Station #138343	764 Durham Ave	RAP	Passaic Fm	0.03

Appendix L. Classification Exception / Wellhead Restriction Areas				
CEA Name	Address	Program	Formation	Acres (GIS)
Conlux Coatings Inc	226 Talmadge Rd	LSRP	Passaic Fm	0.84
Raritan Arsenal	2890 Woodbridge Ave	DEP	Raritan-Magothy	857.80
Thomas Edison Co Park Maintenance Garage	Mill Rd & 1 Patrol Rd	LSRP	Glacial Till	0.10
First Fidelity Bank	2850 Woodbridge Ave	POST	Passaic Fm	0.36
Roosevelt Care Center	1 Roosevelt Dr	LSRP	Glacial Till	0.20
Kin-Buc Landfill	383 Meadow Rd	DEP	Passaic Fm	62.76
<p>LSRP: Licensed Site Remediation Professional DEP: Under traditional case oversight by the NJDEP RAP: Remedial Action Permit POST: Post, No Further Action (NFA) Monitoring VIC: Virtual Institutional Control</p> <p><i>Source: NJDEP GIS Environmental Open Data, February 2020</i></p>				

Appendix M. Known Contaminated Sites in Edison Township			
Site Name	Site Location	CEA Status	Remediation Level
Speedway 3446	789 Amboy Ave	Active	C2
Berger Industries Inc	Edison Industrial Ctr & Rte. 1 S	Active	D
Raceway Menlo Park	1501 S Rt 1	Active	C3
Danny Petroleum LLC Dba Edison Shell	764 Durham Ave	Active-RAP*	
Shell Service Station 138342	33 Rte. 27	Active-RAP*	
Con-Lux Coatings Inc	226 Talmadge Rd	Active	D
Torsiello And Sons Inc	27 Progress St	Active	C2
The New York Times	3001 3003 Woodbridge Ave	Active	C2
Macy's Raritan Distribution Center	401 Clearview Rd (Raritan Center)	Active-RAP*	B
Amerchol Corporation	136 Talmadge Rd	Active-RAP*	
Ford Motor Co Edison Assembly Plant	939 Rt 1 S	Active	D
American Metal Moulding Co	8 Taylor Rd	Active	C1
Akzo Nobel Chemicals Inc	Meadow Rd	Active	D
Edison Research Laboratory	2195 Rt 27	Active	C2
The Schundler Co	150 Whitman Ave	Active	C2
Superior Energy Equipment Corp Former	1 41 Glendale Ave	Active	D
Edison Oil Corp	2246 Lincoln Hwy Rt 27	Active	C2
Fuel One	690 N Rt 1	Active	C2
Astra Cleaners	1697 Oak Tree Rd	Active	C1
Roosevelt Care Center	1 Roosevelt Dr	Active	C2
Edison Shell	890 Rt 1	Active	C2
Terminal Services and Oil Company	720 Rt 1 N	Active	C3
Best Block Company Incorporated	1025 Rte. 1	Active	B
Amg Retail I LLC #37	421 435 Rt 1 S	Active	C2
Raceway Edison Wooding	641 Rte. 1 S & Wooding Ave	Active	C2
Ryder Truck Rental #1782	47 National Rd	Active	
Raritan Oil Company Inc	401 Rt 1 S	Active	C2
Metro Stop Gas	279 Rt 1 & Oakland Ave	Active	C2
Raceway Edison Oak Tree Rd	1699 Oak Tree Rd	Active	C2
Central Gas Plant	101 Silver Lake Ave	Active	D

