Environmental Resource Inventory

Township of Chesterfield
Burlington County, New Jersey

FEBRUARY 2025

DELAWARE VALLEY
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REGIONAL
PLANNING COMMISSION

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REGIONAL
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The Delaware Valley Regional Planning Commission (DVRPC) is the federally designated Metropolitan Planning Organization for the Greater Philadelphia region, established by an Interstate Compact between the Commonwealth of Pennsylvania and the State of New Jersey. Members include Bucks, Chester, Delaware, Montgomery, and Philadelphia counties, plus the City of Chester, in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties, plus the cities of Camden and Trenton, in New Jersey.

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Acknowledgements

The Chesterfield Township Environmental Resource Inventory (ERI) was funded by a grant from Sustainable NJ to the Chesterfield Environmental Commission and through the Work Program of the Delaware Valley Regional Planning Commission (DVRPC).

DVRPC assists local governments in completing plans and studies that balance the natural resources of communities in our region with transportation and development needs. As part of this work, DVRPC identifies and addresses local environmental issues such as land use, water quality and quantity, flooding, wildlife habitat, natural vegetation, open space, and recreation.

The following individuals were instrumental in the development of the ERI.

Chesterfield Township Environmental Commission

Nancy Scarafile – Chair
Sarah Dyson – Vice Chair
Karl Braun
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Rachel Dekovitch
Roseann Greenberg
Ryan Rathbun
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Rebecca Hughes - Committee Liaison

Chesterfield Township Government

Denise Koetas-Dale - Mayor

Funding

Funding support for this ERI was provided by Sustainable Jersey and the PSEG Foundation.

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Executive Summary

An Environmental Resource Inventory (ERI) identifies and describes the natural resources of a community—its soil, water, air, plants, and animals—which are fundamental to its character. Protection and wise use of those resources is essential to the health, safety, and welfare of current and future residents. The ERI provides a basis for municipal actions to preserve and use those resources, although it does not include recommendations to those ends. It is, instead, a compendium of existing information about a community's natural resources, presented in a form that is useful to a broad audience.

The ERI is an important tool for environmental commissions, open space committees, planning boards, and zoning boards of adjustment, enabling these groups to identify and prioritize environmental challenges and opportunities. When adopted into the master plan, the ERI can support the development of resource protection ordinances and resource-based land use planning.

Long known for its fertile farmland, Chesterfield Township has developed as an agricultural community and remains proud of its farming heritage today. In addition to its large amount of agricultural land, Chesterfield contains a variety of landscapes and natural resources including wooded wetlands, upland forests and numerous streams and waterways. Thanks to its location in the Inner Coastal Plain, Chesterfield contains expanses of flat land with high-quality soils that are ideal for agriculture.

Chesterfield has faced increasing development pressures in recent decades due to its central location in New Jersey, roughly 10 miles from Trenton and 40 miles from Philadelphia. In response, Chesterfield has integrated goals for preserving its natural resources into its master plans for over two decades. The township's 1997 master plan called for the adoption of a voluntary Transfer of Development Rights (TDR) program to preserve the township's agricultural character. This program would ultimately direct development into a single area in the northeast corner of the township, Old York Village, and preserve a large "sending area" (encompassing much of the rest of the township) for agriculture.

Each ERI reflects a particular moment in time. The last Natural Resources Inventory covering areas within Chesterfield was published in 2006 by AMEC Earth and Environmental, Inc., covering the Crosswicks Creek Watershed.

Several documents were used to prepare this ERI, including Chesterfield's 2006 Natural Resource Inventory of the Crosswicks Creek Watershed and its Master Plans and Master Plan Reexaminations dating back to 1997, as well as other reference works. All resources are listed in the **References** section at the end of this report (page 123). The maps and geographic data in this report are primarily derived from the New Jersey Department of Environmental Protection's (NJDEP's) Geographic Information System mapping and from the Landscape Project produced by the Endangered and Nongame Species Program of the New Jersey Division of Fish and Wildlife. This information is available on the NJDEP website, which provides access to data that may be updated in the future.

Chapter 1:

Chesterfield Overview

Chesterfield Township is located at the northern tip of Burlington County in central New Jersey. Bordered to the north by Crosswicks Creek and Hamilton Township in Mercer County, to the east by North Hanover Township, to the south by Bacon's Run, Assiscunk Creek, and Mansfield and Springfield Townships, and to the west by Bordentown Township, Chesterfield Township encompasses 21.45 square miles (13,728 acres) of land area and 0.14 square miles (90 acres) of water area.

Chesterfield's population in the 2020 U.S. Census was 9,422, which represents an increase of 23 percent from the 2010 population of 7,699 and an increase of 58 percent from the 2000 population of 5,958. The median household income is $159,609 (2021 Five-Year American Community Survey Estimates) and the poverty rate was 2.2 percent. There were 2,070 housing units in Chesterfield Township (2020 Decennial Census) and 2,279 total households.[1]

Preserved Farmland | Source: Chesterfield EC

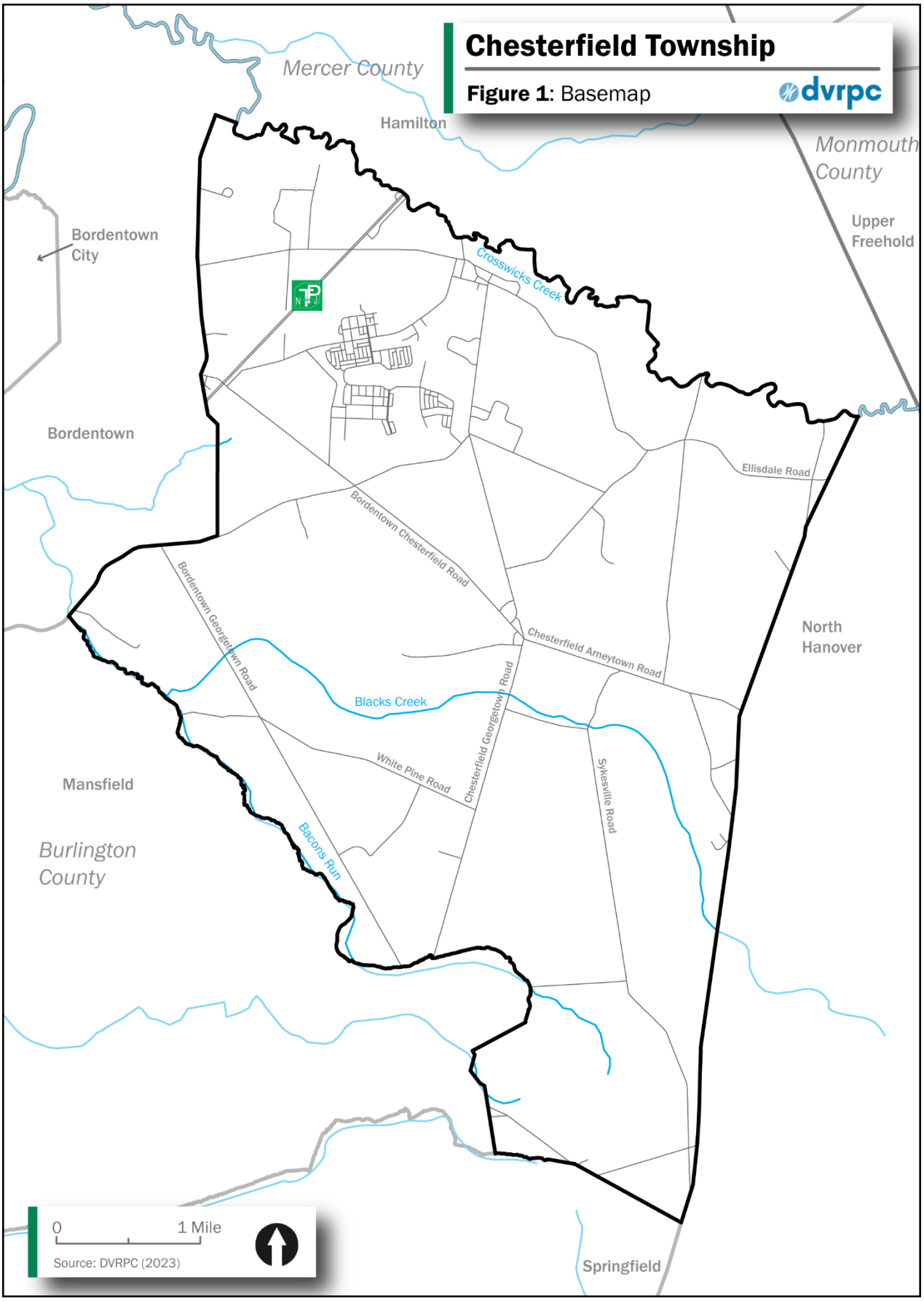
With rich soils and easy access to markets, Chesterfield has historically been a largely agricultural township. To protect this character and the agricultural industry from growing development pressures, Chesterfield leaders and community members embarked on the creation of a Transfer of Development Rights (TDR) Program in 1997. The TDR program was implemented and has been highly successful in enabling the township to retain its agricultural character while accommodating significant population growth over the past few decades. In 2017, the township adopted a Master Plan Amendment to continue guiding development and preservation of agricultural land in the township (see **Farmland Preservation** on page 110 for additional information).

[1] 2021 Five-Year American Community Survey Estimates

Chesterfield is served largely by two lane roads serviced by the county and by the township. Crosswicks-Chesterfield Road and Chesterfield-Georgetown Road bisect the township from north to south, while the Bordentown-Chesterfield Road, Chesterfield-Arneytown Road and Chesterfield-Jacobstown Road bisect the township from east to west. The NJ Turnpike, also known as Interstate 95 in this area, crosses the township in its northwest corner. The closest entrance to the highway is located on State Route 206, west of Chesterfield and within the boundaries of Bordentown Township. Other major roads in the township include Ward Avenue, which runs east-west in the north of the township; Chesterfield-Jacobstown Road, which branches southward from Chesterfield-Arneytown Road near the township's eastern border; and Bordentown-Georgetown Road, which runs near the township's southwestern border. Public transportation does not serve the township due to its predominantly rural nature; however, the River Line, a light rail line serviced by NJ Transit, runs parallel to the Delaware River to the west, as do two NJ Transit Bus Routes.

Notable waterways in Chesterfield include the Crosswicks Creek along the township's northern border, Blacks Creek, which bisects the township from east to west at roughly its midpoint, and Bacons Run, which forms the township's southern border. These waterways feed into the Delaware River to the county's west. There are also dozens of smaller tributaries throughout the township feeding into the main creeks.

Joint Base McGuire-Dix-Lakehurst, a military base containing facilities for the Army, Navy, and Air Force, is located approximately 1 mile to the southeast of the township's southern border. While proximity to the base does result in negative impacts, most notably in the form of noise pollution (training exercises and flyovers), the proximity of the base also provides ample benefits, such as economic benefits through job opportunities and increased local spending. It also provides additional security and support in emergencies as well as increased community support and funding to maintain the rural character of the area.


Chesterfield Township
Figure 1: Basemap
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
Crosswicks Creek
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
North Hanover
Blacks Creek
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
Mansfield
Bacons Run
Burlington County
Springfield
0
1 Mile
Source: DVRPC (2023)

Chapter 2:

Brief Township History

Early History

The area that currently makes up Chesterfield Township was inhabited for thousands of years by the Unami people of the Lenni Lenape Tribe. The first European settlers of the township were Quakers escaping religious persecution in England, who arrived in the township beginning in 1677. Many of these settlers came from Derbyshire, which was the seat of the 2nd Earl of Chesterfield, hence the township's name. The Quakers founded the Crosswicks Monthly Meeting in 1688, an institution that lives on to this day as the Crosswicks Friends Meeting.

Crosswicks Friends Meeting House | Source: Chesterfield EC

Chesterfield was formed in 1688 as one of New Jersey's 104 original townships, and until 1849 also included Bordentown Township and Bordentown City, extending to the Delaware River. The township was chartered in 1712. Three settlements that originally formed in the 1600s or 1700s within the current geographic boundaries of Chesterfield were Crosswicks in the north, Recklesstown in the middle, and Plattsburg in the south. Crosswicks was derived from the Lenni-Lenape language, and Recklesstown was named after Joseph Reckless, who purchased a mill in the area in 1712. Recklesstown's name was not changed until 1888, when Congressman Anthony Bullock had it changed to Chesterfield, to match the township's name. The settlement of Plattsburgh was renamed Sykesville in the mid-1800s in honor of George Sykes, the congressional representative from this district from 1845-47.

Early industries in the area included agriculture, glass, and iron, while the township was mostly agricultural, including both crop cultivation and livestock. Crosswicks Creek was used to transport goods; industries including mills and ice houses were located nearby. Crosswicks Village, along the creek in the township's northwest, developed early on, with settlers building houses along Main Street. In Recklesstown village, the Recklesstown Tavern was constructed in the first decade of the 18th century – this establishment lives on to this day as the Chesterfield Inn.

During the Revolutionary War there were engagements in the area, including a skirmish with the British troops who were occupying the meeting house in 1778. During the skirmish, the meeting house was struck by an

American cannonball, which remains lodged in the building to this day. In 1784, six years after occupation by the British, Quakers built the first school in the township on the grounds of the Crosswicks meeting house.

Development continued throughout the early 19th century, with the Crosswicks Post Office established in 1823, and an additional post office in Recklesstown/ Chesterfield Village that operated from 1830 to 1925. The Crosswicks Library Company was originally organized in 1817, making it one of the oldest continually running in the United States. The library was located on the 2nd floor of the community house before being moved into the former firehouse – its current home – in 1963.

Crosswicks Cemetery | Source: Chesterfield EC

Following the separation of Bordentown City and Bordentown Township from Chesterfield Township in 1849, Crosswicks became the cultural and social center of the township. Franklin Hall, a public hall meant for the exchange of knowledge and opinions on all subjects, was constructed on Main Street in Crosswicks in 1851. An African Methodist Episcopal congregation was organized after the Civil War, with the Grace A.M.E. Church being constructed in 1878.

Later Development

The township remained largely agricultural in the 19th and 20th centuries, as it does to this day. Even so, some notable changes have occurred. For example, the old Quaker burial ground, formerly located adjacent to the meeting house on the Crosswicks green, was moved across the creek because the embankment at the corner of Main and Church Streets blocked the view of oncoming traffic, so the side and front corner of the Crosswicks Community House was excavated and lowered to provide better sightlines. Some bodies remain at the original site.

The Albert C. Wagner State Youth Correctional Facility was built in the northwest corner of the township in 1934. In 2020, however, this facility was merged into the adjacent Garden State Youth Correctional Facility, built adjacent to Wagner in 1968, due to declining numbers of inmates since the early 2010s. In 2024, the state announced plans to build a new state-of-the-art women's prison at the eastern end of the Garden State Youth Correctional Facility site. If the facility proceeds as planned, it would be completed in mid-2027.

In 1951, a two-mile section of the New Jersey Turnpike was constructed through the northern corner of the township, running near the correctional facilities.

In October 1997, Chesterfield adopted a comprehensive master plan that called for the township to adopt a voluntary Transfer of Development Rights (TDR) program to preserve the township's agricultural character in the face of increasing development pressures in the region. This program would ultimately direct development to a single area in the northeast corner of the township, Old York Village, and preserve a large "sending area" (encompassing much of the rest of the township) for agriculture. The development of Old York Village since that time has included construction of housing units, the Chesterfield Elementary School, as well as shops and green space, including a conservation easement with wetlands designed to allow for aquifer recharge via stormwater infiltration. This concentrated development has resulted in the village having a compact and walkable design while including ample green space, with streets named after original Chesterfield farms to honor the community's history. In 2017, the township conducted a reexamination of its master plan resulting in a Master Plan Amendment. This amendment serves to guide development and preservation of agricultural land in the township and includes recommendations for historic preservation, community facilities planning, affordable housing, alternative energy and sustainability, wastewater management planning, zoning, farmland preservation, and redevelopment, among others. Construction of Old York Village is largely complete as of 2023.

Stormwater Management Facility in Old York Village | Source: Miles Owen

In 2020, the Chesterfield Township Committee authorized the Planning Board to conduct a preliminary redevelopment investigation to determine whether certain properties qualified as a Non-Condemnation Area in Need of Redevelopment in accordance with the criteria defined in New Jersey's Local Redevelopment and Housing Law (N.J.S.A 40A:12A-1 et seq.). In 2022, the Township Committee designated properties in three distinct areas of the township as a Non-condemnation Area in Need of Redevelopment.

In 2023, the Township Committee adopted a Redevelopment Plan for one of the three designated sites, near the Garden State Youth Correctional Facility. The Redevelopment Plan's goals include:

- Encouraging the location of attractive, well-organized, and clean businesses suited to the surrounding area and that fit into the existing land use framework
- Promoting the design of buildings that complement the agricultural character of the township and respect the scale of surrounding uses
- Protecting freshwater wetlands and stream corridors
- Integrating stormwater management and green infrastructure
- Providing for maximization of private investment through the attraction of qualified redevelopers capable of securing private financing commitments, utilizing tools provided by state redevelopment and tax laws, and demonstrating a financial commitment upon execution of a redevelopment agreement with the township

While the central goal of the township's Master Plan is to promote and retain agriculture, the township has identified this Redevelopment Area as an area that can accommodate some low-impact non-residential development without undermining the balance between agriculture, residential, and non-residential development.

Chapter 3:

Land Use and Land Cover

Land *cover* is a description of the landscape on the earth's surface, such as forest, grassland, cropland, or urban areas. Land *use* is a description of society's use of the land, such as commercial, residential, or agricultural use. The New Jersey Department of Environmental Protection (NJDEP) and the Delaware Valley Regional Planning Commission (DVRPC) have analyzed the land use and land cover of Burlington County (including Chesterfield) based on aerial photography. DVRPC produced aerial photographs of its nine-county region, including Chesterfield, as recently as 2022 as shown in **Figure 3: Aerial Imagery (2022)**. However, NJDEP's most recent land use/land cover data is from 2020, and the DVPRC land use data included here is from 2015, as shown in **Figure 4: NJDEP Land Use/Land Cover (2020)** and **Figure 5: DVRPC Land Use (2015)**.

As a rural community, Chesterfield contains a wide range of land use and land cover types. Shown in **Tables 1 and 2** below, NJDEP lists 6 major categories of land use/land cover in Chesterfield divided into over 50 more detailed land cover types. The largest of these major categories is agriculture, with an area comprising 47 percent of the total land area of the township. Cropland and pastureland make up most of this agricultural land, at 34 percent of the total land area. Orchards, vineyards, nurseries, and horticultural areas make up seven percent, and "other agriculture" makes up the remaining six percent of the total land area. The next most common major land use category is wetlands, which make up around 25 percent of the township's area. Of this, by far the largest category is deciduous wooded wetlands, which comprise 15 percent of the township's land area. Urban areas, which include residential, commercial, and industrial areas, make up almost 18 percent of the township, upland forest comprises just over nine percent, and open water and barren land together comprise just over one percent.

Table 1: General Land Use/Land Cover (2020)

Land Use	Area (Acres)	Percent of Total Land
Agriculture	6,377.32	46.43
Barren Land	41.06	0.30
Forest	1,272.35	9.26
Urban	2,458.33	17.90
Water	134.97	0.98
Wetlands	3,451.90	25.13
Total	**13,735.93**	**100%**

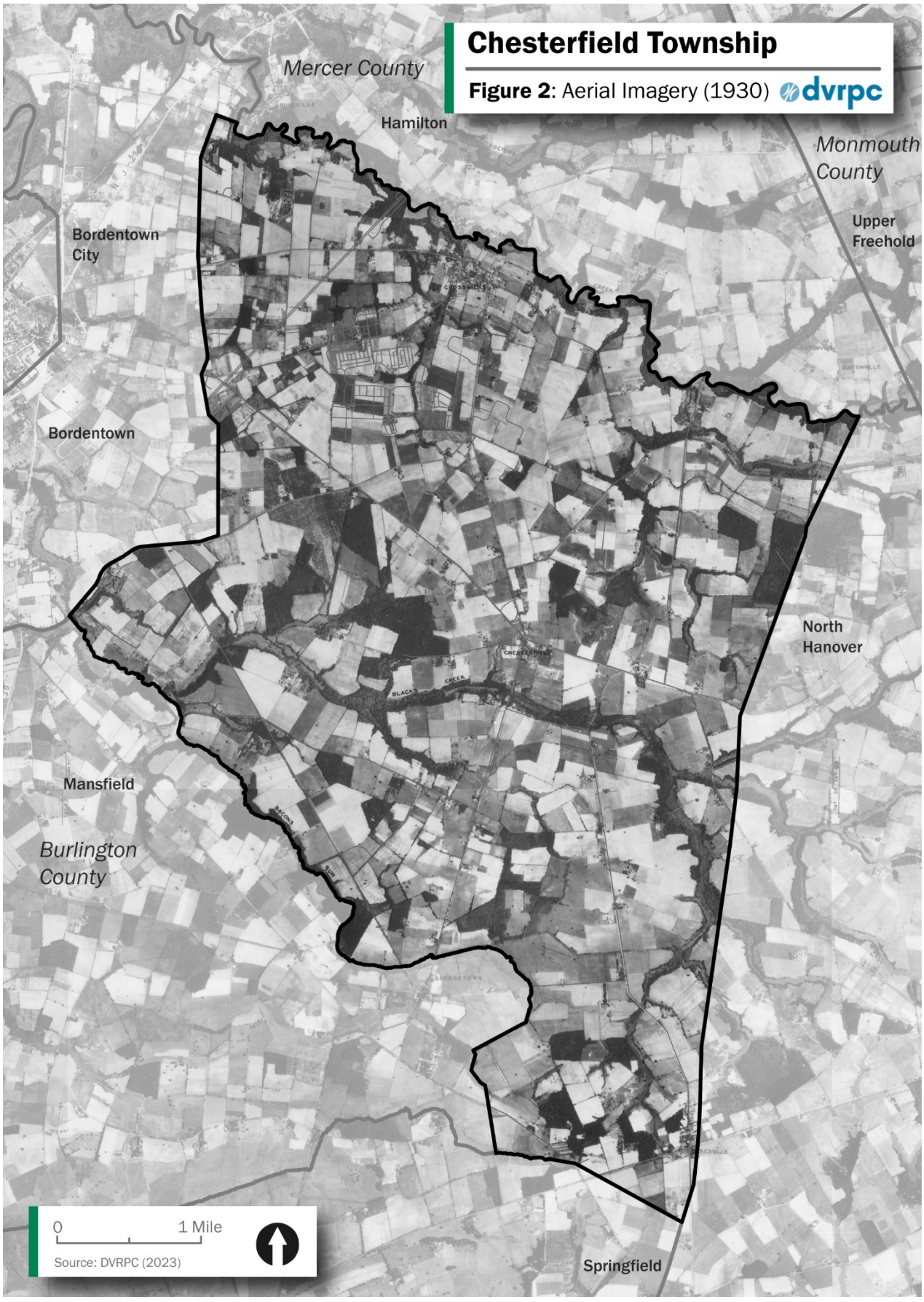
Source: NJDEP, 2020

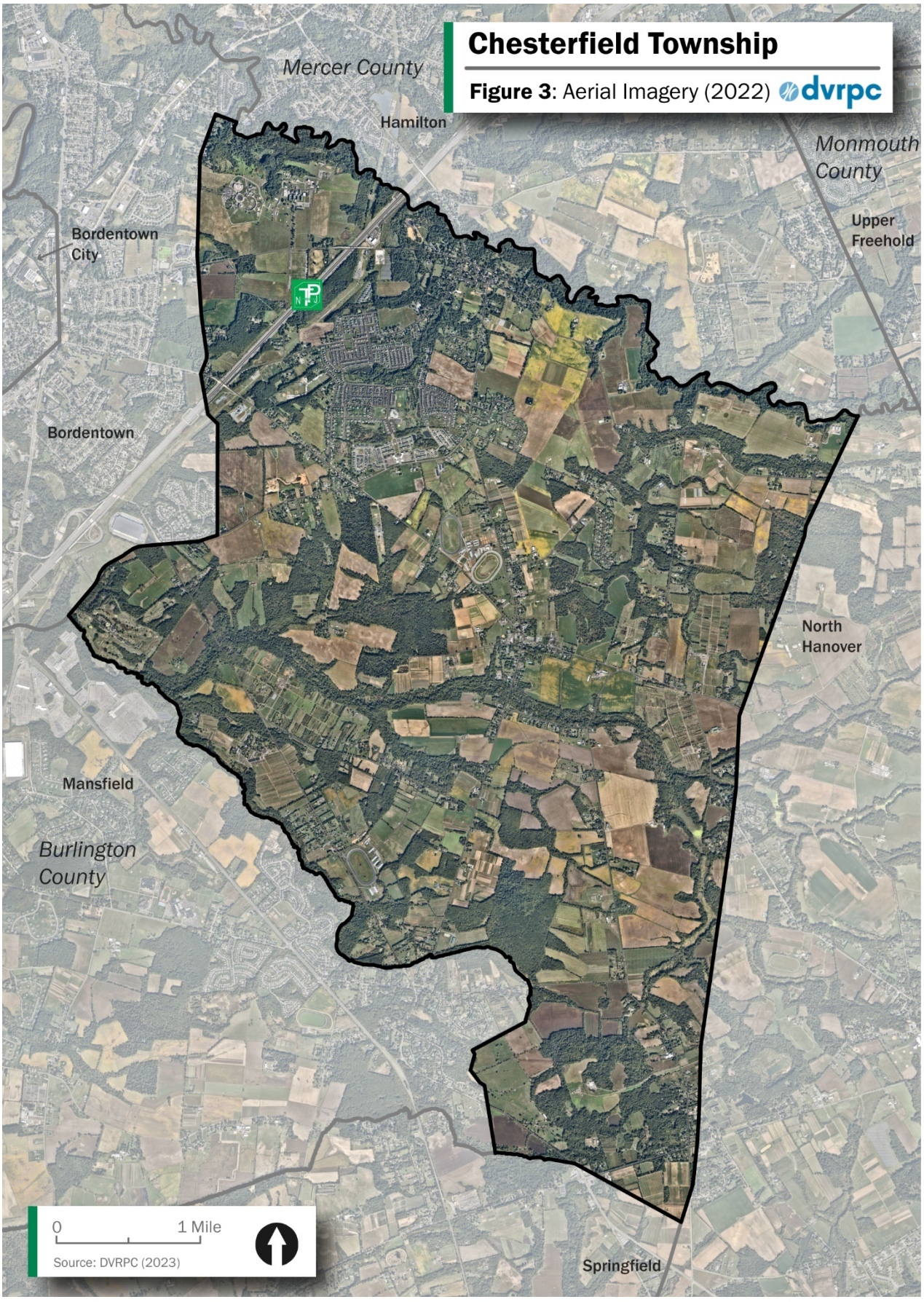
Table 2: Detailed Land Use/Land Cover (2020)