Appendix M. Known Contaminated Sites in Edison Township			
Site Name	Site Location	CEA Status	Remediation Level
Service Station 842 Former	Rte. 1 N & Plainfield Ave	Active	C2
Usepa Raritan Arsenal Edison Facility	2890 Woodbridge Ave	Active	D
Hess Station 30205	Rte. 27 & Parsonage Rd	Active	C2
Getty 56275	1942 Rt 27	Active	C2
Lukoil 57238 Former	1620 Oak Tree Rd	Active	C2
Public Works Garage	745 New Durham Rd	Active	C2
Graham Packaging Plastic Products Inc	2900 Woodbridge Ave	Active-RAP*	
Sunoco	1808 Woodbridge Ave	Active	C2
Edison State Police Station	2667 Woodbridge Ave	Active	C1
Air Products & Chemicals Inc	1680 Oak Tree Rd	Active	D
Edison Foam Processing	521 Sunfield Rd	Active	C2
Revlon Consumers Products Corp	55 Talmadge Rd	Active	D
Lamp Cleaners	9 Lincoln Hwy	Active	C2
Baxter Healthcare Corp	120 Raritan Center Parkway	Active-RAP*	
B & L Tire	425 Plainfield Ave	Active-RAP*	
Pharmaceutical Formulations Inc	460 Plainfield Ave	Active-RAP*	
Sunoco #0258-1973	3875 Park Ave	Active	C2
Lukoil #57208	1709 Oak Tree Rd	Active	D
Oak Tree Bus Service Inc	2091 Oak Tree Rd	Active	C2
Roosevelt County Park	Oakwood Ave	Active	C2
Municipal Complex Police Garage	100 Municipal Blvd	Active	B
Metex Technical Products	970 New Durham Rd	Active	C2
Kin Buc Landfill	383 Meadow Rd	Active	D
Lukoil #57317	2193 Rt 27 & Vineyard Rd	Active-RAP*	
Academy Die Casting & Plating Co	47 Langstaff Ave	Active	C2
Delta	1711 Rte. 27	Active	B
A&E Cleaners Inc	1905 Rt 27	Active	C2
Petro Stop Inc Dba Delta	1955 Lincoln Hwy Rt 27	Active	C2
Raceway Edison 27	1555 Rte. 27	Active-RAP*	
Kleenstar Menlo Park Cleaners	194 Lafayette Ave	Active	C2
Automatic Rolls Metroplex Properties	1 Gormet Ln	Active	C2
Fermag Technologies, Inc	80 Executive Ave	Active	C2
Automatic Catering/Food Concepts	58 Brunswick Ave	Active-RAP*	
H B Fuller Co	59 Brunswick Ave	Active	C2

Appendix M. Known Contaminated Sites in Edison Township			
Site Name	Site Location	CEA Status	Remediation Level
Delta	979 Amboy Ave	Active	C2
Delta Service Station	1065 Amboy Ave	Active	C2
Chemical Insecticide Corporation	125 Whitman Ave	Active	D
Ilr Sanitary Landfill	Mill Rd	Active-RAP*	
Thomas A Edison County Park	Mill Rd & 1 Patrol Rd	Active	C2
Trafalgar Gardens	21 34 Minebrook Rd	Active	B
3 Dey Place	3 Dey Pl	Active	C2
Edison Prince LLC	1095 Rt 1	Active-RAP*	
Transport Motor Systems Inc	100 Rte. 1 N	Active	C2
Raritan Arsenal	March Rd	Active	C1
Blue Spruce Ii	653 Raritan Center Pwy.	Active	C1
Summit Associates	Old Raritan Arsenal	Active	C2
Motor Machine Co Inc	1956 Woodbridge Ave	Active	C2
Edison Moving & Storage	110 Rte. 1	Active	C2
PSE&G Edison Gen Station	164 Silver Lake Ave	Active	C2
Talmadge Road Building Block 22 Lot 4.R	Talmadge Rd	Active	C2
100 Sweetwater Lane Building @ Raritan Center	100 Sweetwater Ln	Active-RAP*	
Dogwood Pump Station	Teaberry Dr	Active	C2
Heights Pump Station	Harmon Rd	Active	C1
Open Road Honda-BMW-Isuzu	50 Rte. 1	Active	C2
Continental Can Company	24 Kilmer Rd	Active-RAP*	
Reydel Volkswagen	2034 Rt 27	Active	C3
180 Raritan Center Parkway @ Raritan Center	180 Raritan Center Pkwy	Active-RAP*	
35 Ashley Road	35 Ashley Rd	Active	C1
Somfy Systems (Tenant)	2 Sutton Pl	Active - Post Rem	C2
Huls America Inc	40 Nixon Ln	Active	C3
Edison Generator Exchange	785 United States Rt 1	Active	C2
First Union National Bank	2850 Woodbridge Ave	Active - Post Rem	C2
Renora Incorporated	83 Main St	Active-RAP*	
Ideal Gas Products Incorporated	977 New Durham Rd	Active-RAP*	
Menlo Park Motors Inc	82 Rt 27	Active	C1
Sports Expressions	711 721 Rt 1 Sb	Active-RAP*	
Edison Krauzer	2279 Woodbridge Rd	Active	C2