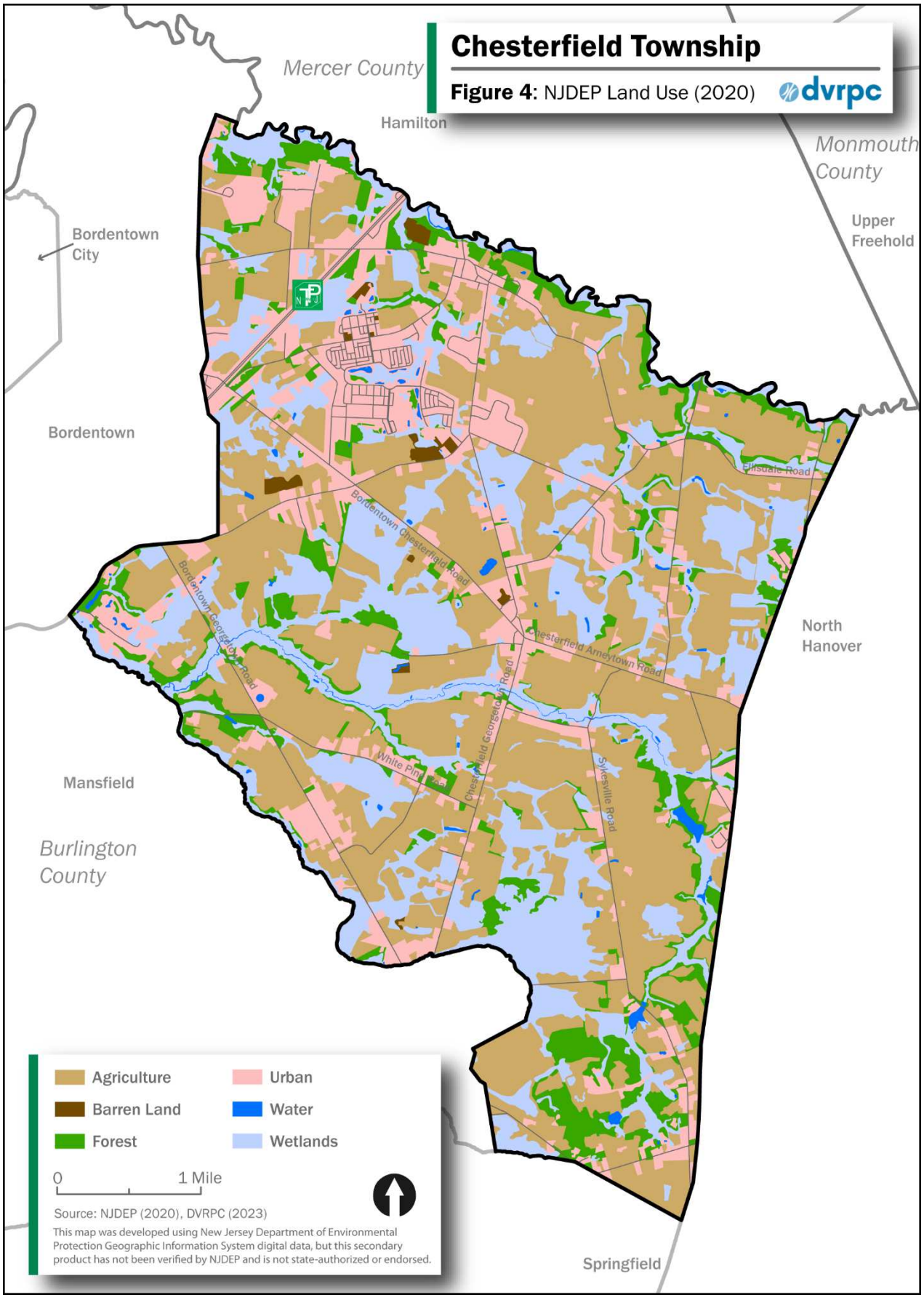
General LU/LC Class	Detailed Land Use/Land Cover Class	Area (acres)	Percent
Agriculture	Confined feeding operations	9.40	0.07%
Agriculture	Cropland and pastureland	4,604.31	33.52%
Agriculture	Orchards/vineyards/nurseries/horticultural areas	908.55	6.61%
Agriculture	Other agriculture	855.07	6.23%
Barren land	Extractive mining	28.78	0.21%
Barren land	Transitional areas	12.28	0.09%
Forest	Coniferous forest (>50% crown closure)	3.95	0.03%
Forest	Coniferous forest (10-50% crown closure)	2.32	0.02%
Forest	Deciduous brush/shrubland	79.59	0.58%
Forest	Deciduous forest (>50% crown closure)	853.12	6.21%
Forest	Deciduous forest (10-50% crown closure)	123.53	0.90%
Forest	Mixed deciduous/coniferous brush/shrubland	75.76	0.55%
Forest	Mixed forest (>50% coniferous with >50% crown closure)	14.30	0.10%
Forest	Mixed forest (>50% deciduous with >50% crown closure)	18.91	0.14%
Forest	Mixed forest (>50% deciduous with 10-50% crown closure)	37.44	0.27%
Forest	Old field (< 25% brush covered)	62.87	0.46%
Forest	Plantation	0.55	0.00%
Urban	Athletic fields (schools)	8.94	0.07%
Urban	Cemetery	1.41	0.01%
Urban	Commercial/services	135.74	0.99%
Urban	Industrial	13.57	0.10%
Urban	Major roadway	60.89	0.44%
Urban	Other urban or built-up land	171.09	1.25%
Urban	Recreational land	212.94	1.55%
Urban	Residential, high density or multiple dwelling	28.62	0.21%
Urban	Residential, rural, single unit	1106.33	8.05%

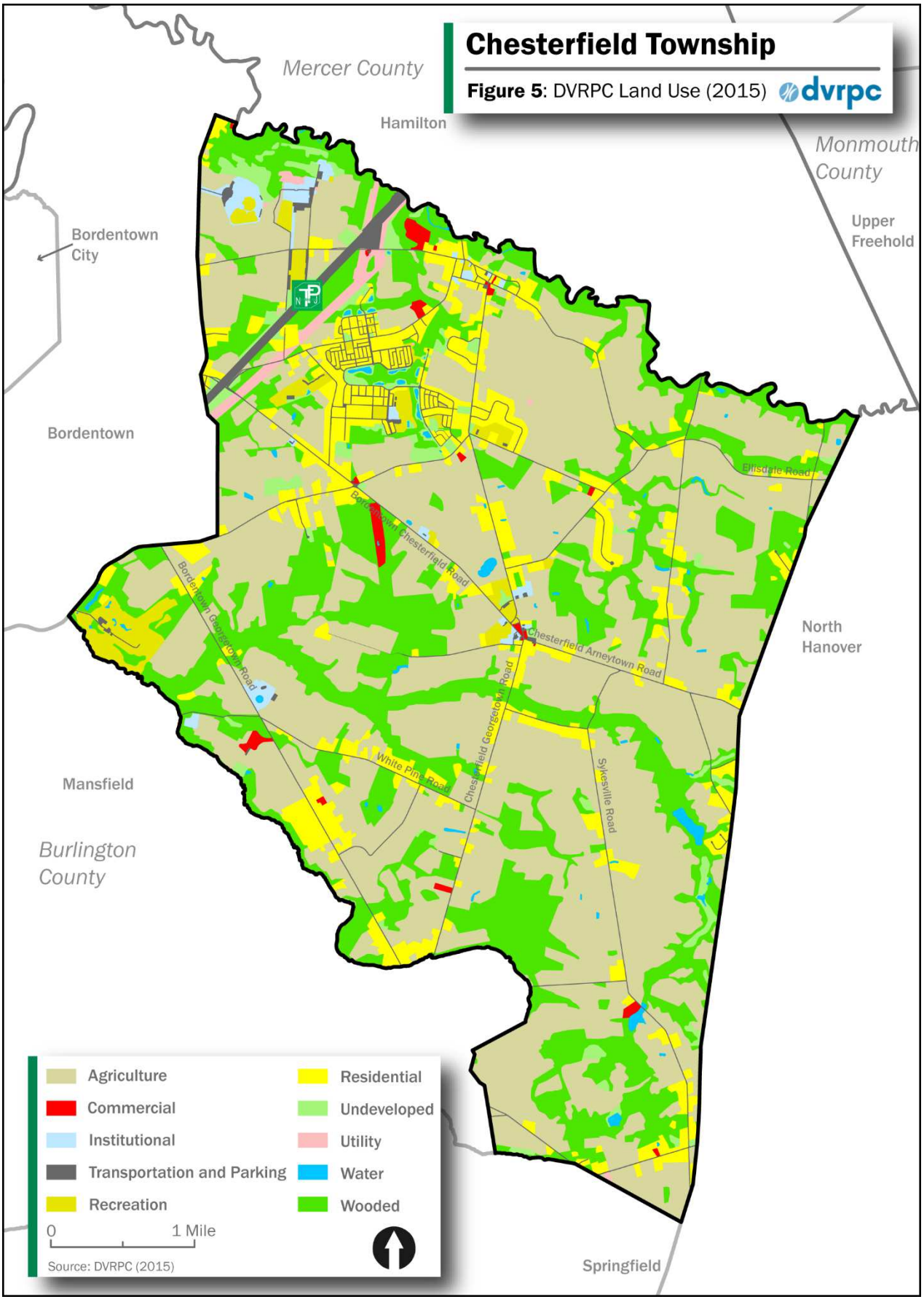
General LU/LC Class	Detailed Land Use/Land Cover Class	Area (acres)	Percent
Urban	Residential, single unit, low density	274.08	2.00%
Urban	Residential, single unit, medium density	270.28	1.97%
Urban	Stormwater basin	63.96	0.47%
Urban	Transportation/communication/utilities	59.84	0.44%
Urban	Upland rights-of-way developed	50.64	0.37%
Water	Artificial lakes	82.78	0.60%
Water	Bridge over water	0.39	0.00%
Water	Natural lakes	3.20	0.02%
Water	Streams and canals	48.60	0.35%
Wetlands	Agricultural wetlands (modified)	949.92	6.92%
Wetlands	Coniferous scrub/shrub wetlands	0.23	0.00%
Wetlands	Deciduous scrub/shrub wetlands	132.41	0.96%
Wetlands	Deciduous wooded wetlands	2,072.37	15.09%
Wetlands	Disturbed wetlands (modified)	60.79	0.44%
Wetlands	Former agricultural wetland (becoming shrubby, not built-up)	21.59	0.16%
Wetlands	Herbaceous wetlands	77.51	0.56%
Wetlands	Managed wetland in built-up maintained rec area	61.77	0.45%
Wetlands	Managed wetland in maintained lawn greenspace	5.91	0.04%
Wetlands	Mixed scrub/shrub wetlands (coniferous dom.)	1.24	0.01%
Wetlands	Mixed scrub/shrub wetlands (deciduous dom.)	38.63	0.28%
Wetlands	Mixed wooded wetlands (deciduous dom.)	4.06	0.03%
Wetlands	Wetland rights-of-way	25.47	0.19%
Total		**13,735.93**	**100%**

Source: NJDEP, 2020


Chesterfield Township
Figure 2: Aerial Imagery (1930)
dvrpc
Mercer County
Hamilton
Monmouth County
Bordentown City
Upper Freehold
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
0
1 Mile
Source: DVRPC (2023)


Chesterfield Township
Figure 3: Aerial Imagery (2022) dvrpc
Mercer County
Hamilton
Monmouth County
Bordentown City
Upper Freehold
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
0
1 Mile
Source: DVRPC (2023)


Chesterfield Township
Figure 4: NJDEP Land Use (2020)
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Georgetown Road
Chesterfield Arneytown Road
Sykesville Road
Elmsdale Road
White Pine Trail
Agriculture
Barren Land
Forest
Urban
Water
Wetlands
0
1 Mile
Source: NJDEP (2020), DVRPC (2023)
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.


Chesterfield Township
Figure 5: DVRPC Land Use (2015)
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
Ellisdale Road
Agriculture
Commercial
Institutional
Transportation and Parking
Recreation
Residential
Undeveloped
Utility
Water
Wooded
0
1 Mile
Source: DVRPC (2015)

DVRPC's land use assessments focus more on human activities and development of land, rather than vegetated and natural land cover types, which are shown in more detail on NJDEP's maps, reflecting the differing missions of the two agencies. According to DVRPC, 54.1 percent of the township is agricultural, 25.7 percent is wooded, and 10.7 percent is residential (Note: DVRPC does not identify "wetlands" as a land use type. Therefore, wooded wetlands are classified as "wooded."). Referring to **Table 3**, the rest is a combination of commercial, institutional, recreation, transportation, utility, undeveloped, and water.

Table 3: DVRPC Land Use

Land Use	Area (acres)	Percent
Agriculture	7,424.41	54.08%
Commercial	72.92	0.53%
Institutional	132.35	0.96%
Recreation	283.77	2.07%
Residential	1,471.63	10.72%
Transportation	291.32	2.12%
Utility	99.06	0.72%
Undeveloped	315.55	2.30%
Water	108.46	0.79%
Wooded	3,528.54	25.70%
Total	**13,728.01**	**100.0%**

Source: DVRPC, 2015

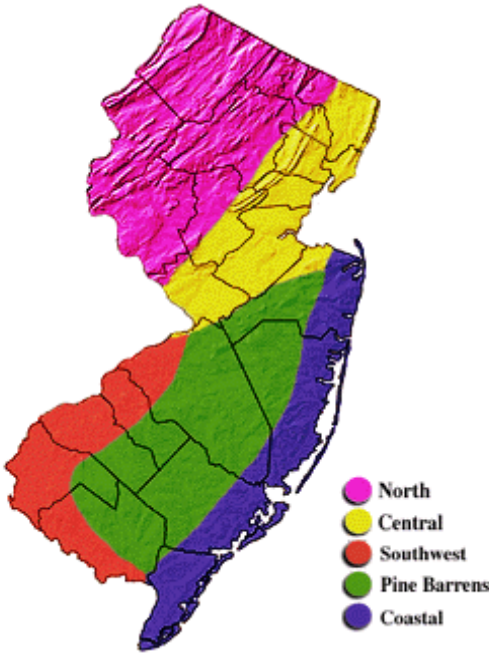
Chapter 4:

Climate

Climate is a measure of long-term weather patterns and variables such as temperature, precipitation, humidity, dew point, atmospheric pressure, and wind. Geographically situated approximately midway between the North Pole and the Equator, New Jersey's climate is extremely variable. The state's temperate, continental climate is influenced by both hot and cold, and dry and humid airstreams. From May through September, New Jersey is dominated by moist, tropical air that originates in the Gulf of Mexico and is swept in by prevailing winds from the southwest. In winter, winds generally prevail from the northwest, bringing cold, polar air masses from subarctic Canada.

New Jersey is divided into five climatic regions: the Northern, Central, Southwest, Pine Barrens and Coastal climate zones. Chesterfield lies along the western edge of the Pine Barrens Climate Zone, and just a few miles to the west of where the Central and Southwest Climate Zones meet. Accordingly, Chesterfield shares characteristics of all three climate zones.

Figure 6: New Jersey Climate Zones



Source: Rutgers University, 1983

Pine Barrens Climate Zone

Much of the Pine Barrens Climate Zone is dominated by scrub pine and oak forests, hence the name, and sandy soils, which are porous and not very fertile. By allowing precipitation to rapidly infiltrate, the sandy soils of the Pine Barrens zone promote dry surface conditions. These dry conditions allow solar radiation absorbed during the day to quickly radiate back into space at night, thereby contributing to a wider range between daily maximum and minimum temperatures. These conditions also make the area more vulnerable to forest fires.

Central Climate Zone

The southern edge of the Central Climate Zone runs from New York Harbor to the great bend in the Delaware River near Trenton. There is a significant temperature difference between the northern and southern portions of this zone, and areas to the south tend to have 30-40 days with temperatures above 90 degrees Fahrenheit, as opposed to 15-20 observed farther north.

Southwest Climate Zone

The Southwest Climate Zone has the highest average daily temperatures in the state and, lacking sandy soils, tends to have higher nighttime temperatures than in the neighboring Pine Barrens. This region receives less precipitation than the Northern and Central Climate Zones as there are no orographic features and it is farther away from the Great Lakes-St. Lawrence storm track. It also receives less precipitation than the Coastal Zone, as it is far enough inland to miss some of the heavier rains associated with coastal storms.

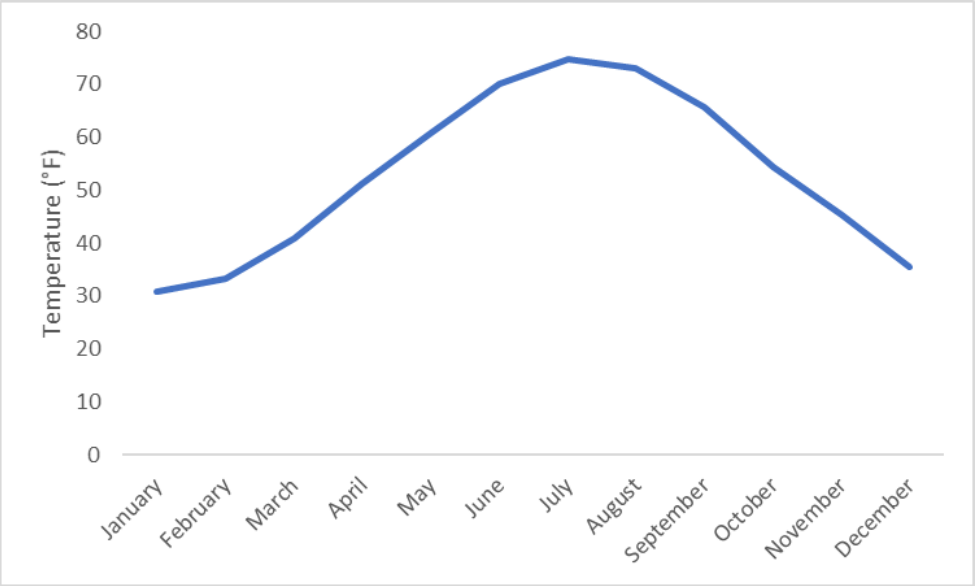
Climate Observations

Several weather and climate observation stations are located near Chesterfield. The National Centers for Environmental Information (NCEI), formerly the National Climate Data Center (NCDC), of the National Oceanic and Atmospheric Administration (NOAA) publishes climate data for the stations adjacent to Chesterfield on the NCEI website. The station at Hightstown, ten miles north of the township, has the most consistent nearby weather records. To describe climate averages the NCEI uses a 30-year data period. These thirty-year data intervals are known as “U.S. Climate Normals” and are updated at ten-year intervals. The most recent set of climate normals for the Hightstown station are for the 1991 to 2020 period.

Temperature

Based on data recorded at the Hightstown weather station from 1991 to 2020, the mean annual temperature is 52.8°F. Shown in the Monthly Temperatures (1991-2020) graph below, the coldest month is January with an average temperature of 31.0°F and the warmest month is July with an average of 74.9°F. The warmest average high temperatures also occur in July with an 86.7° average, while the coldest daily minimums occur in January with a 21.4° average.

Figure 7: **Mean Monthly Temperatures (1991-2020)**

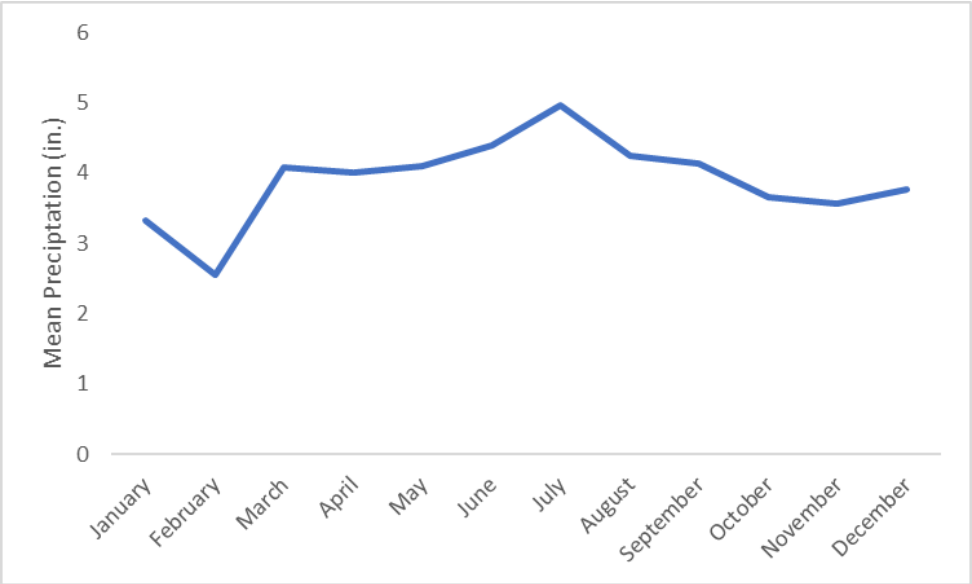


Source: NCEI, 2023

Precipitation

Also based on data recorded at Hightstown from 1991 to 2020, the area received an average of 47.5 inches of precipitation annually. The least amount of precipitation occurred in February with an average of 2.61 inches, and the most occurred in July with an average of 4.82 inches of precipitation.

Figure 8: **Mean Monthly Precipitation (1991-2020)**

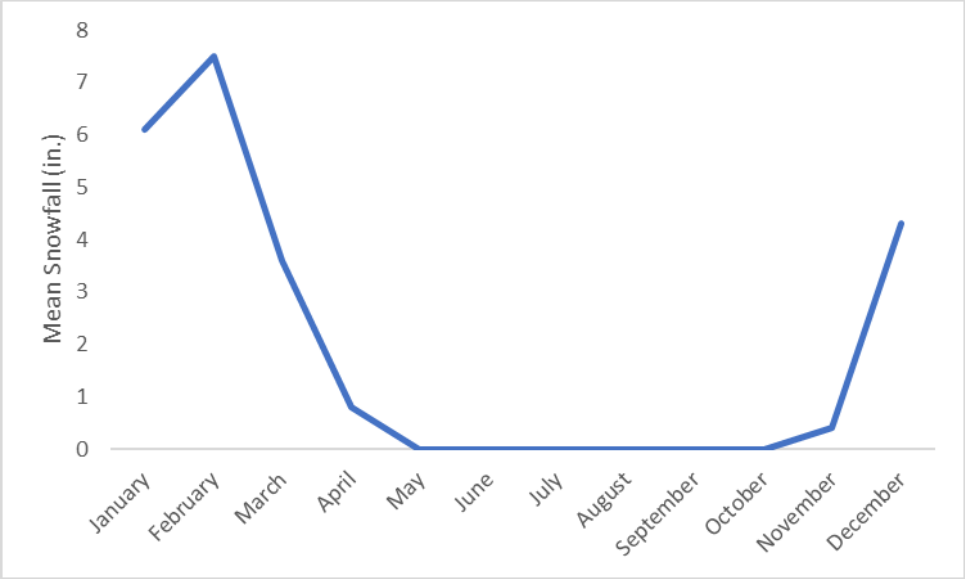


Source: NCEI, 2023

Snowfall

Snowfall generally occurs in Chesterfield from late November through early April, although the average snowfall in November and April is less than an inch. From 1991-2020, the heaviest snowfall occurred in January and February, which averaged 5.8 inches and 8.0 inches respectively.

Figure 9: **Mean Monthly Snowfall (1981-2010)**



Source: NCEI, 2023

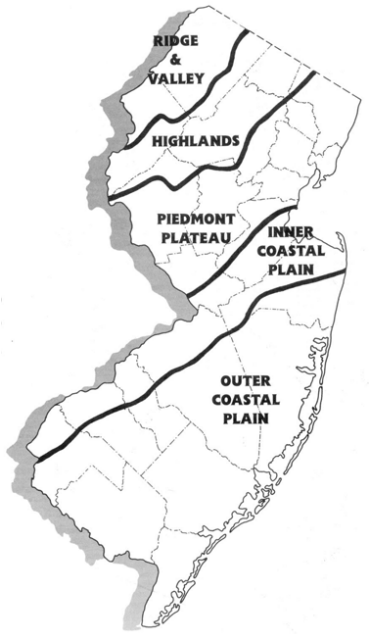
Chapter 5:

Physiography and Geology

Geology, along with soil and water resources, are physical resources: the nonliving features that residents of Chesterfield rely on for a stable built environment and sustenance.

Physiography is the study of a location in relation to its underlying geology. New Jersey is characterized by four physiographic provinces. Shown in **Figure 10**, these provinces include the Valley and Ridge Province, the Highlands Province, the Piedmont Plateau Province, and the Coastal Plain Province. The Coastal Plain Province is often further subdivided into the Inner Coastal Plain and the Outer Coastal Plain. The terrain of the four provinces is very diverse, with the rocky terrain of the northern provinces at one extreme and the sands of the coast at the other.

Figure 10: New Jersey's Physiographic Provinces



Source: NJGS, 2003

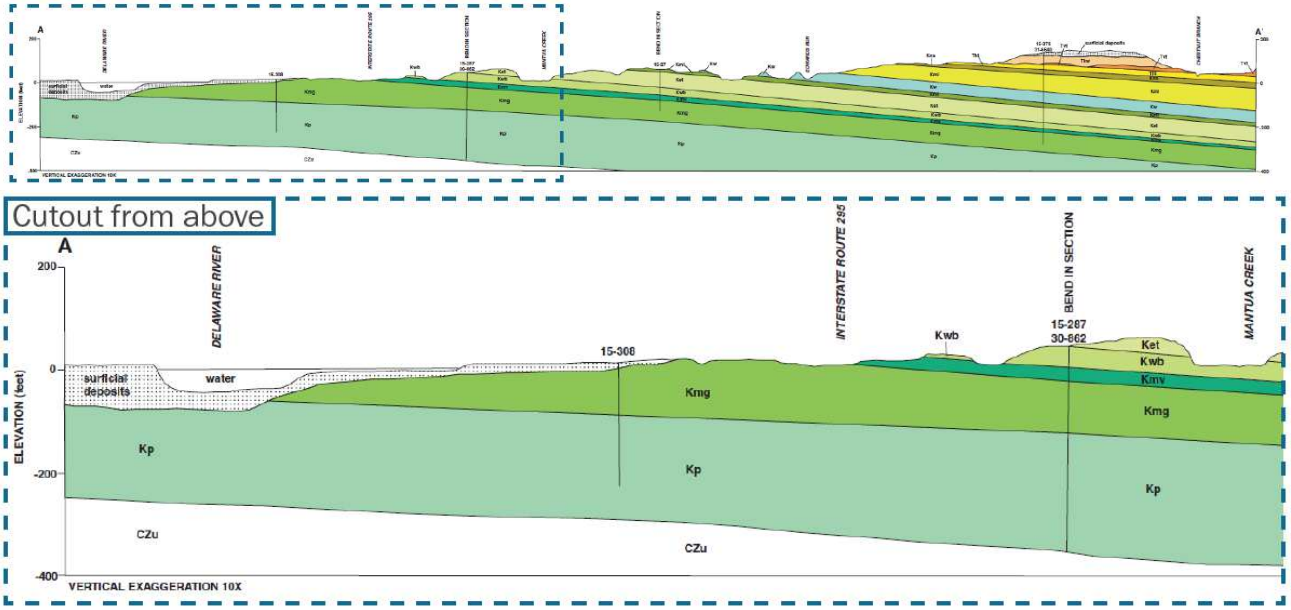
Chesterfield is located in the Inner Coastal Plain Province. In New Jersey, the Inner Coastal Plain is made up of interbedded sand and clay. Deposits originating in the breakdown of Appalachian and Catskill sedimentary, metamorphic, and igneous rocks are interbedded with layers formed by oceanic (marine) deposition, which occurred as the ocean shoreline advanced and receded over geologic time. The Inner Plain layers date from the late Cretaceous Period (Campanian) to the middle Miocene Period (Serravallian), 90 to 10 million years ago. Generally, soils of the Inner Coastal Plain are quite fertile, and the topography of the area is mostly flat and low lying.

Geologic Formations

Chesterfield contains nine underlying geologic formations that run southwest to northeast and extend beyond the borders of the township. Of these nine, Chesterfield is largely dominated by the Woodbury, Englishtown and Wenonah formations; the other six are minor players (see **Figure 12: Bedrock Geology** on page 26). A cross-section of the formations within the Woodbury Quadrangle, an area demarcated by the U.S. Geological Survey (USGS) within Burlington County, and which includes part of Chesterfield, is shown in **Figure 11**. The section illustrated in **Figure 11** is not "cut" directly through Chesterfield, but the formations and the way in which they are layered would be similar underneath the township.

The geology underneath the township is also described in **Table 4: Geologic Formations in Chesterfield**, where the geologic formations are organized from the most recently formed (top of table) to the oldest (bottom of table). Aquifers containing groundwater that support the region's industries, businesses, and residents are located between these geological formations and are discussed in the Groundwater section.

Figure 11: Cross Section of the Woodbury Quadrangle



Source: New Jersey Geological Survey OFM 59, 2004

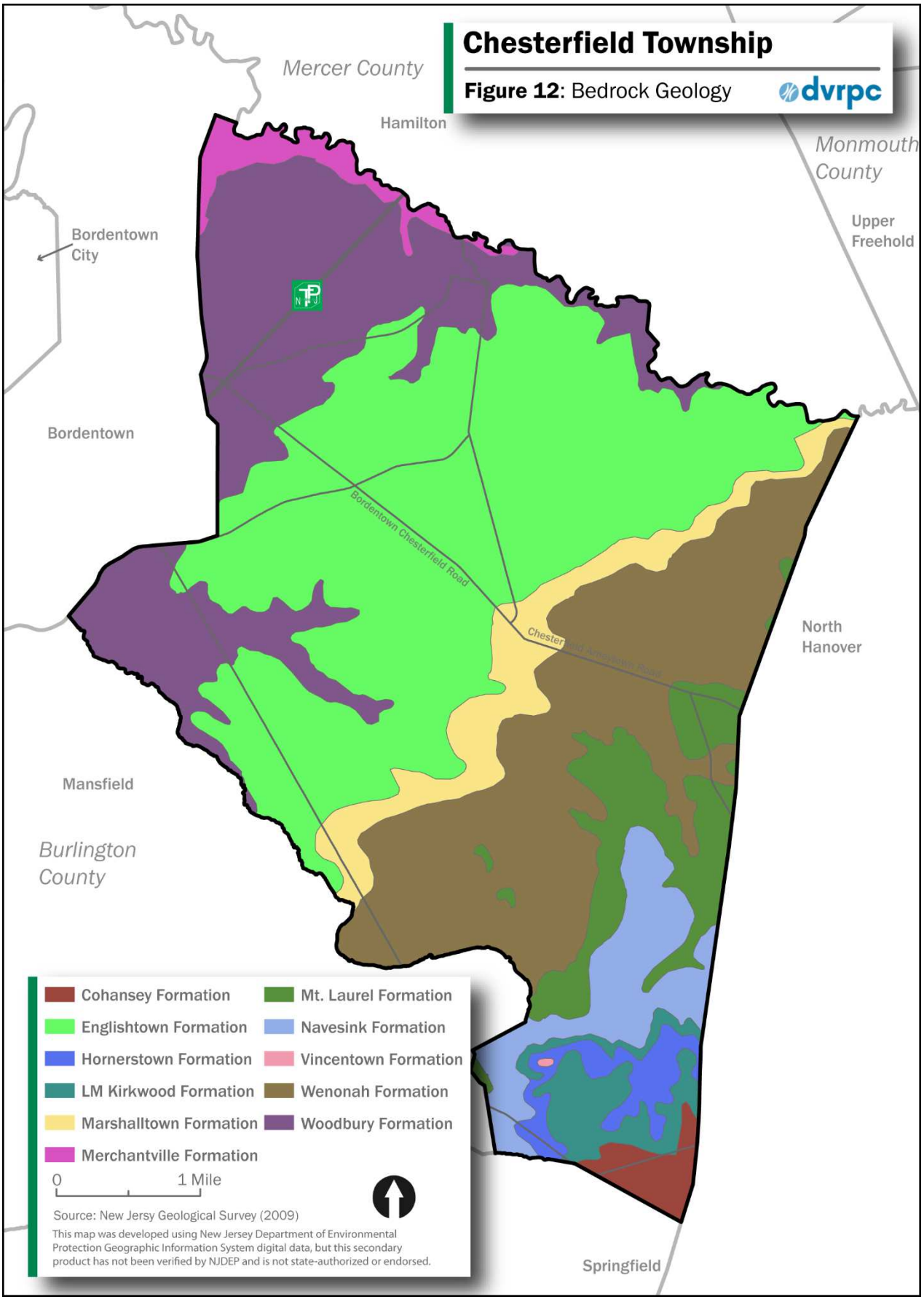

Chesterfield Township
Figure 12: Bedrock Geology
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
Bordentown Chesterfield Road
North Hanover
Mansfield
Burlington County
Springfield
Cohansey Formation
Englishtown Formation
Hornerstown Formation
LM Kirkwood Formation
Marshalltown Formation
Merchantville Formation
Mt. Laurel Formation
Navesink Formation
Vincentown Formation
Wenonah Formation
Woodbury Formation
0
1 Mile
Source: New Jersy Geological Survey (2009)
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.

Table 4: Geologic Formations in Chesterfield

Geologic Name	Abbreviation	Physiographic Province	Lithology	Geologic Age
Cohansey Formation	Tch	Coastal Plain	Quartz sand, medium- to coarse grained	Middle Miocene: Serravallian
Lower Member of Kirkwood Formation	Tkl	Coastal Plain	Quartz sand and clay	Lower Miocene: Burdigalian and Aquitanian
Vincentown Formation	Tvt	Coastal Plain	Quartz sand, medium-grained, clayey; and glauconitic near base; locally a calcarenite or coquina	Upper Paleocene: Selandian
Englishtown Formation	Ket	Coastal Plain	Quartz sand, fine- to coarse-grained, locally interbedded with thin- to thick beds of clay	Late Cretaceous: Campanian
Merchantville Formation	Kmv	Coastal Plain	Glauconite sand to quartz-glauconite sand, clayey and silty	Late Cretaceous: Campanian
Mount Laurel Formation	Kml	Coastal Plain	Quartz sand, fine-grained, silty, clayey micaceous	Late Cretaceous: Campanian
Woodbury Formation	Kwb	Coastal Plain	Clay-silt	Late Cretaceous: Campanian
Wenonah Formation	Kw	Coastal Plain	Quartz sand, fine- to medium-grained	Late Cretaceous: Campanian
Marshalltown Formation	Kmt	Coastal Plain	Quartz and glauconite sand, silty and clayey	Late Cretaceous: Campanian

Source: New Jersey Geological Survey (NJGS), 2009 Soils

Chapter 6:

Topography

Topography relates to the surface terrain and features of an area. Chesterfield is characterized by rolling hills with low-lying areas and valleys carved out by streams, as well as higher elevations scattered in the northwest and southeast corners of the township. The areas of highest elevation, around 125 feet above sea level, are in the southeast corner along and near Monmouth Road. The areas of lowest elevation are on the township's northeast boundary along Crosswicks Creek, as well as in the southwest corner along Blacks Creek. These areas are roughly at sea level. The township's topography is shown in **Figure 13**.

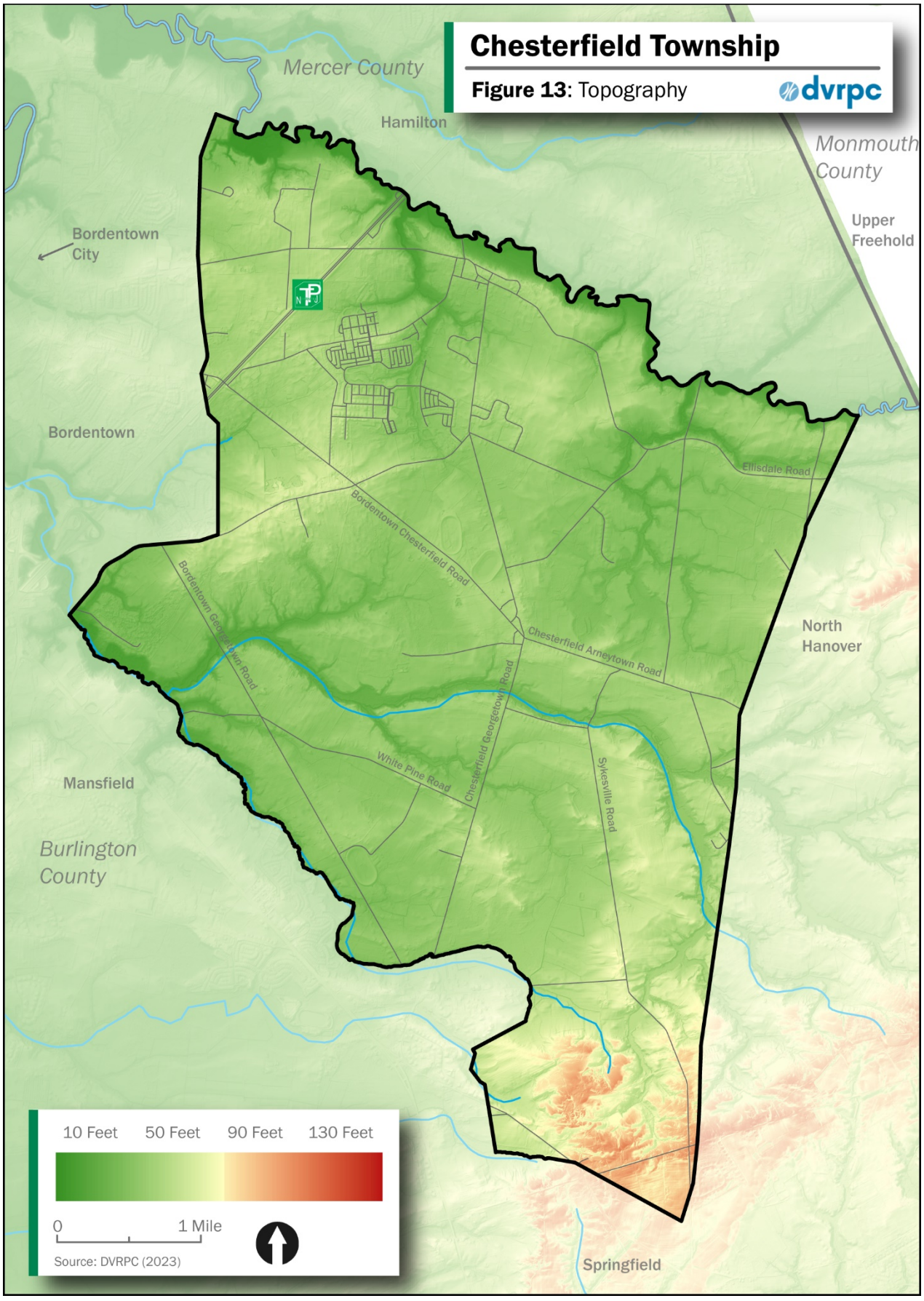
Steep Slopes

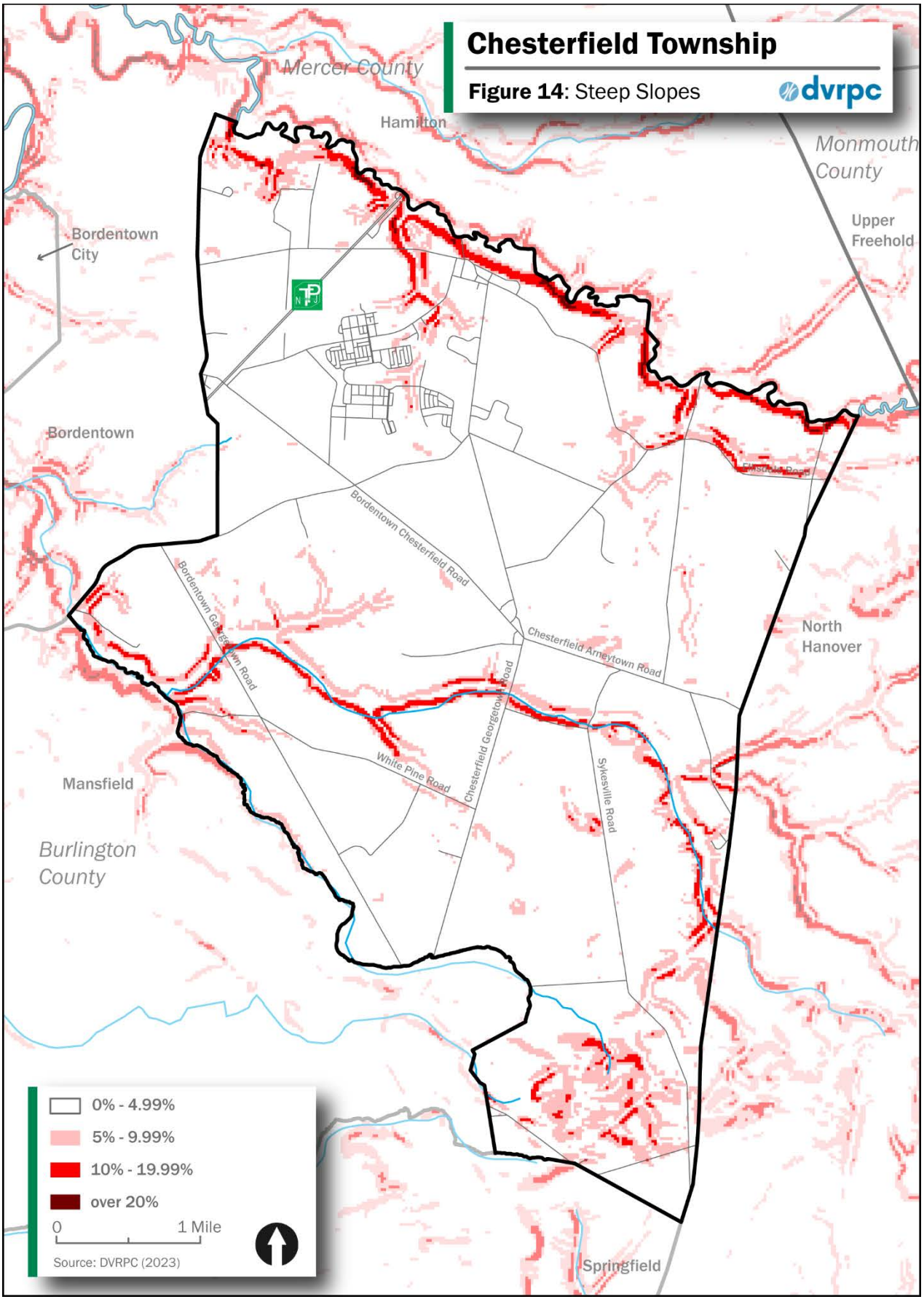
Steep slopes are fragile environmental features, and development of steep slope areas is inadvisable because it can result in soil instability, erosion, increased stormwater runoff, flooding, and sedimentation of the stream below. These effects in turn result in degradation of water quality, habitat destruction, and potential damage to property.

In this ERI, slope is measured by the ratio of vertical rise to horizontal distance (also known as "run". Generally, slopes under 10 percent are not subject to any development constraints in most communities.

Most of the land within Chesterfield is less than 5 percent in slope (**Figure 14: Steep Slopes**). Small areas with slopes of 10 to 20 percent are present primarily along Blacks and Crosswicks creeks, where the water has eroded soil over time. Extremely limited areas of slopes over 20 percent are found primarily along Crosswicks Creek in the north of the township.

The township's zoning ordinance labels slopes with gradients exceeding 15 percent as Environmentally Sensitive Areas and requires additional mapping and regulatory review for development on these areas. These rules are designed to protect ecosystem services for the community while avoiding environmental degradation such as soil erosion and subsequent sedimentation of streams. Even if regulatory constraints did not exist, construction in steep slopes may result in higher up-front costs to builders in order to construct sufficiently resilient buildings or infrastructure. If development does not adequately account for the physical constraints that exist on a parcel, it may cause damage to the property over time, particularly in the form of foundation or septic system failure.


Chesterfield Township
Figure 13: Topography
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
10 Feet
50 Feet
90 Feet
130 Feet
0
1 Mile
Source: DVRPC (2023)


Chesterfield Township
Figure 14: Steep Slopes
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
North Hanover
Mansfield
Burlington County
Springfield
0% - 4.99%
5% - 9.99%
10% - 19.99%
over 20%
0
1 Mile
Source: DVRPC (2023)

Chapter 7:

Soils

Soil is the foundation for all land uses. Soil types vary in their physical, chemical, and biological properties, influencing the vegetation and development potential of a region. To cite one example, soil properties affect the location of wells and septic facilities, which impacts the types and intensities of development suitable for certain areas. Soil is a natural resource that cannot be replenished on the human time scale.

Data on soil types derives from surveys conducted by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). The Soil Testing Laboratory at the Rutgers New Jersey Agricultural Experiment Station tests soil properties for residents throughout New Jersey.

Septic Suitability

Soil type is a major determining factor in planning for the location of septic systems. A variety of negative impacts can occur if a septic system is constructed in soils with low infiltration rates or high-water tables. These impacts may include contamination of groundwater, potentially leading to contamination of drinking water and pollution of nearby surface water; foul odors from unfiltered effluent; toilet and septic system failure; and high costs to property owners from installing and maintaining home disposal systems.

Agricultural Soils

Chesterfield's Master Plan notes the importance of the agriculture industry to the township and sets preservation of agricultural land as the plan's primary goal. Fertile soils in the township supported the historical development of Chesterfield as an agricultural community and continue to underpin its agricultural character to this day.

About 85 percent of Chesterfield's soils are good for agriculture because of their slope, drainage rates, saturation, chemical makeup, and other qualities. Almost 71 percent of Chesterfield's land area is classified as Prime Farmland. These soils have the best combination of physical and chemical characteristics for producing high yields of crops. They do not substantially erode, are not saturated with water for long periods of time, and do not flood frequently. The dominance of prime farmland in Chesterfield's soil is a driving factor of the township's predominantly agricultural character.

More than 9 percent of soils in Chesterfield are classified as Farmland of Statewide Importance and are slightly less conducive to crop production than Prime Farmland. However, they may still sustain high yields, sometimes matching those grown in Prime Farmland soil, when managed well and under favorable environmental conditions. In New Jersey, Farmland of Statewide Importance includes soils that do not meet Prime Farmland criteria and that have a Soil Capability Class of 2 (i.e. the soil has moderate limitations that restrict the choice of plants and/or that require special conservation practices) or 3 (i.e. the soil has severe limitations that restrict the choice of plants and/or that require very careful management).

A further 3.84 percent of Chesterfield's soils are classified as Farmland of Statewide Importance*, if drained*. These soils have the potential to be highly productive agricultural land, though as the name implies, they require drainage to achieve full productivity.

Just 0.14 percent of Chesterfield's soils fit under the category of Farmland of Unique Importance. While these soil types do not share the conventional characteristics of prime soil, they have some combination of temperature, humidity, drainage, elevation, aspect, or locational characteristics that allow for successful growth and sale of a specialty crop, such as blueberries or cranberries.