Appendix M. Known Contaminated Sites in Edison Township			
Site Name	Site Location	CEA Status	Remediation Level
Electrolux Home Products	2170 Rte. 27	Active	C2
Edison Twp. Fire Station 1	25 Plainfield Ave & Simpson Ave	Active	C2
Edison Mobil	1171 Inman Ave	Active	C2
Muller Machinery Company Incorporated	135 Whitman Ave	Active	C2
Frank Millman Distributors Inc	8 Progress St	Active-RAP*	
Rt 27 Well	1816 Lincoln Hwy	Active-RAP*	
Edison One Commerce Center	3775 Park Ave	Active	C2
Romark Logistics	8 10 B Court S	Active	
Tar Properties	1115 Rt 1	Active - Post Rem	B
Bill's Service Center	2240 Woodbridge Ave	Active	C2
Raritan Valley Bus Service	115 S Main St	Active	C2
Inman Sports Club	1000 Inman Ave	Active	D
Handy Motors Inc / Bassita Corp., Inc	1840 Woodbridge Ave	Active	C2
Krauszer's Dairy Inc	76 National Rd	Active-RAP*	
Raritan Supply Co	301 Meadow Rd	Active	C2
American Can Company	108 Pierson Ave	Active-RAP*	
271 Meadow Road	271 Meadow Rd	Active	C2
25 Wisteria Street	25 Wisteria St	Active	C1
Inman Grove Shopping Center	1124a Inman Ave	Active-RAP*	
PSE&G Transformer Near 6 Mila Court	6 Mila Ct	Active	B
Sta Seal Inc	25 Montrose Rd	Active	B
Metex Corporation	206 Talmadge Rd	Active	C3
155 Clover Place @ Raritan Center	155 Clover Pl	Active-RAP*	
1682 Frank Street	1682 Frank St	Active	B
Liddle Ave & Amboy Ave GW Contamination	Liddle Ave & Amboy Ave	Active	C3
Stelton Coal & Feed Co	10 12 Fairview Ave	Active	C2
Landmark Diner	2068 Lincoln Hwy	Active	C2
Beechwood Shopping Center @ Edison	Woodbridge Ave	Active-RAP*	
PSE&G Transformer Near 485 Route 1	485 Rt 1	Active	B
Generated Materials Corp	327 Meadow Rd	Active	B
Festival Plaza	1711 1783 Lincoln Hwy	Active	C2
Former Residential Parcels	Rt 1 & Stony Rd	Active	B

Appendix M. Known Contaminated Sites in Edison Township			
Site Name	Site Location	CEA Status	Remediation Level
Lehigh Valley Rail Line	Greenway Rail Trail	Active	B
Jersey Truck Sales Former	842 N Rt 1	Active	C2
49 Lincoln Hwy Rt 27	49 Lincoln Hwy Rt 27	Active	C2
87 Loring Ave	87 Loring Ave	Active	C1
Nixon Shopping Center	2048 2064 Lincoln Hwy	Active	C2
Damico Shopping Center	999 Amboy Ave	Active	C2
Camp Kilmer	433 Plainfield Ave	Active	C3
Kislin Associates Inc	1217 Rt 1	Active	C2
Mtf Woodbridge Avenue	3111 3113 Woodbridge Ave	Active	B
Centre Place Condominiums @ Edison	1 62 Vincent Behan Blvd	Active-RAP*	
Heller Industrial Parks	220 Meadow Rd	Active	B
875 New Durham Road	875 New Durham Rd	Active-RAP*	
22 Stiles Road	22 Stiles Rd	Active	C1
Mm 88 NJTP S Truck Lane Gasoline Spill	Mm 88 NJ Tpke South Truck Ln	Active	B
Edison South Shell	881 Rt 1 S	Active	C2
40 Runyon Avenue	40 Runyon Ave	Active	C2
Oak Tree Center Mall	1655-1665 Oak Tree Rd	Active-RAP*	
Little Flower Montessori	2 Kilmer Rd	Active-RAP*	
1907 Oak Tree Road	1907 Oak Tree Rd	Active-RAP*	
Ktk Steel Drum Corporation	65 Midvale Rd	Active	C3
Federal Business Centers @ Raritan Center	225 Raritan Center Pkwy	Active-RAP*	
<i>Source: NJGIN Open Data Known Contaminated Site List for New Jersey (Non-Homeowner)</i>			

Classification Exception Area (CEA) Status:

Sites listed as Active-Remedial Action Permit (RAP) are for Limited or Restricted Use:

Limited – A limited restricted use Remedial Action Outcome (RAO) leaves contaminants on-site, above applicable standards, but for a limited timeframe.

Restricted Use – A restricted use RAO addresses contaminants that will remain on-site indefinitely. Human health and the environment are protected via institutional controls (e.g., deed notice) and engineering controls (e.g., cap).

Remediation Levels:

B: Single Phase Remedial Action - Remedial level associated with emergency response, simple removal activities of contaminants usually no impact to soil or groundwater.

C1: No Formal Design - Remedial level associated with simple sites, one or two contaminants localized to soil and the immediate spill or discharge area.

C2: Form Design - Remedial level associated with more complicated contaminant discharges such as multiple site spills and discharges, or more than one contaminant, with both soil and groundwater impacted or threatened.

C3: Multi-Phased Remedial Action, Unknown Discharge - Remedial level associated with highly complex and threatening sites. These sites can have multiple contaminants, some at high concentrations with unknown sources continuing to impact soils, groundwater, and possibly surface waters and potable water resources. These sites are dangerous for direct contact with contaminated soils.

D: Multi-Phased Remedial Action, Multiple Sources - Same conditions as C3 except that D levels are also usually designated Federal "Superfund Sites."

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