One percent of soils in Chesterfield are classified as Farmland of Local importance. These soils are locally important for crop production, but are not categorized as Prime Farmland, Farmland of Unique Importance, or Farmland of Statewide Importance.

The remaining 15 percent of soils in Chesterfield are classified as Other Soils and are not considered suitable for farming. They are typically highly saturated, have steep slopes, have been urbanized or otherwise disturbed, or do not have a chemical makeup that would facilitate the growth of crops. The distribution of agricultural soils in Chesterfield is listed in **Table 5** and mapped in **Figure 16**.

Table 5: Area by Farmland Classification

Soil Classification	Acres	Percent of Township
Prime farmland	9,706.29	70.70%
Farmland of statewide importance	1,264.64	9.21%
Farmland of statewide importance, if drained	527.98	3.84%
Farmland of unique importance	19.74	0.14%
Farmland of local importance	137.48	1.00%
Not prime farmland	2,059.91	15.01%
Total	**13,728.04**	**100%**

Source: NRCS, 2010

Hydric Soils

Hydric soils, as defined by the National Technical Committee of Hydric Soils, are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in their subsurface. Hydric soils have unique soil properties that distinguish them from nonhydric soils. They support the development of hydrophytic vegetation, and are an important element of wetland areas. If a soil is classified as "hydric," land use may be restricted due to the relationship of hydric soils to wetlands and wetland preservation.

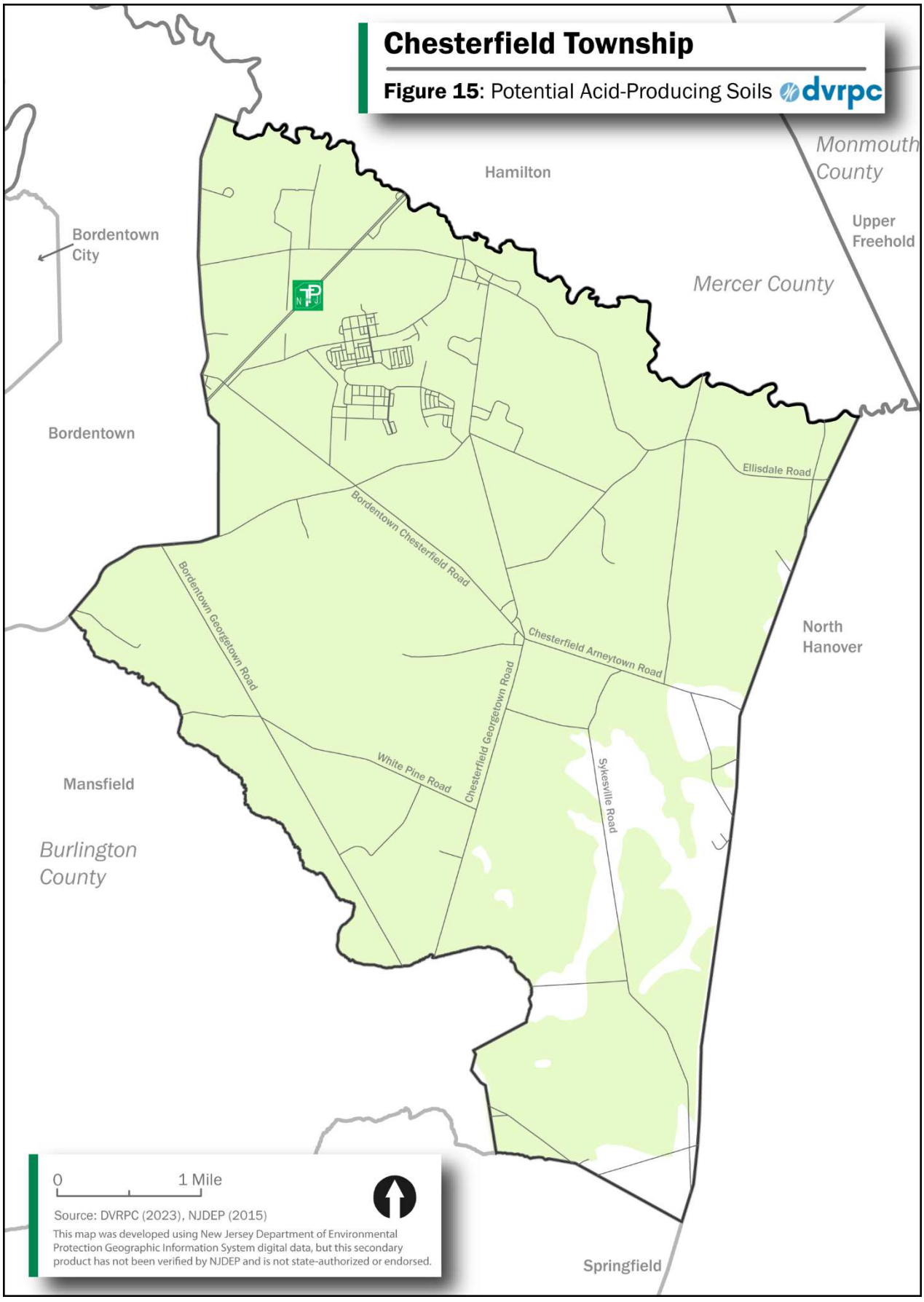
The degree to which a soil may be "hydric" can vary dramatically. Soil mapping is an imprecise science, and often, a mixture of soil types may be present within a given area, which is nonetheless mapped as a single "soil" type. For example, many hydric soils are actually interspersed as small pockets within larger nonhydric soils formations, that will be mapped as the dominant soil type. Consequently, any sort of site development requires a measure of fieldwork beyond countywide soil surveys.

Approximately 60.2 percent of Chesterfield's soils are hydric soils. Approximately 75 percent of Chesterfield's hydric soils are rated as prime farmland. An additional 8 percent are classified as soils of either local or statewide importance, if drained, and the remaining 17 percent are not rated for agricultural use.

Potential Acid-Producing Soils

Figure 15 depicts areas within Chesterfield where NJDEP has identified potential acid-producing soils. These potential acid-producing soils cover most of the township. NJDEP classifies all soils developed on sedimentary units with the potential to produce acid soils as potential acid-producing soils; not all soils within the highlighted area are necessarily acid producing. High acid-producing soils may be present in undisturbed soils at varying depths, including near the soil surface to excavations or deep disturbances. Its presence on a site may be significant or limited in the soil profile.

High-acid producing soil may be exposed during excavation and land grading activities, or may be introduced in dredged sediment. When these soils and sediment are exposed to air, they produce sulfuric acid and result in soil pH levels falling to 4.0 and lower. Most vegetation is incapable of growth at this pH level. Adjacent land and receiving waters will be negatively impacted by the acid leachate. Calcium-containing materials such as sidewalks, culverts, and other structures and some metallic materials are also susceptible to destruction. Early recognition and burial, removal, or dispersal of high acid-producing soils is essential for limiting the amount of acidic material produced. For more information on the management of high acid-producing soils, see the relevant section of New Jersey's Standards for Soil Erosion and Sediment Control at https://www.nj.gov/agriculture/divisions/anr/pdf/1_Acid%20Soil%202011.pdf.


Chesterfield Township
Figure 15: Potential Acid-Producing Soils
dvrpc
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Mercer County
Bordentown
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
North Hanover
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
Mansfield
Burlington County
Springfield
0
1 Mile
Source: DVRPC (2023), NJDEP (2015)
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.

Soil Types

Chesterfield contains 21 soil series identified by the Soil Conservation Service. These are shown in **Table 6**. The most common are Adelphia, Collington, Freehold, Holmdel, Keyport, and Sassafras. Together, these six soil series comprise 76 percent of the total area of the township. They are briefly described below.

Adelphia Series

Adelphia soils are fine-loamy soils that are moderately well drained to somewhat poorly drained, though they are moderately well drained in most places in Burlington County. They are nearly level or gently sloping. These soils have moderately slow to moderate permeability and have moderately high to high water capacity. Organic-matter content is moderate, and natural fertility is moderately high. Adelphia soils are very strongly acidic, except where limed.

The native vegetation on Adelphia soils is a hardwood forest that consists mostly of red oak, white oak, scarlet oak, black oak, hickory, beech, ash, yellow-poplar, and sweetgum. However, 80-90 percent of the acreage of Adelphia soils has been cleared for crops. The crops grown on Adelphia soils include small grains, corn, soybeans, and hay, which are general crops, and tomatoes, potatoes, fruit, nursery stock, and sod, which are high-value crops. Adelphia soils are the second most common soil series in the township, consisting of 2,548 acres, or 18.58 percent of the township's area.

Collington Series

Collington soils are well drained, loamy soils that occur in high positions and have slopes of up to 10 percent. These soils have a high available water capacity and moderate organic-matter content. Permeability is moderately slow to moderate, and the soils are moderately high in fertility. Except where limed, these soils are very strongly acidic.

The native vegetation on these soils is a hardwood forest consisting of red oak, yellow-poplar, hickory, ash, and beech, as well as an understory of viburnums. Most of the acreage of Collington soils has been cleared for crops, including fruits, vegetables, corn, small grains, soybeans, hay, pasture, and potatoes. Collington soils are the most common soil series in the township, consisting of 2,644.89 acres, just under one-fifth of the township's area.

Freehold Series

Freehold soils are well-drained, sandy and loamy soils that have a high or moderately high available water capacity. They typically occur on nearly level or gently sloping ground, but they can less commonly range to steep. They are moderately to moderately slowly permeable. Fertility is moderate or moderately high, and organic-matter content ranges from moderate in the fine sandy loams to low in the loamy sands. These soils are very strongly acidic except where limed.

The native vegetation on these soils is a fast-growing forest of red oak, white oak, scarlet oak, yellow-poplar, beech, and hickory. Freehold soils are well suited to crops and are the most extensively farmed soils in Burlington County. They are well suited to fruit, vegetables, grain, hay, pasture, nursery plants, and cultivated sod. Freehold soils are the third most common soil series in Chesterfield, with 1,957.54 acres, 14.26 percent of the township.

Field of Row Crops | Source: Miles Owen

Holmdel Series

Holmdel soils are moderately well drained or somewhat poorly drained loamy and sandy soils. They are moderately slow in permeability, and have a moderately high or high available water capacity. Fertility is moderate or moderately high. Except where they have been limed heavily, these soils are strongly acidic.

The native vegetation is a forest consisting mostly of red oak, white oak, scarlet oak, yellow-poplar, beech, and hickory. Most areas have been cleared for crops, including corn, soybeans, small grains, hay, pasture, fruit, vegetables, and nursery plants in well drained areas. In most places, farmed Holmdel soils have been drained by open ditches or underdrains. There are 1,031.39 acres of Holmdel soils in Chesterfield, 7.51 percent of the township.

Keyport Series

Keyport soils are moderately well drained, brownish soils, which are most commonly nearly level to gently sloping soils, though slopes are as much as 25 percent in some places. They are moderate in organic-matter content and in fertility, and are slowly permeable, with a high available water capacity. Except where lime has been added in large amounts, these soils are very strongly acidic.

The native vegetation is a hardwood forest consisting of yellow-poplar, red oak, white oak, ash, beech, and hickory. In most places they have been cleared for crops, including small grains, corn, soybeans, hay, pasture, and tomatoes. Drainage is generally not good enough for fruit. Keyport soils make up 967.31 acres (7.05 percent) of Chesterfield's area.

Sassafras Series

Sassafras soils are well drained, moderately coarse textured soils. These soils are mostly nearly level or gently sloping, though they have slopes of 5 to 10 percent in some places. Sassafras soils are moderately permeable. The available water capacity, organic-matter content, and fertility are moderate except where the surface layer is loamy sand. Sassafras soils are very strongly acidic unless heavily limed.

The native vegetation is a hardwood forest consisting mostly of red oak, white oak, black oak, scarlet oak, hickory, beech, yellow-poplar, and scattered Virginia pine. They are easily worked and respond well to fertilization. In the Inner Coastal Plain, nearly all Sassafras soils have been cleared for farming. High-value vegetables were grown under irrigation, but now much of this formerly irrigated area has been developed for residential, commercial, and industrial uses. Chesterfield has 1,278.06 acres of Sassafras soil, 9.31 percent of the township's area.

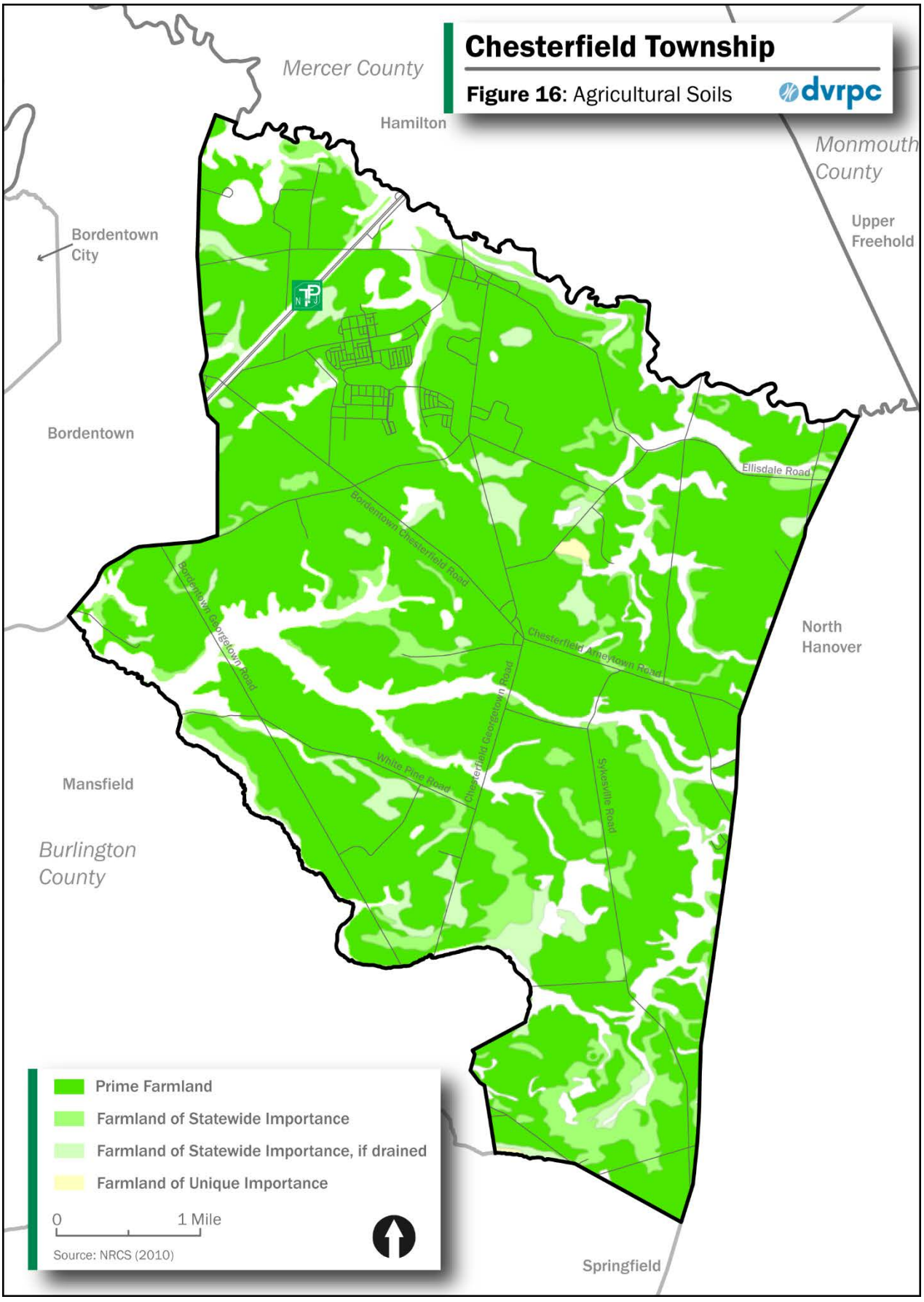
Table 6: Soil Types and Acreage in Chesterfield

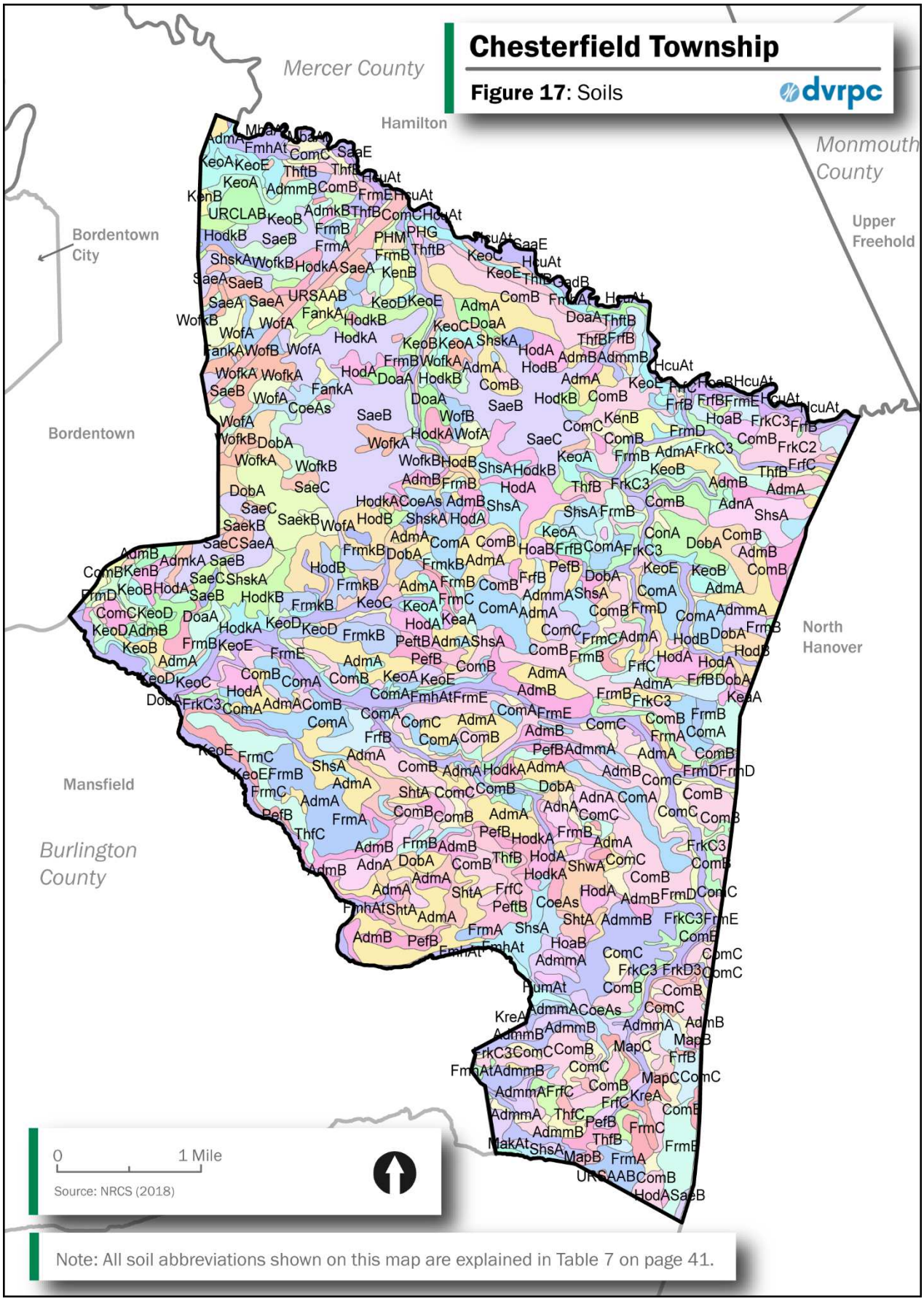
Soil types	Acres	Percentage
Adelphia	**2,548.04**	**18.56%**
Colemantown	128.04	0.93%
Collington	**2,644.89**	**19.27%**
Donlonton	364.21	2.65%
Fallsington	54.02	0.39%
Fluvaquents	889.4	6.48%
Freehold	**1,957.54**	**14.26%**
Galestown	0.89	0.01%
Galloway	0.08	0.00%
Holmdel	**1,031.39**	**7.51%**
Humaquepts	23.71	0.17%
Keansburg	9.44	0.07%
Keyport	**967.31**	**7.05%**
Kresson	26.16	0.19%
Manahawkin	18.85	0.14%
Marlton	53.71	0.39%
Pemberton	178.37	1.30%
Sassafras	**1,278.06**	**9.31%**

Soil types	Acres	Percentage
Shrewsbury	511.72	3.73%
Tinton	272.59	1.99%
Woodstown	476.72	3.47%

Source: NRCS, 2018

All the soil series and their phases (subtypes) are listed in **Table 7: Soils** and are mapped in **Figure 17** on page 40. **Table 7: Soils** provides information on all soils in Chesterfield including their suitability for agriculture ("Soil Capability Class") and for development ("Development Capability"). These "suitability" classifications were developed by the United States Department of Agriculture (USDA) to determine the best agricultural use of lands by classifying and mapping erosion rates and potential in relation to both physical characteristics and agricultural capacity. The number in the Soil Capability Class indicates how limited the soil is for agricultural purposes, and the letter indicates the specific reason(s) for limitations.


Chesterfield Township
Figure 16: Agricultural Soils
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
Prime Farmland
Farmland of Statewide Importance
Farmland of Statewide Importance, if drained
Farmland of Unique Importance
0
1 Mile
Source: NRCS (2010)



Note: All soil abbreviations shown on this map are explained in Table 7 on page 41.

Table 7: Soils

Soil Code	Soil Name (Phase)	Acres	Soil Capability Class	Development Capability		
				Building without Basement	Building with Basement	Small Commercial
AdmA	Adelphia fine sandy loam, 0 to 2 percent slopes	1,188.73	2w	B	C	B
AdmB	Adelphia fine sandy loam, 2 to 5 percent slopes	435.75	2w	B	C	B
AdmkA	Adelphia fine sandy loam, clayey substratum, 0 to 2 percent slopes	40.32	2w	B	C	B
AdmkB	Adelphia fine sandy loam, clayey substratum, 2 to 5 percent slopes	26.06	2w	B	C	B
AdmmA	Adelphia high glauconite variant fine sandy loam, 0 to 2 percent slopes	278.79	2w	B	C	B
AdmmB	Adelphia high glauconite variant fine sandy loam, 2 to 5 percent slopes	333.97	2w	B	C	B
AdnA	Adelphia loam, 0 to 2 percent slopes	244.42	2w	B	C	B
CoeAs	Colemantown loam, 0 to 2 percent slopes, occasionally flooded	128.04	3w	C	C	C
ComA	Collington fine sandy loam, 0 to 2 percent slopes	547.92	1	B	A	B
ComB	Collington fine sandy loam, 2 to 5 percent slopes	1,613.21	2e	A	A	B
ComC	Collington fine sandy loam, 5 to 10 percent slopes	381.05	3e	A	A	C
ConA	Collington loam, 0 to 2 percent slopes	102.71	1	B	A	B
DoaA	Donlonton fine sandy loam, 0 to 2 percent slopes	107.25	2w	B	C	B
DobA	Donlonton loam, 0 to 2 percent slopes	256.96	2w	B	C	B
FanA	Fallsington fine sandy loam, 0 to 2 percent slopes	3.61	3w	C	C	C
FankA	Fallsington fine sandy loam, clayey substratum, 0 to 2 percent slopes	50.41	3w	C	C	C
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	889.40	5w	C	C	C
FrfB	Freehold loamy sand, 0 to 5 percent slopes	269.75	2s	A	A	A
FrfC	Freehold loamy sand, 5 to 10 percent slopes	82.40	3e	A	A	B

Soil Code	Soil Name (Phase)	Acres	Soil Capability Class	Development Capability		
				Building without Basement	Building with Basement	Small Commercial
FrkC2	Freehold sandy loam, 5 to 10 percent slopes, eroded	5.60	3e	A	A	C
FrkC3	Freehold sandy loam, 5 to 10 percent slopes, severely eroded	195.40	4e	A	A	C
FrkD3	Freehold sandy loam, 10 to 15 percent slopes, severely eroded	21.88	6e	B	B	C
FrmA	Freehold fine sandy loam, 0 to 2 percent slopes	264.13	1	C	C	C
FrmB	Freehold fine sandy loam, 2 to 5 percent slopes	563.23	2e	C	C	B
FrmC	Freehold fine sandy loam, 5 to 10 percent slopes	115.53	3e	A	A	C
FrmD	Freehold fine sandy loam, 10 to 15 percent slopes	128.23	4e	B	B	C
FrmE	Freehold fine sandy loam, 15 to 25 percent slopes	152.20	6e	C	C	C
FrmkB	Freehold fine sandy loam, clayey substratum, 2 to 5 percent slopes	159.19	2e	A	A	B
GadB	Galestown loamy sand, 0 to 5 percent slopes	0.89	3s	A	A	A
GASB	Galloway variant soils, 0 to 5 percent slopes	0.08	3w	A	C	A
HcuAt	Hatboro-Codorus complex, 0 to 3 percent slopes, frequently flooded	9.06	5w	C	C	C
HoaB	Holmdel loamy sand, 0 to 5 percent slopes	77.59	2w	B	C	B
HodA	Holmdel fine sandy loam, 0 to 2 percent slopes	370.59	2w	B	C	B
HodB	Holmdel fine sandy loam, 2 to 5 percent slopes	177.32	2w	B	C	B
HodkA	Holmdel fine sandy loam, clayey substratum, 0 to 2 percent slopes	144.04	2w	B	C	B
HodkB	Holmdel fine sandy loam, clayey substratum, 2 to 5 percent slopes	261.85	2w	B	C	B
HumAt	Humaquepts, 0 to 3 percent slopes, frequently flooded	23.71	5w	C	C	C
KeaA	Keansburg fine sandy loam, 0 to 2 percent slopes	9.44	3w	C	C	C

Soil Code	Soil Name (Phase)	Acres	Soil Capability Class	Development Capability		
				Building without Basement	Building with Basement	Small Commercial
KenB	Keyport fine sandy loam, 2 to 5 percent slopes	81.23	2e	B	C	B
KeoA	Keyport loam, 0 to 2 percent slopes	178.32	2w	B	C	B
KeoB	Keyport loam, 2 to 5 percent slopes	182.21	2e	B	C	B
KeoC	Keyport loam, 5 to 10 percent slopes	130.15	3e	B	C	C
KeoD	Keyport loam, 10 to 15 percent slopes	145.27	4e	B	C	C
KeoE	Keyport loam, 15 to 25 percent slopes	250.13	6e	C	C	C
KrbA	Kresson loamy sand, 0 to 5 percent slopes	1.16	3w	C	C	C
KreA	Kresson fine sandy loam, 0 to 2 percent slopes	26.16	3w	C	C	C
MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	18.85	7w	C	C	C
MapB	Marlton fine sandy loam, 2 to 5 percent slopes	12.09	2e	B	B	B
MapC	Marlton fine sandy loam, 5 to 10 percent slopes	41.62	3e	B	B	C
MbaAt	Marsh, fresh water, 0 to 2 percent slopes, frequently flooded	2.15	N/A	Not rated	Not rated	Not rated
PefB	Pemberton sand, 0 to 5 percent slopes	109.30	3w	A	C	A
PeftB	Pemberton sand, thick surface, 0 to 5 percent slopes	69.07	3w	C	A	C
PHG	Pits, sand and gravel	15.31		Not rated	Not rated	Not rated
PHM	Pits, clay	9.80	8s	C	C	C
SaaD	Sandy and silty land, strongly sloping	0.35	8s	B	B	C
SaaE	Sandy and silty land, steep	0.73	8s	C	C	C
SaeA	Sassafras fine sandy loam, 0 to 2 percent slopes	91.13	1	A	A	A
SaeB	Sassafras fine sandy loam, 2 to 5 percent slopes	1,054.96	2e	A	A	B

Soil Code	Soil Name (Phase)	Acres	Soil Capability Class	Development Capability		
				Building without Basement	Building with Basement	Small Commercial
SaeC	Sassafras fine sandy loam, 5 to 10 percent slopes	57.25	3e	A	A	C
SaekB	Sassafras fine sandy loam, clayey substratum, 2 to 5 percent slopes	165.85	2e	C	B	B
ShsA	Shrewsbury fine sandy loam, 0 to 2 percent slopes	251.37	3w	C	C	C
ShskA	Shrewsbury fine sandy loam, clayey substratum, 0 to 2 percent slopes	78.28	3w	C	C	C
ShtA	Shrewsbury loam, 0 to 2 percent slopes	116.99	3w	C	C	C
ShwA	Shrewsbury ironstone substratum variant fine sandy loam, 0 to 2 percent slopes	65.08	3w	C	C	C
ThfB	Tinton sand, 0 to 5 percent slopes	193.56	3s	A	A	A
ThfC	Tinton sand, 5 to 10 percent slopes	34.42	4s	A	A	C
ThftB	Tinton sand, thick surface, 0 to 5 percent slopes	44.61	3s	A	A	A
URCLAB	Urban land, clayey substratum, 0 to 8 percent slopes	46.78	8s	B	A	B
URSAAB	Urban land, sandy, 0 to 8 percent slopes	114.23	8s	A	A	A
WATER	Water	2.20	N/A	N/A	N/A	N/A
WofA	Woodstown fine sandy loam, 0 to 2 percent slopes	137.86	2w	A	B	A
WofB	Woodstown fine sandy loam, 2 to 5 percent slopes	61.24	2w	A	B	B
WofkA	Woodstown fine sandy loam, clayey substratum, 0 to 2 percent slopes	138.93	2w	A	C	A
WokB	Woodstown fine sandy loam, clayey substratum, 2 to 5 percent slopes	138.69	2w	A	C	B

Source: NRCS, 2018

Capability Class	
1	Slight limitations that restrict their use.
2	Moderate limitations that restrict the choice of plants or that require moderate conservation practices.
3	Severe limitations that restrict the choice of plants or require special conservation practices, or both.
4	Very severe limitations that restrict the choice of plants or require very careful management, or both.
5	Subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
6	Severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.
7	Very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.
8	Limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Source: NRCS, 2018

Capability Subclasses	
e	The main hazard is the risk of erosion unless close-growing plant cover is maintained.
w	Water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage).
s	Soil is limited mainly because it is shallow, droughty, or stony.
c	Chief limitation is climate that is very cold or very dry.

Source: NRCS, 2018

Key to Development Capability	
A = Not Limited	Little or no limitation(s) or easily corrected by use of normal equipment and design techniques.
B = Somewhat limited	Presence of some limitations, which normally can be overcome by careful design and management at somewhat greater cost.
C = Very limited	Limitations that normally cannot be overcome without exceptional, complex, or costly measures.
N/A	Limitations are not rated or listed.

Source: NRCS, 2018

Soil Erosion

Soil erosion is one of the most important environmental problems facing agricultural and developing communities alike. In the absence of human activity, *soil creation*, a process by which eroded rock material mixes with decomposed vegetation over time, happens at about the same rate as *soil erosion*, the process in which water and wind strip soil from the land. However, agriculture and development activities lead to soil erosion rates that far outpace the rate of soil creation. In the United States, the most significant effects are the loss of prime agricultural soils, increased flooding, and pollution of streams and rivers. Chesterfield's Stormwater Management Regulations stipulate minimum standards for erosion control as established under New Jersey's Soil and Sediment Control Act, N.J.S.A. 4:24-39 et seq. These regulations are intended to reduce erosion, stormwater runoff volume, and pollution by utilizing best management practices to manage stormwater runoff and maximize natural water infiltration both during and after construction activities. These best management practices address areas most susceptible to erosion, such as steep slopes. See **Appendix C** for considerations on developing a successful plan to control soil erosion on construction sites from the Standards for Soil Erosion and Sediment Control as outlined by the New Jersey Department of Agriculture.

Chapter 8:

Agricultural Land

Historically, Chesterfield has been a center for farming in New Jersey. With fertile soil, readily available water supply, and favorable weather, the first farms were started in the late 1600s and have been a primary economic and cultural foundation for the township ever since.

Because of this economic and cultural importance, farmland preservation in Chesterfield has been a high priority for several decades. In 1985, the Burlington County Board of Freeholders purchased five farms totaling just over 600 acres in the township for preservation purposes. These farms were the first ever preserved in the state and represent the start of farmland preservation programs in both Burlington County and the state.

Katona Farms | Source: Miles Owen

Chesterfield adopted a comprehensive master plan in 1997, which called for the Township to adopt a voluntary Transfer of Development Rights (TDR) program to preserve the township's agricultural character in the face of increasing development pressures in the region. TDR programs are a tool used for farmland preservation in which landowners in the designated sending area can sell the development rights of their land to developers, who can then use those rights to develop land in the receiving area. In Chesterfield, the program directs development to a single area in the northeast corner of the township, Old York Village, and preserves a large "sending area" (encompassing much of the rest of the township) for agriculture.

This TDR plan was amended in 2017 and has resulted in one of the most successful farmland preservation programs in the State of New Jersey. As of August 2021, the township had preserved 7,956 acres of farmland in the sending area and had largely built out the 560-acre receiving area. The development of Old York Village has included construction of housing units, the Chesterfield Elementary School, as well as shops and green space, including a conservation easement with wetlands designed to allow for aquifer recharge via stormwater infiltration. This concentrated development has resulted in the village having a compact and walkable design while including ample green space, with streets named after original Chesterfield farms to honor the community's history.

Farmers of preserved farms in Chesterfield are regularly honored for their outstanding conservation practices with the Burlington County Farm Stewardship Award. David and Doris Wilkinson, John Catalfamo, Jack Homa, and Roseann Greenberg have all won this award, which recognizes farmers who maintain their preserved farms as a productive, viable, and well-managed resource. This award is given in honor of Bill and Dorothy Pettit's exemplary commitment to farm stewardship and 25+ years of service to the Burlington County Agriculture Development Board.

Chapter 9:

Hydrology and Water Resources

Chesterfield does not directly border any large bodies of water; however, several creeks run through the township before feeding into the nearby Delaware River. The Crosswicks Creek forms the northern border of the township, while Blacks Creek flows northward along the township's eastern border before turning westward and bisecting the township. Smaller creeks in Chesterfield include Assiscunk Creek, Crafts Creek, and North Run.

Surface Water

Watersheds

A watershed is an area of land that resembles a basin in shape, surrounded by areas of higher elevation. Any watershed drains all of its surface water bodies, groundwater, and rainfall to a common outlet, such as the outflow of a reservoir, the mouth of a bay, or the point where a tributary discharges into a larger stream. Larger watersheds can contain many smaller watersheds, or "subwatersheds." For example, the Delaware River watershed contains all of the watersheds of the streams that drain into the Delaware River and then into the Delaware River Bay and Atlantic Ocean, where the common outlet is the point where that stream meets the Delaware River. Watersheds are natural ecological units and have distinct biotic and abiotic characteristics.

Each watershed has its own Hydrologic Unit Code, or HUC, which is a series of numbers determined by the USGS that defines that watershed. The fewer the number of digits in the HUC, the larger the size of the watershed: HUC-2 watersheds have two-digit codes and have areas of tens of thousands of square miles, while HUC-12 watersheds, with 12-digit codes, are often less than 50 square miles. Smaller watersheds are naturally nested within larger watersheds.

Crosswicks Creek Tributary | Source: Miles Owen

NJDEP monitors HUC-11 and HUC-14 watersheds in the state. New Jersey has 152 HUC-11 watersheds and over 900 HUC-14 subwatersheds. The HUC-11 watersheds in New Jersey average about 60 square miles. HUC-14 watersheds are about nine square miles on average, so approximately six or seven HUC-14 watersheds would typically be nested within a single HUC-11 watershed. Chesterfield includes parts of six HUC-11 watersheds and all or parts of ten HUC-14 subwatersheds, shown in **Table 8: HUC-11 and HUC-14 Watersheds in Chesterfield** on the following page**.**

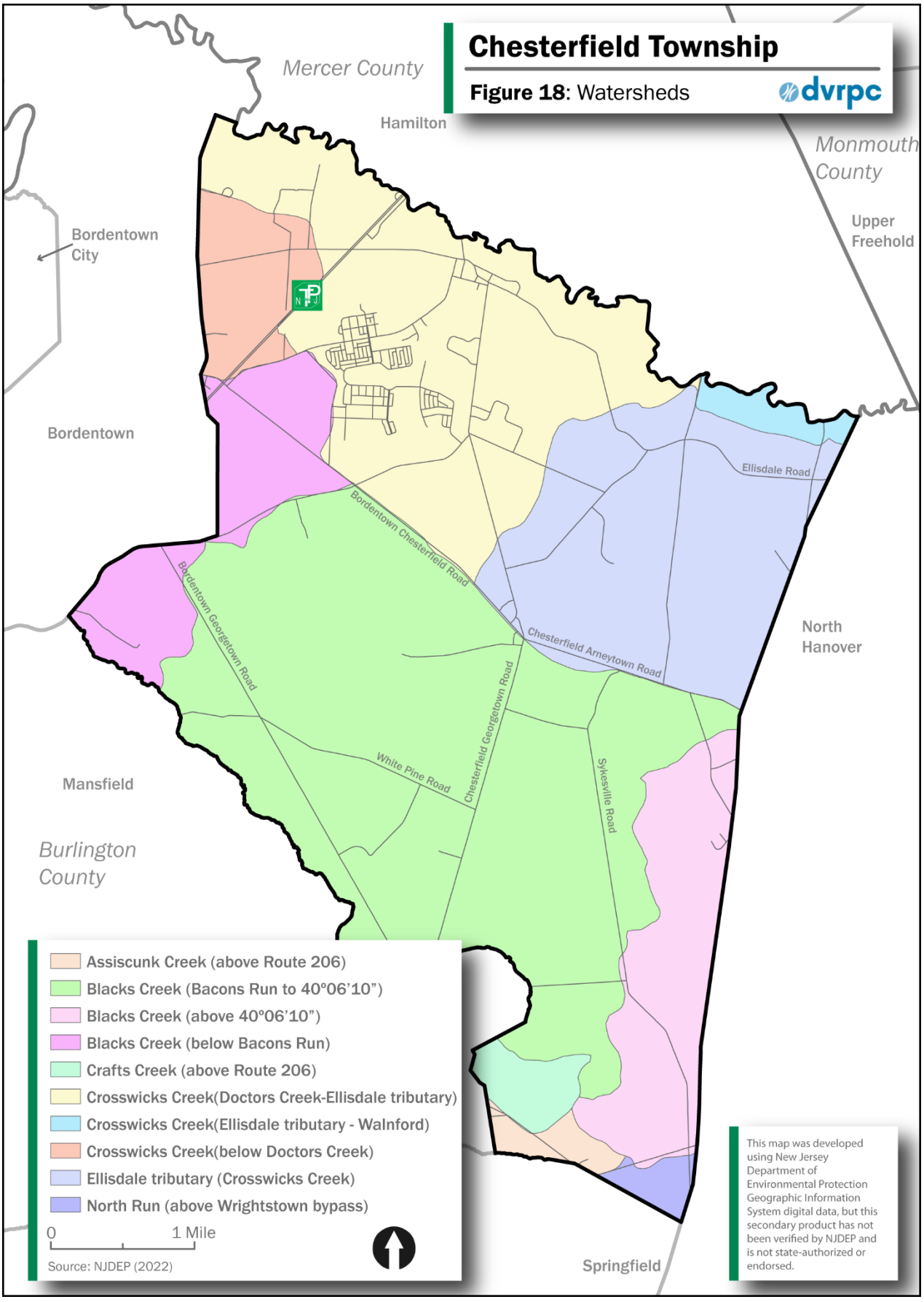
A majority of Chesterfield lies within the Blacks Creek watershed, which comprises 7,395.82 acres in the township (53.87 percent of Chesterfield's area) and occupies much of the township's southern half. Most of the northern half of the township lies within the Crosswicks Creek (Doctors Creek to New Egypt) watershed. A portion of the township close to its northwestern corner includes the Crosswicks Creek (below Doctors Creek) watershed. The southeastern corner of the township is split between the Assiscunk Creek, Crafts Creek, and the Crosswicks Creek (above New Egypt) watersheds.

Table 8: HUC-11 and HUC-14 Watersheds in Chesterfield

Watershed Name	Hydrologic Unit Code (HUC)	Acreage within Chesterfield	Percent
Crosswicks Creek (below Doctors Creek)	**02040201070**	**525.92**	**3.83%**
Crosswicks Creek (below Doctors Creek)	02040201070020	525.92	3.83%
Assiscunk Creek	**02040201100**	**138.52**	**1.01%**
Assiscunk Creek (above Rt 206)	02040201100010	138.52	1.01%
Blacks Creek	**02040201080**	**7,395.82**	**53.87%**
Blacks Creek (above 40d06m10s)	02040201080010	1131.82	8.24%
Blacks Creek (Bacons Run to 40d06m10s)	02040201080020	5,333.60	38.85%
Blacks Creek (below Bacons Run)	02040201080030	930.40	6.78%
Crosswicks Ck (Doctors Ck to New Egypt)	**02040201050**	**5,352.99**	**38.99%**
Crosswicks Creek (Ellisdale trib - Walnford)	02040201050050	152.18	1.11%
Ellisdale trib (Crosswicks Creek)	02040201050060	152.18	1.11%
Crosswicks Creek (Doctors Ck - Ellisdale trib)	02040201050070	2,936.76	21.39%
Crosswicks Creek (above New Egypt)	**02040201040**	**109.59**	**0.80%**
North Run (above Wrightstown bypass)	02040201040060	109.59	0.80%
Crafts Creek	**02040201090**	**205.17**	**1.49%**
Crafts Creek (above Rt 206)	02040201090010	205.17	1.49%

Source: NJDEP, 2000 (HUC-11 watersheds) and 2009 (HUC-14 watersheds)

Note: "Above" in watershed names means upstream, while "below" means downstream of major roads or landmarks.


Chesterfield Township
Figure 18: Watersheds
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
Assiscunk Creek (above Route 206)
Blacks Creek (Bacons Run to 40°06'10")
Blacks Creek (above 40°06'10")
Blacks Creek (below Bacons Run)
Crafts Creek (above Route 206)
Crosswicks Creek(Doctors Creek-Ellisdale tributary)
Crosswicks Creek(Ellisdale tributary - Walnford)
Crosswicks Creek(below Doctors Creek)
Ellisdale tributary (Crosswicks Creek)
North Run (above Wrightstown bypass)
0
1 Mile
Source: NJDEP (2022)
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.

Blacks Creek Watershed

This watershed drains 23.4 square miles of land in Burlington County into the Delaware River in Bordentown. Approximately 7,396 acres (53.87 percent) of Chesterfield is located in this watershed.

Crosswicks Creek (Doctors Creek to New Egypt) Watershed

This watershed drains 57.0 square miles of land in Burlington, Monmouth, and Mercer counties into the Delaware River through the Crosswicks Creek (below Doctors Creek) watershed. Approximately 5,353 acres (38.99 percent) of Chesterfield is located in this watershed.

Crosswicks Creek (below Doctors Creek) Watershed

This watershed drains 20.1 square miles of land in Burlington and Mercer counties into the Delaware River from Crafts Creek near Bordentown. Approximately 526 acres (3.83 percent) of Chesterfield is located in this watershed.

Assiscunk Creek Watershed

This watershed drains 45.9 square miles of land in Burlington County into the Delaware River in the Town of Burlington. Approximately 139 acres (1.01 percent) of Chesterfield is located in this watershed.

Crafts Creek Watershed

This watershed drains 28.9 square miles of land in Burlington County into the Delaware River near Roebling. Approximately 205 acres (1.49 percent) of Chesterfield is located in this watershed.

Crosswicks Creek (above New Egypt) Watershed

This watershed drains 41.2 square miles of land in Burlington and Ocean counties into the Delaware River through the Crosswicks Creek (Doctors Creek to New Egypt) and Crosswicks Creek (below Doctors Creek) watersheds. Approximately 110 acres (0.80 percent) of Chesterfield is located in this watershed.

Watershed Management Area 20

NJDEP uses watersheds as a unit of area for managing natural resources, and has divided the state into 20 Watershed Management Areas for this purpose. Chesterfield is within Watershed Management Area 20, known as the Assiscunk, Crosswicks & Doctors Region, which consists of 253 square miles in west central New Jersey including parts of Burlington, Mercer, Monmouth, and Ocean counties, including a portion of the City of Trenton. The main subwatersheds within this Watershed Management Area include Assiscunk Creek, Blacks Creek, Crafts Creek, Crosswicks Creek, Doctors Creek, and Duck Creek, all of which drain into the Delaware River. The land in this Watershed Management Area ranges from highly urbanized along the Delaware River to forested and agricultural inland and to the east.

Streams

Chesterfield contains or is adjacent to nine named streams: Assiscunk Creek, Bacons Run, Blacks Creek, Crafts Creek, Crosswicks Creek, Fern Brook, Pleasant Run, Sucker Run, and Thorton Creek.

Chesterfield contains 74.16 stream miles within its boundaries, about 49.32 miles of which are first- or second-order streams (66 percent). First-order streams are the initial sections of stream channels with no contributing tributaries, and second-order streams are stream channels formed from only one branching section of tributaries above them. In Chesterfield, the entirety of Assiscunk Creek and portions of Bacons Run, Crafts Creek, Fern Brook, Sucker Run, and Thorton Creek are first-order streams. The remainder of the first-order streams in the township are tributaries of the other major creeks and rivers.

First- and second-order streams are considered “headwater” streams. The headwaters are where a stream is “born” and actually begins to flow. Headwaters are of particular importance because they tend to contain a high diversity of aquatic species, and the condition of these waters affects the water quality found downstream.

Headwaters drain only a small area of land, usually no larger than one square mile (640 acres). Because of their small size, they are highly susceptible to impairment by human activities on the land. First- and second-order streams are narrow and often shallow, and are characterized by a relatively small base flow, which is the portion of stream flow that comes from groundwater seepage, not surface water runoff. These physical characteristics make first- and second-order streams subject to greater temperature fluctuations, especially when vegetation on their banks – particularly forest land – is removed. The quality of first- and second-order streams can also easily be degraded by excess turbidity, which is water pollution that occurs when stormwater filled with soils and sediments (eroded or weathered sands and gravels) enters the water. In addition, first-order streams are greatly affected by changes in the local water table (see definition) because of their small base flows. Headwaters are important sites for the aquatic life that is at the base of the food chain and often serve as spawning or nursery areas for fish.

Water table: The boundary between water-saturated ground and unsaturated ground. Below the water table, water fills all air pockets between soil particles or rocks.

Table 9: Chesterfield Stream Orders

Stream Order	Total Length (miles)
First (smallest)	35.44
Second	18.19
Third	11.48
Fourth	11.32
Fifth	1.57
Sixth	9.60
Total	87.60

Source: NJDEP, 2018

Ponds

Chesterfield contains 65.78 acres of ponds. These are scattered throughout the residential, commercial, and agricultural areas of the township. The largest of these ponds, approximately 12 acres in size, is located along Blacks Creek near the township’s eastern border between Chesterfield Jacobstown Road and Sykesville Road.

Wetlands

Wetlands have numerous definitions and classifications based on their diversity and the regulation of their uses. The basic definition of a wetland is an area that has enough water at some time during the year to stress plants and animals that are not adapted to life in water or saturated soils.

Wetland soils, which are also known as hydric soils, are areas where the land is saturated for at least seven consecutive days during the growing season. While wetlands almost always require the presence of hydric soils, hydric soils are not always wetlands. For land to be considered a natural wetland, it must have vegetation unique to wetlands and hydric soils.

New Jersey protects freshwater (interior) wetlands under the New Jersey Freshwater Wetlands Protection Act Rules: N.J.A.C. 7:7A. This law also protects transitional areas, or "buffers," around freshwater wetlands. The standard width of the transition area that is protected is 150 feet around a freshwater wetland of "exceptional resource value," which is defined as one that either discharges into trout supporting waters or has been documented as habitat for a threatened or endangered species. The standard extent of the transitional area that is protected around a freshwater wetland of "intermediate resource value" (one that is not of "exceptional resource value" or "ordinary") is 50 feet.

NJDEP's published freshwater wetland maps provide guidance on where wetlands are found in New Jersey, but they are not the final word on location. Only an official determination from NJDEP, called a "letter of interpretation" (LOI), can formally designate the presence of freshwater wetlands on a property. An LOI verifies the presence, absence, or boundaries of freshwater wetlands and transition areas on a site. Authorization is required for most activities within wetlands and their associated transition areas under the NJ Freshwater Wetlands Protection Act rules, with very few exemptions. Violations of the wetland regulations will result in penalties determined by NJDEP. Additional information on wetlands rules and permits is available through the NJDEP Division of Land Use Regulation and on its website under "Freshwater Wetlands."

Based on NJDEP's land use/land cover data, there are 3,461 acres total wetland acres in Chesterfield (25.20 percent of the township). Approximately 2,380 acres feature natural wetlands vegetation: wetlands that have experienced less human alteration and are more likely to contain typical or indigenous plants and animals that are native to that wetland type. Of Chesterfield's naturally-vegetated wetlands, 2,131.51 acres are classified as forested wetlands and 151.18 acres are scrub/shrub wetlands. Wetlands are distributed across Chesterfield but particularly concentrated around streams. All of the township's wetlands are freshwater. More information on Chesterfield's naturally-vegetated wetland areas is found in the **Natural Vegetation: Wetlands** section on page 83.

In addition to Chesterfield's naturally-vegetated wetlands, the township contains 1,081 acres of modified wetlands, which are former natural wetland areas that have been altered by human activities, such as agriculture or development, and no longer support typical natural wetlands vegetation. Categories of modified wetlands in Chesterfield include:

- Agricultural wetlands (959.94 acres)
- Former agricultural wetlands (15.89 acres)
- Disturbed/managed wetlands (14.36 acres)
- Managed wetlands in built-up, maintained recreational areas (62.17 acres)
- Managed wetlands in maintained lawn greenspace (5.92 acres)
- Wetland rights-of-way (22.62 acres)

Agricultural Wetlands

Chesterfield has approximately 960 acres of agricultural wetland sites (6.99 percent of the township). Agricultural wetlands are modified former wetland areas currently under cultivation. These areas still show evidence of soil saturation, but they no longer support natural wetland vegetation, being instead planted with commercial crops.

Disturbed/Managed Wetlands

Chesterfield has approximately 105 acres of disturbed or managed wetlands (0.80 percent of the township). These wetlands no longer support the typical natural wetlands vegetation found in analogous unaltered natural areas but do show signs of soil saturation and exist in areas shown to have hydric soils on U.S. Soil Conservation Service soil surveys.

Surface Water Quality

Chesterfield's Stream Designations

Chesterfield's streams are categorized to maintain surface water quality standards. The standards themselves are established by federal and state governments to ensure that the water is suitable for its intended use. For example, the Federal Clean Water Act (P.L. 95-217) requires that, wherever possible, water quality standards provide water suitable for fish, shellfish, and wildlife to thrive and reproduce, and for people to swim and boat. Furthermore, the water quality for all streams must be able to support designated uses that are assigned to each water body classification by the State of New Jersey, as outlined in Surface Water Quality Standards N.J.A.C 7:9B-1.12. Each classification has a corresponding set of water-quality criteria, or numerical concentration values, that must be met.

All of the waterways in Chesterfield are classified as FW2-NT. The "FW2 " code indicates that the streams are all freshwater, and none of them are wholly within federal or state lands. The "NT" code indicates that the water bodies in Chesterfield do not produce or maintain trout. According to NJDEP rules, FW2-NT waters must provide for (1) the maintenance, migration, and propagation of the natural and established plants and wildlife; (2) primary and secondary contact recreation (i.e., swimming and fishing/boating); (3) industrial and agricultural water supply; and (4) a drinkable water supply after conventional filtration and disinfection.

The determination of whether or not water quality is sufficient to meet a water body's designated use(s) is based on whether the water body is within established limits for certain surface water quality parameters. Some examples of surface water quality parameters include fecal coliform, dissolved oxygen (the amount of oxygen in a body of water), potential of hydrogen(pH), phosphorus, and toxic substances. NJDEP also evaluates water quality by examining the health of aquatic life in a stream.

Surface Water Quality Protection Categories

In addition to the classifications above, NJDEP has three tiers of surface water quality protection: Outstanding National Resource Waters, Category 1 Waters, and Category 2 Waters. All of Chesterfield's waterways fit in the Category 2 tier, except for Assiscunk Creek, which is Category 1. Category 1 waters have additional requirements for protection, including 300-foot-wide riparian buffers, in order to better maintain their superior aesthetic value or ecological integrity. By contrast, Category 2 waters allow some amount of reduction in water quality to accommodate necessary and important social and economic development.

New Jersey's Integrated Water Quality Monitoring and Assessment Report

The Federal Clean Water Act mandates that states submit biennial reports to the U.S. Environmental Protection Agency (EPA) describing the quality of their waters. States must submit two reports: the Water Quality Inventory Report, or "305(b) Report," documenting the status of principal waters in terms of overall water quality and support of designated uses, and a list of water bodies that are not attaining water quality standards–the "303(d) List."

States must also prioritize 303(d)-listed water bodies for Total Maximum Daily Load (TMDL) analyses. A TMDL is the amount of a pollutant that a water body can assimilate (its loading capacity) without violating water quality standards. This priority list identifies those water bodies for which the state anticipates establishing TMDLs in the next two years.

NJDEP integrates the 303(d) List and the 305(b) Report into a single report according to EPA's guidance. The 2018-2020 Integrated Water Quality Monitoring and Assessment Report places the state's waters onto one of five "sublists." See the key on page 58, which follows **Table 10: Integrated Water Quality Monitoring and Assessment Report (2018-2020)**, for more information on each sublist.

NJDEP bases the assessment of entire HUC-14 watersheds (which serve as "assessment units") on the results of one or more monitoring sites within the watershed. The results from monitoring sites located within each HUC-14 subwatershed are extrapolated to represent all of the water bodies within the entire HUC boundary. In practice, the HUC-14 approach provides a more conservative assessment since any impairment (a term similar to "pollution") of any water body in a given HUC- 14 watershed will result in that entire watershed being listed as impaired for that use or parameter. In addition, where a HUC-14 watershed contains waters of different classification, the more stringent classification is used to assess impairment, and that impairment is then applied to the entire watershed. Because of the degree of extrapolation required for this approach, NJDEP performs more detailed testing to determine the actual cause, source, and extent of impairment in the HUC-14 watershed before developing a TMDL or taking other regulatory action to address the impairment.

NJDEP identifies the designated uses applicable to each HUC-14 watershed and determines whether each water quality monitoring station located in that watershed indicates that the water quality standards that correspond with the designated uses are met. Not all designated uses are applicable for all HUC-14 watersheds. The assessment unit (the HUC-14 watershed) is then placed on the appropriate sublist (Sublists 1–5) for each use.

Table 10: Integrated Water Quality Monitoring and Assessment Report (2018-2020) shows the published status of each of Chesterfield's HUC-14 watersheds. As shown in **Table 10**, an assessment unit may be listed on one or more sublists (i.e., on Sublist 2 for drinking water, Sublist 3 for aquatic life, etc.). However, an assessment unit can only be placed on Sublist 1 if all uses for that assessment unit are attained. To determine whether or not an assessment unit supports a designated use, NJDEP identifies a suite of parameters (such as arsenic or *E. coli*) that serve as the minimum dataset associated with each designated use.

If one or more designated uses are assessed as "nonattainment" (Sublist 5), the pollutant(s) or impairment causing the nonattainment status is identified on the "303(d) List of Impaired Waters with Priority Ranking." When the pollutant causing nonattainment is unknown, the pollutant is listed as "pollutant unknown" or "toxic unknown." The ranking (Low, Medium, High) refers to the priority given to a specific assessment unit when

determining the schedule for a TMDL. **Table 11: 303(d) List of Impaired Waters with Priority Ranking** lists Chesterfield's nonattaining assessment units, the water quality parameters that cause them to be nonattaining, and their ranking.

Table 10: Integrated Water Quality Monitoring and Assessment Report (2018-2020)

Assessment Unit (HUC-14 Watershed)	HUC ID	Aquatic Life (General)	Recreation	Drinking Water Supply	Fish Consumption
Crosswicks Creek (below Doctors Creek)	02040201070020	Non support (5)	Non support (5)	Non support (5)	Non support (5)
Assiscunk Creek (above Rt 206)	02040201100010	Non support (4)	Non support (4)	Non support (5)	Insufficient data (3)
Blacks Creek (above 40d06m10s)	02040201080010	Non support (4)	Full support (2)	Full support (2)	Insufficient data (3)
Crosswicks Creek (Doctors Creek - Ellisdale trib)	02040201050070	Non support (5)	Non support (4)	Non support (5)	Non support (5)
Crosswicks Creek (Ellisdale trib - Walnford)	02040201050050	Non support (5)	Non support (4)	Non support (5)	Non support (4)
North Run (above Wrightstown bypass)	02040201040060	Non support (5)	Non support (5)	Non support (5)	Insufficient data (3)
Blacks Creek (below Bacons Run)	02040201080030	Non support (5)	Non support (5)	Non support (5)	Non support (5)
Ellisdale trib (Crosswicks Creek)	02040201050060	Non support (5)	Non support (4)	Non support (5)	Non support (4)
Crafts Creek (above Rt 206)	02040201090010	Non support (5)	Non support (5)	Full support (2)	Insufficient data (3)
Blacks Creek (Bacons Run to 40d06m10s)	02040201080020	Non support (5)	Non support (4)	Full support (2)	Insufficient data

Source: NJDEP, 2022

Sublist Number	Sublist Description
1	The designated use is assessed and attained AND all other designated uses in the assessment unit area are assessed and attained (fish consumption use is not factored into this determination based on EPA guidance).
2	The designated use is assessed and attained BUT one or more designated uses in the assessment unit are not attained, and/or there is insufficient data to make a determination.
3	Insufficient data is available to determine if the designated use is attained.
4	The designated use is not attained or is threatened; however, development of a TMDL is not required for one of the following reasons: 4A: A TMDL has been completed for the pollutant causing nonattainment; 4B: Other enforceable pollution control requirements are reasonably expected to result in the conformance with the applicable water quality standard(s) in the near future and the designated use will be attained through these means; or 4C; Nonattainment is caused by something other than a pollutant.
5	The designated use is not attained or is threatened by a pollutant or pollutants, and a TMDL is required.

Source: NJDEP, 2022

Table 11: 303(d) List of Impaired Waters with Priority Ranking

Assessment Unit (HUC-14 Subwatershed)	HUC ID	Parameters	Ranking
Crosswicks Creek (below Doctors Creek)	02040201070020	Arsenic	Low
		Biological-Cause Unknown	Low
		E. Coli	Medium
		PCBs in fish tissue	Low
		Phosphorus, total	Medium
		Total suspended solids (TSS)	Medium

Assessment Unit (HUC-14 Subwatershed)	HUC ID	Parameters	Ranking
Assiscunk Creek (above Rt 206)	02040201100010	Arsenic	Low
Crosswicks Creek (Doctors Creek - Ellisdale trib)	02040201050070	Arsenic	Low
		Mercury in fish tissue	Low
		PCBs in fish tissue	Low
		Phosphorus, Total	Medium
		Total Suspended Solids (TSS)	Medium
		Turbidity	Medium
Crosswicks Creek (Ellisdale trib - Walnford)	02040201050050	Arsenic	Low
		Lead	Low
		Phosphorus, Total	Medium
North Run (above Wrightstown bypass)	02040201040060	Arsenic	Low
		E. Coli	Medium
		Phosphorus, Total	Medium
Blacks Creek (below Bacons Run)	02040201080030	Biological-Cause Unknown	Low
		E. Coli	Medium
		PCBs In Fish Tissue	Low
		Phosphorus, Total	Medium
		Total Dissolved Solids (TDS)	Medium
		Total Suspended Solids (TSS)	Medium
Ellisdale tributary (Crosswicks Creek)	02040201050060	Arsenic	Low

Assessment Unit (HUC-14 Subwatershed)	HUC ID	Parameters	Ranking
		Biological-Cause Unknown	Low
		Phosphorus, Total	Medium
		Total Suspended Solids (TSS)	Medium
		Turbidity	Medium
Crafts Creek (above Rt 206)	02040201090010	Biological-Cause Unknown	Low
		E. Coli	Medium
		Phosphorus, Total	Medium
		Arsenic	Low
		E. Coli	Medium
		PCBs in fish tissue	Low
Blacks Creek (Bacons Run to 40d06m10s)	02040201080020	Biological-Cause Unknown	Low

Source: NJDEP, 2022

In 2020, all the subwatersheds located in Chesterfield except Blacks Creek (above 40d06m10s) were identified on the 303(d) list. Among these subwatersheds, the most common pollutants were arsenic and phosphorus, which were each present in seven of the nine polluted subwatersheds. Other common pollutants in Chesterfield's waters include E. Coli, PCBs, and Total Suspended Solids (TSS).

Arsenic is a toxic metalloid formerly used as a component in pesticides and for treating wood. In addition to industrial pollution, water bodies can accumulate arsenic from natural sources, as some rocks have naturally high levels of the element. Arsenic accumulates in the tissues of fish and shellfish, although mostly as a component of the less toxic organic compound arsenobetaine. Arsenic contamination primarily affects a water body's attainment level for use as drinking water.

Phosphorus exists naturally at low levels within the environment, although excess phosphorus can lead to harmful algae blooms, which can produce "dead zones" where no aquatic life can survive. Typical causes of phosphorus pollution include overfertilization of lawns and agricultural areas; water runoff from impervious surfaces like parking lots, rooftops, roadways; and, to a lesser degree, discharge from wastewater treatment plants and overflow from septic systems. Soil erosion is a major contributor of phosphorus to streams, and stream bank erosion occurring during floods can transport high quantities of phosphorus into the water system.

E. coli is a type of fecal coliform bacteria present in the digestive systems of humans and animals, and are an indicator of the presence of fecal material. Domestic sewage overflow, agricultural runoff, or other nonpoint sources of human and animal waste (including those from pets and waterfowl) can cause fecal coliform contamination in water bodies. Potential health risks for individuals exposed to fecal coliform include ear infections, dysentery, typhoid fever, viral and bacterial gastroenteritis, and hepatitis A.

PCBs were used as coolants and lubricants in electrical equipment from the 1940s until 1977, when their manufacture was stopped due to evidence of their harmful effect on the environment. PCBs break down very slowly in the environment and accumulate in water, soil, air, and animal life. Exposure to PCBs can cause skin conditions and impair the liver and immune system in humans.

Total suspended solids (TSS) refer to solid materials, both organic and inorganic, that are suspended in water. High concentrations of TSS make water warmer by absorbing sunlight, while also blocking sunlight from reaching aquatic plants, decreasing photosynthesis, and reducing oxygen in the water, which then kills aquatic animal life. These materials enter water bodies through stormwater runoff, streambank erosion, industrial wastes, wastewater discharges, improperly managed construction sites, and other sources.

Water Quality Monitoring Networks

The determination of whether or not water quality is sufficient to meet an assessment unit's (HUC-14 watersheds) designated uses is based on testing results from various water quality monitoring networks. Information about these monitoring stations is included in **Table 12: Water Quality Sampling Locations within and Upstream of Chesterfield.**

NJDEP's Monitoring Networks

Across the state, NJDEP primarily relies on two water quality monitoring networks: the Ambient Surface Water Quality Monitoring Network (ASWQMN) and the Ambient Biomonitoring Network (AMNET).

NJDEP runs the ASWQMN in cooperation with the USGS. This network contains 126 stations: 76 are in fixed locations and 50 move locations on a periodic basis. ASWQMN sites monitor for nutrients (i.e., phosphorus and nitrogen), bacteria, metals, sediments, dissolved oxygen, pH, or other parameters. There is one ASWQMN station in Chesterfield, as well as two upstream along Crosswicks Creek and Doctors Creek in Extonville and Allentown, respectively.

AMNET, administered solely by NJDEP, evaluates the health of aquatic life as a biological indicator of water quality. The network includes over 820 monitoring sites located throughout the state. Each station is sampled once every five years. There are two AMNET stations within Chesterfield as well as five stations further upstream in Allentown, Upper Freehold, and Plumsted.

Each site is tested only for the diversity of aquatic life. In testing this water quality parameter, NJDEP samples streams for benthic (bottom-dwelling) macroinvertebrates, which include such insects as dragonfly and caddisfly larvae, clams, mussels, snails, worms, and crustaceans that are large enough to be seen by the naked eye. Macroinvertebrates are studied because they are a good indicator species: if pollution harms a stream, their populations are adversely affected and require a significant amount of time to recover. While chemical tests measure water quality on a given day, the presence or absence of macroinvertebrates represents water quality changes over a longer period preceding the testing day. Water bodies are rated based on the number of different species of organisms present, as well as the number of individuals within those populations.

Table 12: Water Quality Sampling Locations within and just upstream of Chesterfield

Site Name	Site Number	Program Name	Municipality
Blacks Creek	01464527	ASWQMN	Chesterfield
Crosswicks Creek	01464500	ASWQMN	Extonville
Doctors Creek	01464515	ASWQMN	Allentown
Blacks Creek	AN0132	AMNET	Chesterfield
Crosswicks Creek	AN0121	AMNET	Plumsted
Crosswicks Creek	AN0125	AMNET	Chesterfield
Doctors Creek	AN0127	AMNET	Upper Freehold
Doctors Creek	AN0129	AMNET	Allentown

Sources: USGS, NJDEP, National Water Monitoring Council, 2022

Total Maximum Daily Loads (TMDLs)

For impaired waters (waters on Sublist 5), the state is required by the EPA to establish a TMDL. As mentioned previously in the section on New Jersey's Integrated Water Quality Monitoring and Assessment Report, a TMDL quantifies the amount of a pollutant a water body can assimilate (its loading capacity) without violating water quality standards. The purpose of a TMDL is to initiate a management approach or restoration plan based on the sources of pollutants and the percentage reductions of each pollutant that must be achieved to attain water quality standards. These sources can be point sources, coming from a single "point," such as a sewage treatment plant; or nonpoint sources, which come from a collection of sources, such as runoff from various types of residential, commercial, or agricultural lands.

Table 10 indicates that nine HUC-14 watersheds in Chesterfield are listed on Sublist 5. Chesterfield has 15 TMDLs, but none of its watersheds are scheduled to receive TMDL reports as per NJDEP's two-year TMDL schedule (2018/2020).

Implementation of a TMDL relies on actions mandated by the Municipal Stormwater Regulation Program, including the ordinances required to be adopted by municipalities under that permit. It also depends on private landowners making voluntary improvements to their land.

Potential Causes of Water Quality Impairments

Point Sources

Point sources of discharge, which come from a single source or "point," such as an industrial pipe discharge, are regulated by NJDEP through the New Jersey Pollution Discharge Elimination System (NJPDES). New Jersey created NJPDES in response to the Federal Clean Water Act of 1972, which mandated that each state develop water quality standards and regulate the amount of pollution entering water bodies. The act classified all water pollution into one of two categories: "point source" pollution coming from a single source, such as an industrial pipe; and "nonpoint source" pollution, which comes from many diffuse sources. Although the Federal Clean Water Act only required states to regulate point sources, New Jersey also regulates nonpoint sources through the authority of the NJPDES rules (see the **Nonpoint Sources** subsection on page 66).

NJDEP, through the Division of Water Quality and the Bureau of Surface Water and Pretreatment Permitting, administers the NJPDES program (N.J.A.C. 7:14A). Under NJPDES, any facility discharging domestic or industrial wastewater directly into surface water or groundwater (usually through a septic system) must apply for and obtain a permit for discharging. Rather than creating individually tailored permits for every facility, the Division of Water Quality uses scientific standards to create and issue general permits for different categories of dischargers. NJDEP enforces the terms of NJPDES permits by visiting discharging facilities and requiring facilities to periodically conduct water quality, biological and toxicological analyses, and thermal impact and cooling water assessments.

Table 13: Point Source Discharge Permits in Chesterfield

NJPDES Permit Number	Program Interest Number	Facility Name	Address	Discharge Category	Expiration Date
NJ0026719	46684	Albert C Wagner Youth Correctional Facility	500 Ward Ave Chesterfield Twp, NJ 085052928	Sanitary Wastewater (IP) (A)	03/31/24
NJ0105392	47557	Old York Country Club	228 Old York Rd Chesterfield, NJ 08015	Discharge to Groundwater (IP) (GW)	12/31/24
NJG0153559	171646	Chesterfield Twp	300 Bordentown Chesterfield Rd Chesterfield Twp, NJ 08620	MS4 - Tier A Municipal Stormwater (GP) (R9)	12/31/27
NJG0155039	225161	Garden State Youth Correctional Facility	Highbridge Rd Chesterfield Twp, NJ 08620	MS4 - Public Complex Stormwater (GP) (R11)	12/31/28
NJG0181731	532658	Village Square Park	Stevenson Ln Chesterfield, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0188743	551027	NJ Turnpike Interchange 6 to 9 Chesterfield	NJ Turnpike Interchange 6 to 9, Contract T869.120.302 Chesterfield, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27

NJPDES Permit Number	Program Interest Number	Facility Name	Address	Discharge Category	Expiration Date
NJG0200816	46684	Albert C Wagner Youth Correctional Facility	500 Ward Ave Chesterfield Twp, NJ 08505	Sludge Quality Category 2 (GP) (S2G)	12/31/28
NJG0222909	625207	Bordentown-Chesterfield Rd & Old York Rd	Bordentown-Chesterfield & Old York Rd Chesterfield Twp, NJ 08602	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0228532	646350	Ward Ave. Substation	503 Ward Ave. Chesterfield, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0230677	651956	NJ Turnpike Interchange 6 to 9 Widening Prog Contract 904	NJ Turnpike Southbound Lanes, North of Ward Avenue Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0235342	47557	Old York Country Club	228 Old York Rd Chesterfield, NJ 08015	Sludge Quality Exempt (GP) (SXG)	12/31/25
NJG0240346	681287	Wagner Steam Line Replacement	500 Ward Ave. Bordentown Twp, NJ 08505	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0251208	717719	NJ Turnpike Maintenance District 3	NJ Turnpike M.P. 56.0nb Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0252352	719865	Garden State Exp. Station 203-Compressor Stat	26 Bordentown-Chesterfield Road Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0252361	719866	Garden State Expansion Station 203-Substation	14 Bordentown-Chesterfield Road Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0253952	723563	Chesterfield Municipal Complex	295 Bordentown - Chesterfield Road Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0272311	761766	Colonial Pipeline Allentown Pv Array	493 Ward Avenue Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0273660	764331	Line 3 Ac Mitigation Pipeline Maintenance Pro	Colonial Allentown Station, Ward Ave. Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0273902	764647	The Shops at Old York Village	Old York Road, Saddle Way Chesterfield, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0292699	800829	PSE&G Trenton-Burlington Outside Plant Proj.	Ward Avenue Chesterfield, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0296562	810347	PSE&G Ward Avenue Substation	503 Ward Avenue Chesterfield, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0298565	813686	Matthew Lynch	517 Ward Avenue Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27

NJPDES Permit Number	Program Interest Number	Facility Name	Address	Discharge Category	Expiration Date
NJG0308765	859642	NJNG- Southern Reliability Link	Various Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0350541	47557	Old York Country Club	228 Old York Rd Chesterfield, NJ 08015	Construction Activity Stormwater (GP) (5G3)	02/28/27
NJG0353337	1043120	Active Acquisitions OY, LLC	228 Old York Road Chesterfield Twp, NJ 08515	Construction Activity Stormwater (GP) (5G3)	02/28/27

Source: NJDEP, 2024

As of April 2024, there are 23 active NJPDES permits for point source discharges in Chesterfield, as shown in **Table 13: Point Source Discharge Permits in Chesterfield**. More information on these permits is available at NJDEP's DataMiner data portal.

Nonpoint Sources

Nonpoint source pollution, which comes from a wide variety of sources rather than from a single point, such as a discharge pipe, has a detrimental effect on the water quality and ecology of streams in most townships, including Chesterfield. Nonpoint sources are the most difficult to identify and remediate because they are diffuse, widespread, and cumulative in their effect.

Nonpoint source pollution in Chesterfield is derived from stormwater drainage of paved surfaces, such as streets and parking lots, commercial/industrial areas, residential sites (with and without detention basins), lawns, and from agricultural fields that lack adequate vegetative buffers. Some of this runoff comes to the waterways from similar sources in upstream townships, and some of it derives from Chesterfield's land uses.

Nonpoint source pollutants contained in stormwater runoff include the following: excess fertilizers, herbicides, and insecticides from residential lawn areas; oil, grease, rubber, and toxic chemicals from automobiles and improper disposal of household wastes; acid rain and mercury from fossil fuel-fired energy production; sediment from improperly managed construction sites and forest lands, and eroding stream banks; salt from streets treated during winter precipitation events; nutrients from yard waste left to decompose on the street; and bacteria and nutrients from geese, pet wastes, and faulty septic systems.

In February 2004, NJDEP issued a new Stormwater Management Rule, as required by EPA's Phase II Stormwater Management Program for Municipal Separate Stormwater Sewer Systems (MS4). Its most recent update was in 2020. The rule lays out guidance and requirements for management of and education about stormwater at the local level. The rule applies to entities that contain stormwater systems that are separated from regular sewer systems, including municipalities, county road departments, and public institutional facilities on large sites (such as hospitals and colleges). Each entity with this type of sewer system is required to obtain an MS4 general permit for the stormwater system.

Under this permit, a municipality must meet certain specific requirements in planning, ordinance adoption, education, and management of township facilities and investigation of parts of the stormwater system. Municipalities are classified as either Tier A or Tier B under the stormwater rules. Chesterfield is classified as a Tier B municipality, having a lower population level and density. It is therefore subject to less stringent

requirements than denser and more populous Tier A municipalities. Chesterfield has addressed these requirements with Stormwater Management Regulations approved in 2005 and revised in 2006 and 2021.

Municipalities may adopt more restrictive stormwater requirements than those required by New Jersey, which sets minimum requirements. All development, regardless of its size or how it is regulated, should have stormwater impacts considered. Chesterfield's Stormwater Regulations require major developments, defined as those disturbing one acre or more of land or creating one-quarter acre or more of impervious surface or motor vehicle surface, to use green infrastructure Best Management Practices and nonstructural stormwater management strategies to achieve flood control, groundwater recharge, and pollution reduction. These regulations are intended to reduce stormwater runoff volume as well as erosion, encourage infiltration and groundwater recharge, and reduce pollution.

Stormwater Management Planning Goals

The general goals and requirements for stormwater management planning for the State of New Jersey are laid out in the New Jersey Administrative Code (NJAC) 7:8 Subchapter 2 General Requirements for stormwater management planning.

All stormwater management plans and stormwater control ordinances shall be designed to:

1. Reduce flood damage, including damage to life and property;

2. Minimize, to the extent practical, any increase in stormwater runoff from any new development;

3. Reduce soil erosion from any development or construction project;

4. Assure the adequacy of existing and proposed culverts and bridges, and other instream structures;

5. Maintain groundwater recharge;

6. Prevent, to the greatest extent feasible, an increase in nonpoint pollution;

7. Maintain the integrity of stream channels for their biological functions, as well as for drainage;

8. Minimize pollutants in stormwater runoff from new and existing development in order to restore, enhance and maintain the chemical, physical, and biological integrity of the waters of the State, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial and other uses of water; and

9. Protect public safety through the proper design and operation of stormwater management basins.

Floodplains

Areas naturally susceptible to being inundated by flood waters from a stream, river, lake, ocean or other water body are called floodplains, or flood hazard areas. Floodplains encompass a floodway, which is the portion of a floodplain subject to high velocities of moving water including the normal stream channel, and the flood fringe, which includes lands outside the floodway that help to hold and carry excess water during a severe flooding event. Areas within the flood fringe do not usually experience high velocity flows.

The Federal Emergency Management Agency maps the floodplains on maps known as the Flood Insurance Rate Maps (FIRMs). FEMA categorizes floodplains on FIRMs into zones, which are geographic areas defined according to the level of flood risk, or the probability of flooding. The probability of flooding is computed based on historic river flows and flood events. At least ten years of data is required to calculate flood probabilities. Flood risk can be periodically recalculated to account for changes in flood trends in an area. However, because it looks at historic data, flood risk probabilities do not consider potential future shifts or increases in precipitation due to climate change.

In Chesterfield, the flood zones mapped on the FIRM include the A, AE, and X zones. Zones A and AE both designate areas that have a 1-percent chance of flooding in any given year. These zones are also often referred to as the 100-year floodplain and are called the Special Flood Hazard Area (SFHA) on the FIRM. The difference between Zone A and AE is that Zone A has not undergone detailed analysis and so the base flood elevation has not been calculated. Zone AE, on the other hand, has undergone detailed analysis in order to calculate the base flood elevation. Base Flood Elevation (BFE) is the height to which waters are expected to rise during a 100-year flood event.

Zone X designates areas that have a 0.2 percent chance of flooding in any given year. This zone is also known as the 500-year floodplain or as a Moderate Flood Hazard Area.

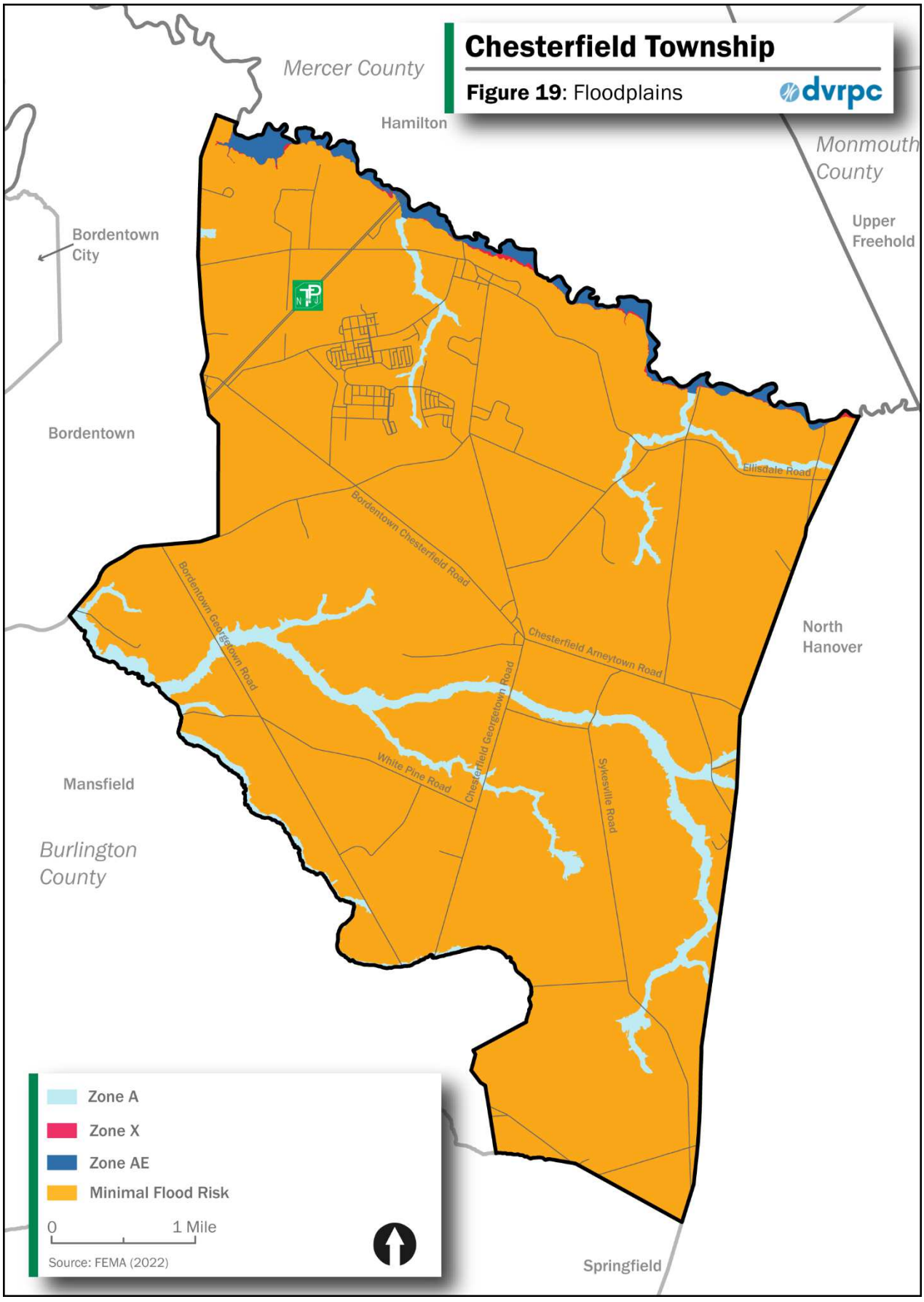
The extent of Chesterfield's flood zones is shown in **Figure 19** and the total land area of each zone is listed in **Table 14**.

These maps indicate that 917 acres, or 6.68 percent of the township's land area, falls within the 100-year floodplain (A Zone and AE Zone). An additional 17 acres, or 0.12 percent of the township's land area, falls within the 500-year floodplain (X Zone).

Table 14: Floodplain Area

Floodplain Zone	Acreage	Percentage
None	12,794	93.20
1 Percent/100-Year	917	6.68
0.2 Percent/500-Year	17	0.12
Total	**13,728**	**100.00**

Source: FEMA, 2010


Chesterfield Township
Figure 19: Floodplains
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
Zone A
Zone X
Zone AE
Minimal Flood Risk
0
1 Mile
Source: FEMA (2022)

Chesterfield's largest floodplain areas are located along Blacks Creek and its tributaries, Crosswicks Creek and its tributaries, and Bacons Run. Most of the land in these floodplains is undeveloped, being occupied by forests, wetlands, and farmland.

Floodplains require protection to prevent loss of or damage to property constructed on them. Equally important is the preservation of the aquatic communities that exist in floodplains. As food for many other species, these aquatic communities support the aquatic ecosystem as a whole. In addition, floodplains remove and mitigate various pollutants dissolved in stormwater, particularly fertilizer, when vegetation located within them absorbs the pollutants through their roots. The vegetation can also trap nutrients and sediments and prevent them from traveling farther downstream. All efforts to keep development out of floodplains will help to preserve the flood-carrying capacity of streams and their water quality.

New Jersey regulates construction in the flood hazard area under the Flood Hazard Area Control Act, N.J.S.A. 58:16A-50 et seq., and its implementing rules at N.J.A.C. 7:13. NJDEP adopted a Flood Hazard Control Act in 2007, which was amended in 2016, as well as on July 17, 2023. The most recent amendment raised the NJDEP 100-year design flood elevation (DFE) by two feet, accounting for observed and projected increases in rainfall. Full text of the revised Flood Hazard Area Control rules and other additional information on floodplain activities is available from NJDEP Division of Land Use Regulation and from its website under "Laws & Rules."

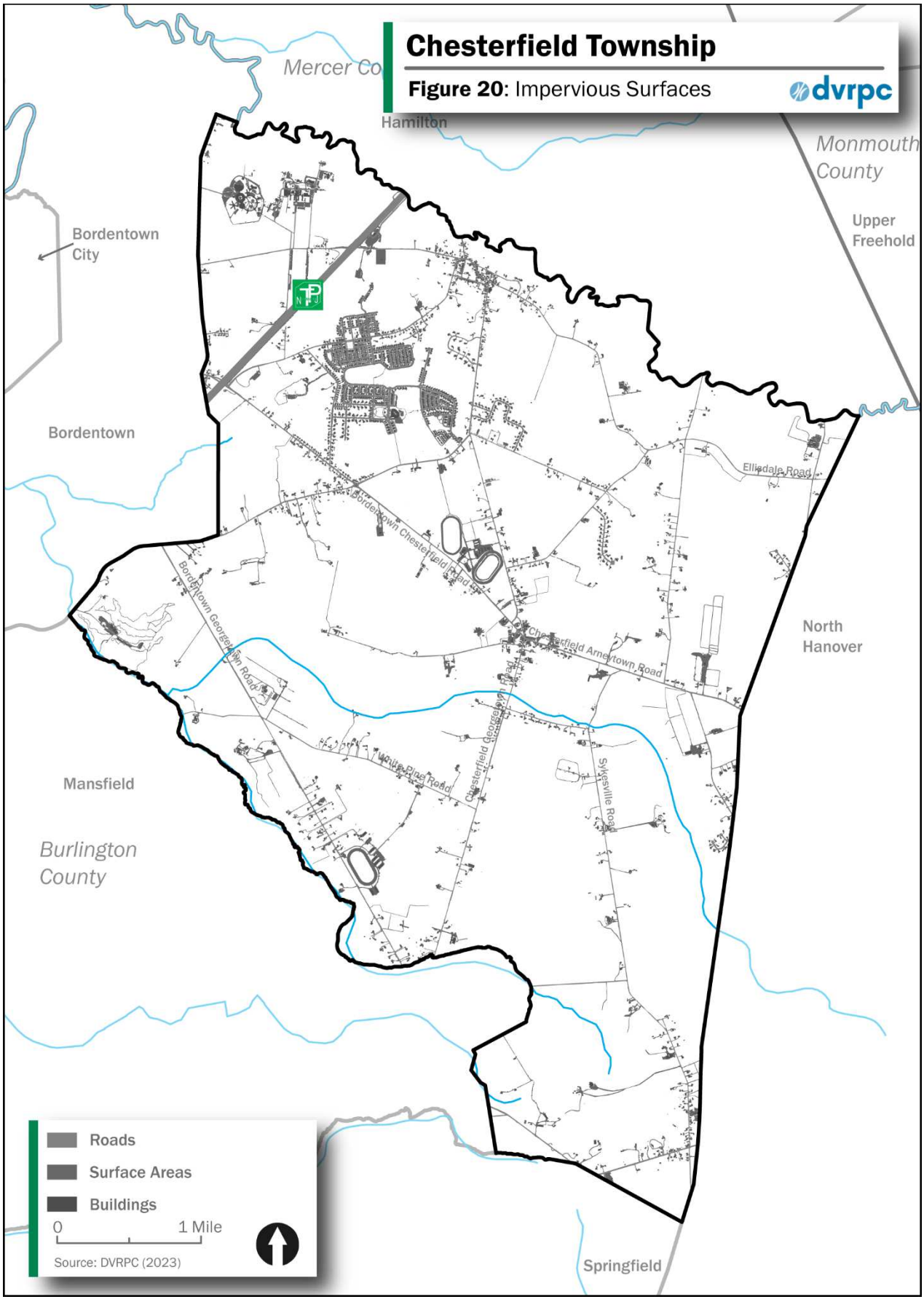
Development of Chesterfield's floodplains is managed through the Flood Control chapter in the township's municipal code. All development that is subject to review under the New Jersey Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.) or the New Jersey Uniform Construction Code (NJAC 5:23) must comply with the Flood Control chapter in Chesterfield's municipal code.

Impervious Coverage

Impervious surfaces are ground surfaces through which water is unable to filter into the ground. The amount of impervious surfaces in an area has a measurable impact on a range of environmental issues from stormwater to flooding to the urban heat island effect. As an area becomes more developed, greater volumes of stormwater flowing at higher speeds are directed from storm drains into streams, leading to water quality impairments. In general, scientists have found that levels of impervious cover of 10 percent or more in an urban area are directly linked to increased stormwater runoff, enlargement of stream channels, increased stream bank erosion, lower dry weather flows, higher stream temperatures, lower water quality, and declines in aquatic wildlife diversity. When Impervious cover reaches 25 percent to 30 percent within a subwatershed, streams can become severely degraded. Chesterfield contains 934 acres of impervious surfaces, which is 9.2 percent of the 10,150 dryland acres in the township (land not classified as water or wetlands).

Stream Buffers and Greenways

Vegetated stream buffers or riparian zones, as they are referred to in the NJ Flood Hazard Area Control Act regulations, can reduce the effects of stormwater runoff. Stream buffers are areas comprising a stream channel and the land immediately inland of the channel, and are effective at filtering substances that would otherwise be carried into streams by floods or stormwater by limiting the entrance of sediment, pollutants, and nutrients into the stream itself. The vegetation located within the buffer area traps sediment and it can absorb some of the nutrients in fertilizer that flows to the stream from lawns and farms.


Chesterfield Township
Figure 20: Impervious Surfaces
dvrpc
Mercer Co
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
White Pine Road
Chesterfield Georgetown Road
Sykesville Road
Roads
Surface Areas
Buildings
0
1 Mile
Source: DVRPC (2023)

When a stream buffer contains enough trees and large shrubs to create a strong root system and shade, this vegetation can stabilize the stream banks and control the stream's water temperature. The buffer can also serve as a green corridor or "greenway" that gives wildlife greater mobility between larger forested habitat areas, enabling animals to find food, shelter, or other resources. People can also use greenways for recreation. Their linear nature makes them well suited for jogging, walking, and biking trails. They can also be used for fishing or boat launching if they contain access points to the water. Access to waterways allows residents and visitors to experience them directly. Such experience has been shown to be helpful in cultivating more determined stewards and advocates for these waterways.

Aesthetically, stream buffers can preserve the pre-industrial or pre-suburban character of a community, providing a sense of "visual relief." Overall, stream buffers can enhance a community's quality of life, improve water quality, increase property values, provide tourism and recreation opportunities, and bolster the economic value of a community.

The importance of a healthy, intact stream buffer zone has been well documented scientifically over the past 50 years, especially for headwater streams. There is less agreement and continuing research on the best minimum width of a buffer for streams. In general, the wider the stream buffer, the more likely it will provide the township with the benefits described in the previous three paragraphs. In addition to the floodplain regulations discussed in the Floodplains subsection (page 67), New Jersey's Flood Hazard Area Control Act requires a 50-foot buffer around most streams, although municipalities can establish wider buffers.

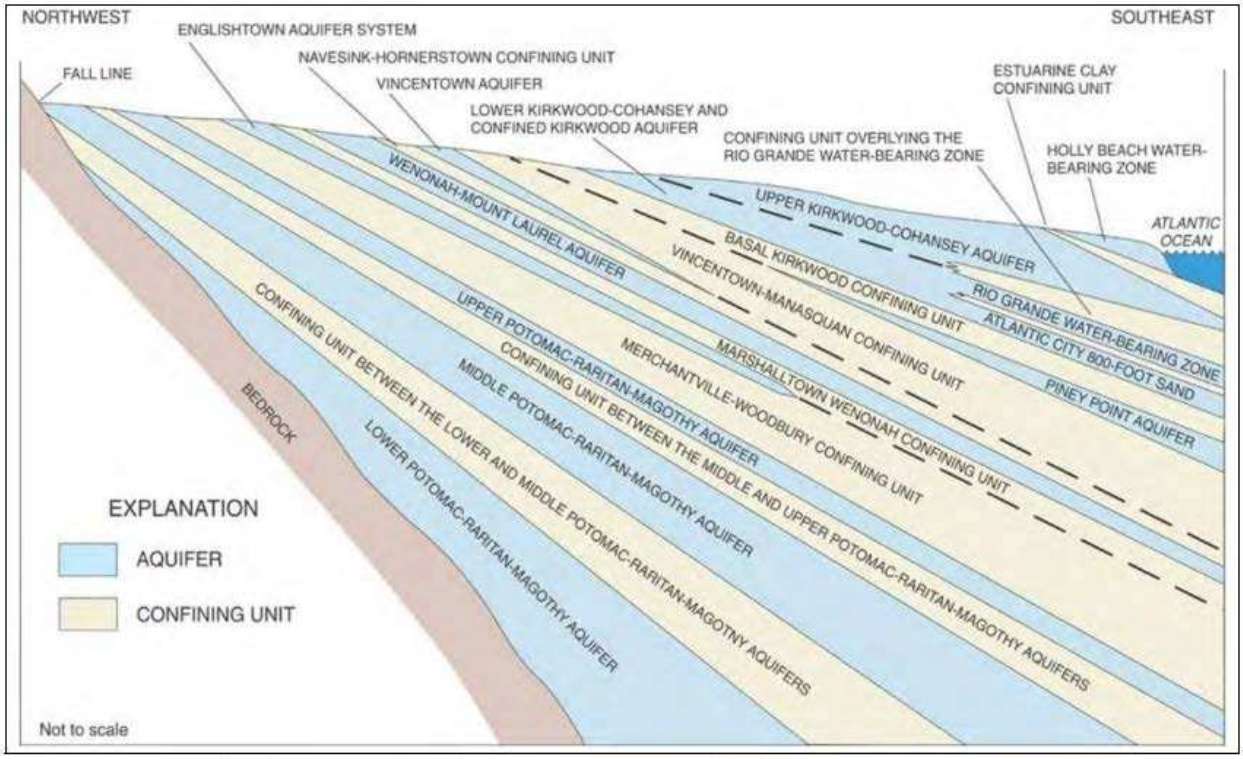
Groundwater

The geology of the New Jersey Coastal Plain can be visualized as a tilted layer cake, with its strata, or "layers," formed of gravels, sands, silts, and clays. The saturated gravel and sand layers, with their large pore spaces, are the aquifers from which water is drawn. The silt and clay layers, which impede the movement of water, are called confining beds.

A cross section across southern New Jersey from west to east would show that the aquifers are not horizontal but tilted toward the southeast, getting deeper as they cross the state toward the Atlantic Ocean. An example of this cross-section is depicted in **Figure 21** on page 73. Because of this tilting, each aquifer emerges on the land surface in a sequential manner. The deepest and oldest strata emerge on the surface near the Delaware River. Where each individual layer emerges is called its "outcrop" area. The Potomac-Raritan-Magothy formation, the deepest and most abundant aquifer, is a major water source for Inner Coastal Plain communities.

Other, smaller aquifers on top of the Potomac-Raritan-Magothy are the Woodbury, Englishtown, and Mount-Laurel-Wenonah. The two thick layers that overlie these older formations are the Kirkwood (lower) and Cohansey (upper), which are so similar to each other that they are usually given a combined, hyphenated name. All of these aquifers outcrop in portions of Chesterfield, traveling from west to east. See **Figure 12: Bedrock Geology**.

Figure 21: Cross-section of Aquifers in Southern New Jersey



Source: USGS, 2011

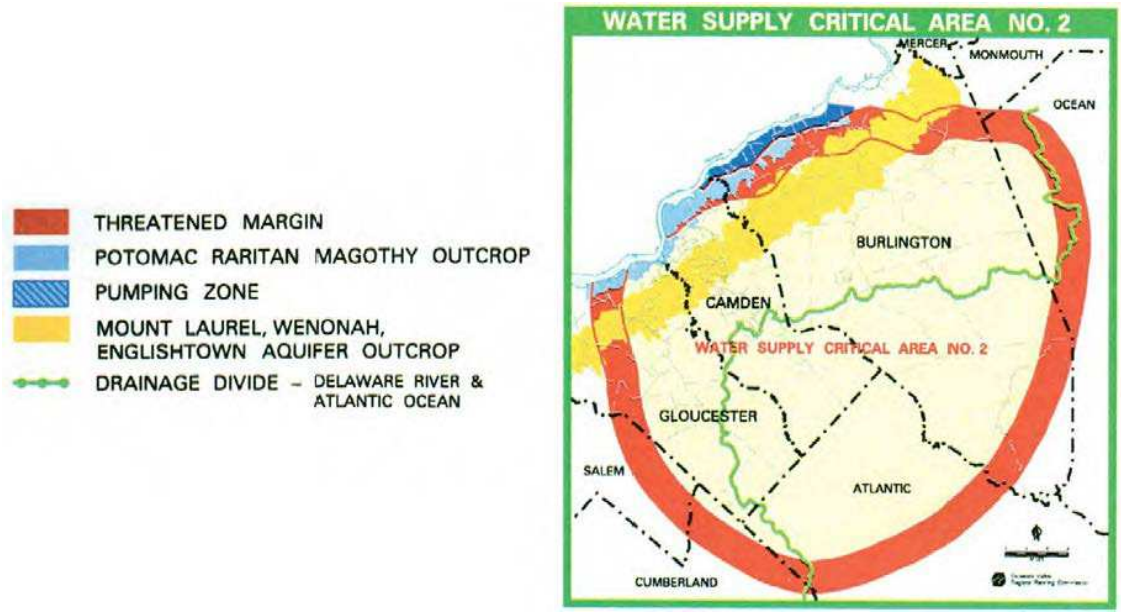
Aquifers and Confining Units

Potomac-Raritan-Magothy Aquifer

The Potomac-Raritan-Magothy aquifer is a principal geological formation underlying Chesterfield and likely a primary source of drinking water for the township (see **Drinking Water** on page 76). It has an outcrop area just to the west of Chesterfield along the Delaware River. The formation consists of three aquifers - lower, middle, and upper - divided by two confining units. The aquifers are largely made up of sands and gravels, locally interbedded with silt and clay. The lower aquifer sits on the bedrock surface. The confining units are composed primarily of very fine-grained silt and clay sediments that are less permeable and thus reduce the movement of water between the aquifers. They also help to slow the entry of any contaminants on the surface down into the groundwater.

The Potomac-Raritan-Magothy is the primary source of drinking water to New Jersey residents from Burlington to Salem counties. Because of this high usage, the levels of water in this aquifer declined to such low levels that NJDEP established the region as a water supply critical area (Critical Area Number 2) three decades ago. All water supply companies and authorities within this area have annual limits on water withdrawals from the Potomac-Raritan-Magothy aquifer. The northern and central portions of Chesterfield lie just outside Critical Area Number 2, while the southern portion lies within the Threatened Margin of the critical area.

Figure 22: **Extent of Water Supply Critical Area Number 2**



Source: DVRPC, 2004

Other Aquifers

There are other, smaller aquifers on top of the Potomac-Raritan-Magothy that have their outcrops in Chesterfield. These include, in order from west (closer to the Delaware River) to east (nearer the Atlantic Ocean) the Woodbury Formation, the Englishtown Formation, the Marshalltown Formation, the Mount-Laurel-Wenonah Formation, and the Kirkwood-Cohansey Formation.

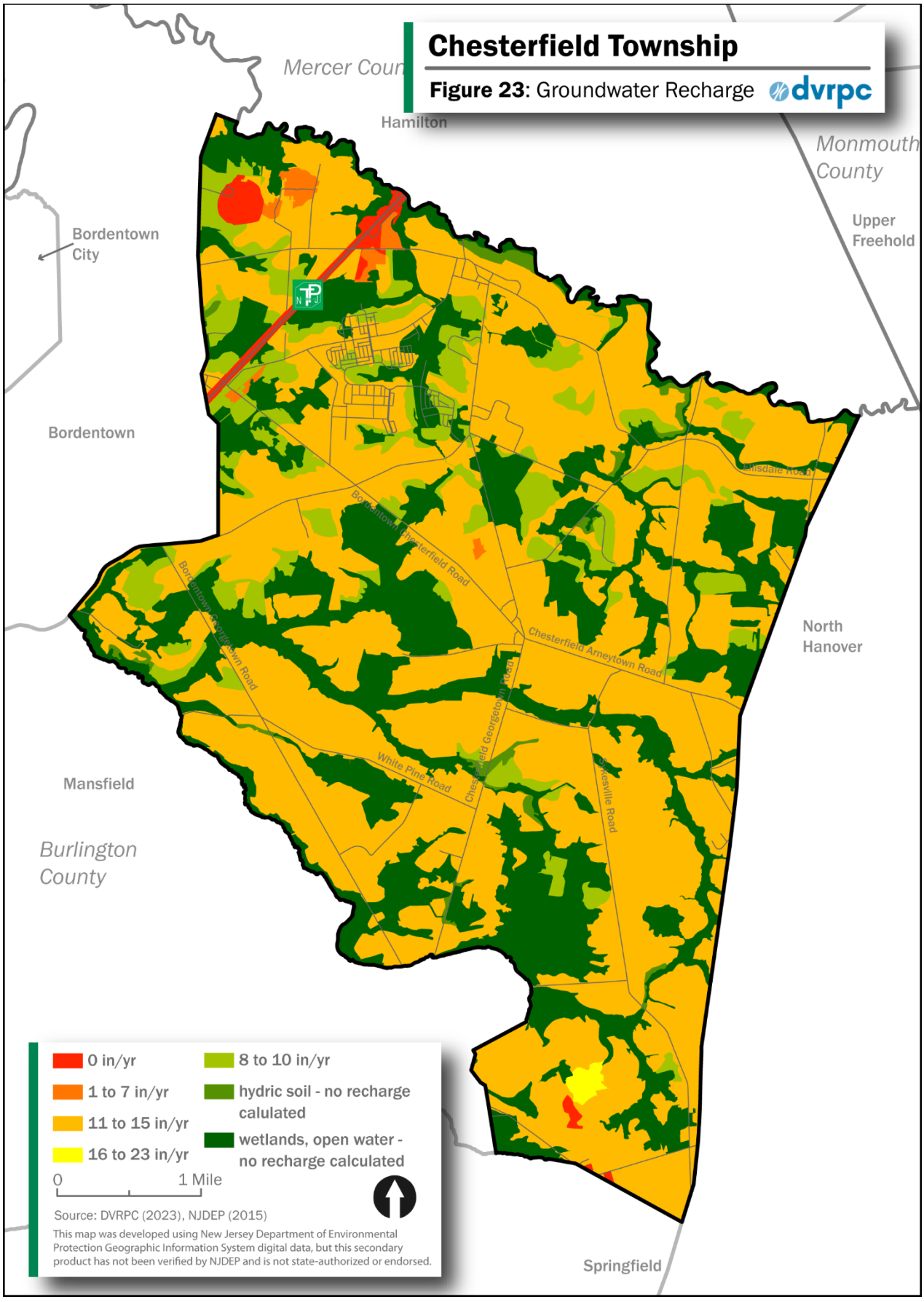
These aquifers are a significant source of drinking water to residents living to the east of Chesterfield. Because an outcrop is the area where the aquifer emerges on the land surface, preventing contamination of the land in outcrop areas is important in order to maintain a safe drinking water supply.

Groundwater Recharge

Recharge of groundwater is an important issue in south New Jersey because of the dependence on aquifers for drinking water supply and agricultural use. The amount of rainwater that actually enters an aquifer and reaches the saturated zone to become groundwater is a function of many factors, including the nature and structure of the aquifer itself, climatic conditions, the nature of the soil, and the vegetation of an area.

The New Jersey Geological Survey (NJGS) has developed a methodology for evaluating land areas for their ability to transmit water to the subsurface, using precipitation records, soil surveys, and land use/land cover data. NJDEP has used this methodology to map the groundwater recharge potential of land areas throughout the state. Recharge is equivalent to the amount of precipitation per year that could reach the water table in an area with a particular combination of soil and land use. It is expressed as inches per year.

The NJGS methodology is limited, as it only evaluates groundwater recharge potential, not aquifer recharge, and should be considered accordingly. Groundwater recharge potential differs from aquifer recharge, which the NJGS has defined as the recharge rate for those geological formations that yield economically significant quantities of water to wells.


Chesterfield Township
Figure 23: Groundwater Recharge
dvrpc
Mercer Coun
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
Chesterfield Georgetown Road
White Pine Road
Jobstown Road
0 in/yr
1 to 7 in/yr
11 to 15 in/yr
16 to 23 in/yr
8 to 10 in/yr
hydric soil - no recharge calulated
wetlands, open water - no recharge calculated
0
1 Mile
Source: DVRPC (2023), NJDEP (2015)
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.

In general, Chesterfield has good recharge potential with 59.5 percent of the township at moderately high recharge rates of between 11 to 15 inches per year. Just over one percent of the township is classified as having no recharge potential, 0.6 percent recharges 1 to 7 inches per year, and 8.9 percent at 8 to 10 inches per year. Only 0.2 percent of the township recharges at high rates of 16 to 23 inches per year. The remaining 29.5 percent are wetlands, open water, or hydric soil with no recharge calculated. This is shown in **Figure 23** on page 75**.**

In general, on high recharge lands, large amounts of paving and high impervious cover will have the most detrimental impact, although they are also usually the places that are most suitable for building because they are on well-drained soils. These are also regions where the dilution of substance from septic systems, such as nitrates, may require a larger land area because the soils are usually more “porous.”

While the surest way to protect groundwater recharge is to leave land undeveloped, there are ways in which urbanized areas can promote groundwater recharge. Best Management Practices (BMPs), such as tree trenches, bioswales, rain gardens, rain barrels, and porous pavement, can be used with great success to capture, treat, and infiltrate precipitation in developed areas from all but the most significant storm events. Also referred to as “green stormwater infrastructure,” these techniques are used in more developed communities to manage stormwater and protect drinking water supplies.

Chapter 10:

Drinking Water

Chesterfield residents on public water receive their drinking water from one private water-supply system: Aqua New Jersey. Aqua New Jersey serves 1,331 homes and businesses in Chesterfield, all of which are concentrated in the northwest corner of the township in and around Old York Village (the TDR receiving area). Aqua New Jersey draws their water to serve Chesterfield from deep groundwater wells extending to a depth of up to 2,000 feet. According to NJDEP databases, these wells are located in the Hamilton Square neighborhood of Hamilton Township. There are no public community water supply wells located within the boundary of Chesterfield. The Aqua NJ wells serving Chesterfield draw from some combination of the Potomac-Raritan-Magothy (PRM), Mount Laurel, and Englishtown aquifers, though most of the water is likely drawn from the PRM.

While there are no public *community* water supply wells in the township, Chesterfield is served by five public *noncommunity* water supply systems. Noncommunity water systems are public water supply wells serving institutions and businesses, as opposed to year-round residents, for at least 60 days of the year. These can include wells serving schools, factories, office buildings, rest stop areas, restaurants, motels. etc. However, since NJDEP no longer makes their data on public community or noncommunity water supply wells publicly available due to the sensitive nature of public water supplies, it is not possible to obtain up-to-date records on these systems. According to public records from the 2000s, updated with local knowledge, public noncommunity water supply systems operate at the following five locations: Chesterfield Inn, Meadow View Junior Academy, Country Pool Club, Townsend Machine, Inc., and the Chesterfield Township Public Works yard. One former location, the Old York Country Club, has since closed, and a former school served by a public noncommunity well is now the home of the Chesterfield Township Building, which is served by Aqua NJ.

The rest of the township's residential properties are served by private wells. Private wells can vary considerably in their depth due to age and other factors. Private wells in Chesterfield also draw on some combination of the PRM, Mount Laurel and Englishtown aquifers. Private well permits, which include additional data about individual wells, are held by NJDEP's Division of Water Supply and Geoscience and the Burlington County Health Department and but there are many gaps in these records due to various factors, including well age and changes in lot and block designation.

As required by state and federal regulations, most notably the 1974 federal Safe Drinking Water Act, the drinking water quality of all public water systems is regularly monitored for a variety of chemical and biological contaminants. Monitored chemical contaminants include inorganic compounds, radionuclides (i.e., radioactive compounds), and synthetic organic chemicals. The synthetic organic chemicals that are monitored include volatile organic chemicals (i.e., organic chemicals that readily become gaseous), pesticides, herbicides, and disinfection by-products. Biological contaminants that are monitored include coliform and Legionella bacteria, as well as parasites such as Giardia and Cryptosporidium. Turbidity (or cloudiness) is also tested. Lead and copper are also tested at a sample number of household taps. Drinking water utilities are required to notify their customers if the levels of any monitored chemicals exceed the regulated standards.

New Jersey Drinking Water Watch, a database run by NJDEP, displays a variety of information about public water systems operating in New Jersey, including basic information about the water system; testing results for the parameters that are required to be monitored through the Safe Drinking Water Act; violations; and other data.

Since 1997, the NJDEP Division of Water Supply and Geoscience has published reports within Drinking Water Watch summarizing violations of the Safe Drinking Water Act from public water systems statewide. The most recent data published online is from 2023. During this 26-year period, there were two instances of Maximum Contaminant Level violations for the Aqua NJ public water system serving Chesterfield Township: one in 2004 for Coliform and one in 2007 for Combined Radium. In both cases, compliance was achieved. The Maximum Contaminant Level is the national limit on contaminant level for a particular contaminant, as set by the EPA. All other eleven violations listed appear to be for late or incomplete reporting.

Private Well Testing Act

The 2002 New Jersey Private Well Testing Act (PWTA) requires state-certified laboratory water testing in order to sell a residential property. It also requires landlords to test the private well water supplied to their tenants every five years and provide their tenants with a written copy of the results. The data generated by these tests is provided to both the homeowners and the NJDEP Bureau of Safe Drinking Water. NJDEP uses the data to assess the quality of the water from private wells throughout the state. If the tests detect parameters in excess of the maximum contaminant level, the laboratory must notify various parties, including the homeowner, the local public health authority, and NJDEP. PWTA testing data gathered for wells located in Chesterfield is summarized in **Table 15: Private Well Testing Act Data**.

The PWTA does not require homeowners to treat private well water if an exceedance is identified. Furthermore, the secondary parameters that are tested–pH, iron, and manganese–have "recommended upper limits" rather than maximum contaminant levels, since the presence of secondary parameters will generally cause a nuisance rather than an acute public health threat. For example, well water with a high concentration of iron can have an orange tint and an unpleasant taste. Treatment of secondary parameters may be recommended, but not required, to make the well water more aesthetically pleasing. However, for the primary contaminants listed in **Table 15**—nitrates, gross alpha particles, mercury, volatile organic compounds, and fecal coliform—local health authorities may require the installation of treatment equipment. In some instances of an acute parameter exceeding standards, such as coliform or nitrates, the local health authority has the discretion to notify nearby homeowners and businesses.

Table 15: Private Well Testing Act Data

Parameter	Percentage of Wells that Exceeded the Maximum Contaminant Level	Number of Wells Tested under PWTA
Nitrate	1.3%	238
Arsenic	N/A	Less than 10 wells sampled
Iron	84.5%	238
Manganese	62.6%	238
Gross Alpha	1.3%	224
Mercury	0.0%	238
VOC	1.3%	238

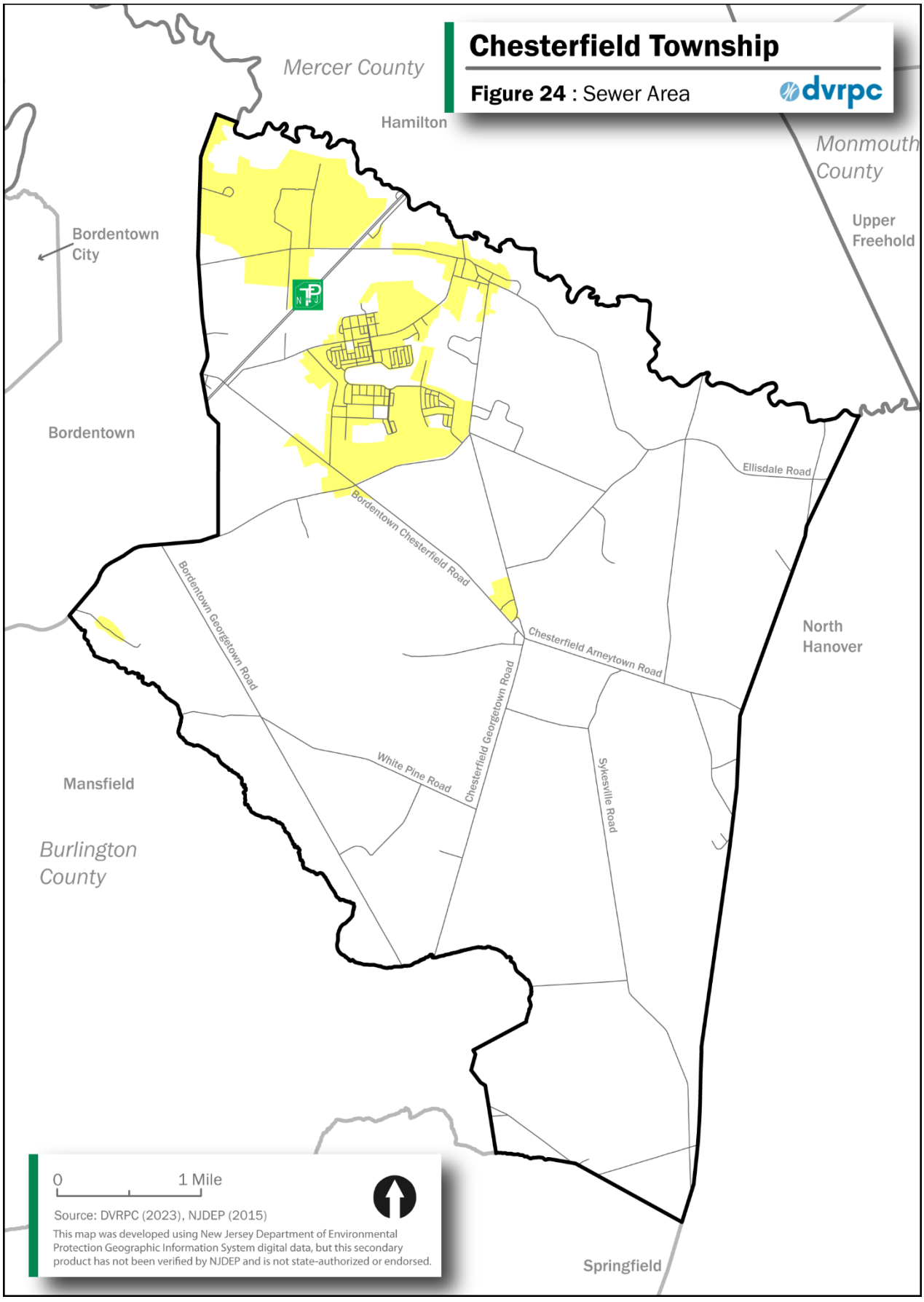
Parameter	Percentage of Wells that Exceeded the Maximum Contaminant Level	Number of Wells Tested under PWTA
Fecal coliform or E. Coli	1.7%	238
pH	28.6%	238

Source: NJDEP, 2022

Figure 24: Approved Sewer Service Areas shows the location of the currently approved sewer service areas in Chesterfield. While the approved sewer service area, concentrated in and around Old York Village in the northwestern portion of the township, is a small fraction of the township's total area, it encompasses a majority of the township's residents, as well as the Garden State Youth Correctional Institution. There is also a very small sewer service area in the western corner of the township that formerly served the Old York Country Club before it closed in 2021. A development firm, Active Acquisitions, is currently working to convert this property into a 1,134,000 square foot warehouse distribution center. These areas are served respectively by the Garden State Youth Correctional Institution Wastewater Treatment Facility and what was formerly known as the Old York Country Club Treatment Facility. To serve the proposed warehouse, the Old York Country Club Treatment Facility would need to be replaced and a new permit would need to be applied for and issued by NJDEP.

The Garden State Youth Correctional Wastewater Treatment Facility is owned by the New Jersey Department of Corrections and is permitted to process 1.3 million gallons a day 9 (MGD). From data starting in March of 2015, this facility processes 0.82 MGD on average, with the 20-year projection to 2035 at 0.895 MGD.

Before the closing of the club in 2021, the Old York Country Club Treatment Facility served the clubhouse, offices, maintenance building, and pool at the club. The permit for this facility allowed for a maximum of 0.0105 million gallons a day (MGD) of treated sewage to be discharged to groundwater per day. As stated above, this treatment plant would need to be replaced to serve the proposed warehouse facility.


Chesterfield Township
Figure 24 : Sewer Area
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
North Hanover
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
Mansfield
Burlington County
Springfield
0
1 Mile
Source: DVRPC (2023), NJDEP (2015)
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.

Chapter 11:

The Value of Biological Resources

When a community protects wildlife and habitat, it is also protecting biodiversity, which encompasses the variety of genetic material within a particular species population, the variety of species (plants, animals, microorganisms) within a community, and the variety of natural communities within a given region. Biodiversity allows species to adapt and evolve as their environments change, improving their chances for survival, as well as that of the biological communities of which they are a part. A diversity of plant and animal species is also necessary to maintain healthy human environments, agricultural productivity, and ecosystem health. Other types of organisms, including fungi and bacteria—many of which are not well known—contribute to nutrient cycling, decomposition of organic matter, soil rehabilitation, pest and disease regulation, pollination, and water filtering. Once biodiversity declines, it's extremely hard for an ecosystem to recover or replace species.

Scientists have discovered and named somewhere between 1.5 and 1.8 million plant and animal species, and there is an estimated 10 to 20 times that number unknown to science. Alarmingly, this great diversity of species is now diminishing at an unprecedented rate. Researchers generally agree that the extinction rate is now catastrophically high, somewhere between one thousand and ten thousand times the rate before human beings began to exert significant pressure on the environment. Given these trends, and barring significant increases in conservation efforts, approximately one-half of the world's species will be gone by the end of this century.

While the decline of biodiversity is indeed a global problem, conservation needs to occur on both global and local levels if it is to succeed. Chesterfield contains numerous types of natural habitats, all of which are important for maintaining biodiversity; the most common are deciduous wooded wetlands and deciduous forests, but many others are represented in the township. The following sections will identify and describe in more detail the plant and animal communities that inhabit these habitats within Chesterfield.

Chapter 12:

Natural Vegetation

A region's vegetation is dependent on many factors, the most important of which are climate and soils. Chesterfield's climate is temperate, with rainfall averaging 47 inches per year. The township contains both soils that are well-drained and support a large diversity of trees, brush, and agriculture, as well as poorly drained soils that sustain wetland plants.

Chesterfield's natural vegetation types, along with human-influenced types of land cover, have been tabulated and mapped most recently by NJDEP's 2020 land use/land cover analysis. Natural vegetation in the township, as tabulated and mapped in this analysis, is shown in **Table 16: Natural Vegetation** below and **Figure 25: Natural Vegetation**. Each land cover type, including its vegetation classification, is based on definitions provided by the Anderson Land Use Classification System, which was created by the USGS.

Table 16: Natural Vegetation (2020)

Type of Vegetation	Acres	Percentage of Total Land
Brush/Shrubland	59.69	0.43%
Brush/Shrubland (Mixed) - Oldfield	150.48	1.09%
Upland Forest - Coniferous	14.21	0.11%
Upland Forest - Deciduous	979.55	7.13%
Upland Forest - Mixed (Coniferous Dominate)	15.56	0.12%
Upland Forest - Mixed (Deciduous Dominate)	49.42	0.36%
Water	125.3	0.77%
Wetlands - Herbaceous	97.35	0.71%
Wetlands - Modified	959.94	6.99%
Wetlands - Scrub/Shrub	167.07	1.22%
Wetlands - Wooded - Deciduous	2,127.45	15.49%
Wetlands - Wooded - Mixed	12.27	0.11%
Wetlands (Modified)	105.07	0.75%

Source: NJDEP, 2020

Wetlands

As discussed previously in the Wetlands section of the **Hydrology and Water Resources** chapter, a wetland is, in basic terms, an area that has enough water at some time during the year to stress plants and animals that are not adapted to life in water or saturated soils. Wetlands are the second-most common land cover classification in Chesterfield, and the most common natural vegetation type in the township, comprising nearly 3,461 acres, or 25.2 percent, of the township's total area. Most wetlands in Chesterfield are deciduous

wooded wetlands, but the township also contains agricultural wetlands, herbaceous wetlands, modified wetlands, scrub/shrub wetlands, and coniferous and mixed wooded wetlands. In should be noted that while modified wetlands are included in the above table, they are classified as “modified” because they have been altered by human activities and do not support natural wetlands vegetation.

Wooded Wetlands

Wooded wetlands are dominated by deciduous trees within Chesterfield. There are 2,140 acres of wooded wetland land cover in the township.

The predominant wooded wetland canopy species may include red maple (Acer rubrum), tupelo (Nyssa sylvatica), green ash/red ash (Fraxinus pennsylvanica), black willow (Salix nigra), swamp white oak (Quercus bicolor), willow oak (Quercus phellos), southern red oak (Quercus falcata), American sweetgum (Liquidambar styraciflua), and American sycamore (Platanus occidentalis). These species combine to form a series of mixed hardwood lowland habitats throughout New Jersey. In Chesterfield, this habitat type is scattered around the southern half of the township, particularly along Blacks Creek near the center of the township and Bacons Run along the township’s southwestern border.

Scrub/Shrub Wetlands

Scrub/shrub wetlands are closely associated with wooded wetlands, and often make up transitional areas between deciduous wooded wetlands and other land cover types. They are located on 167 acres (15.6 percent) of Chesterfield’s land area. Typical native species in scrub/shrub wetlands in New Jersey include sweet pepperbush (Clethra alnifolia), buttonbush (Cephalanthus occidentalis), swamp rose (Rosa palustris), elderberry (Sambucus species), arrowwood viburnum (Viburnum dentatum), winterberry (Ilex verticillata), and silky dogwood (Cornus amomum). These wetlands are scattered around Chesterfield Township, most commonly in small concentrations along streams and waterways.

Upland Forests

Upland forests are the second-most abundant natural vegetation type in Chesterfield after wetlands, and the fourth-most common land cover classification in the township. Chesterfield’s upland forests are dominated by deciduous trees and do not have water at or near the soil surface. The majority of Chesterfield was covered with upland deciduous forest before human settlement, at which time residents began clearing forests for lumber and farmland. Today, most upland forests have been converted to agriculture or developed uses. Just over 1,269 acres (9.2 percent) of Chesterfield’s land area is currently composed of upland forests. Today’s upland forests are second or third growth. They are found throughout the township, although they tend to be located near stream corridors or as a buffer between residential areas and transportation or industrial land uses.

Deciduous Forest

Deciduous forest of various types comprises the majority of upland forest in Chesterfield at 980 acres. Some of the most recognizable trees in local deciduous forests are black oak (Quercus velutina), white oak (Quercus alba), chestnut oak (quercus prinus), mockernut hickory (Carya tomentosa), American sweetgum (Liquidambar styraciflua), American beech (Fagus grandifolia), and flowering dogwood (Cornus florida). The composition of the township’s upland deciduous forests is largely one of mixed oaks— black, red, and white oaks (Quercus velutina, Q. rubra, and Q. alba)—joined by other hardwoods such as birch (betula species), sycamore (Platanus occidentalis), beech (Fagus grandifolia), hickory (carya species), eastern black walnut (Juglans nigra), magnolia (magnolia virginiana), and locust (black locust, Robinia pseudoacacia; and honey locust, Gleditsia triancanthos). The understory is dominated by flowering dogwood, black cherry (Prunus

serotina), and sassafras (Sassafras albidum). Vines, such as wild grapes (vitis species), Virginia creeper (Parthenocissus quinquefolia), and poison ivy (Toxicodendron radicans), are common. Spicebush (Lindera benzoin), arrowwood viburnum (Viburnum dentatum), and black haw (Viburnum prunifolium) are common shrubs in moist locations.

Coniferous Forest

Coniferous forest land is located on just 14 acres in Chesterfield. Coniferous forests are typically composed of successional plant species and may include red cedar (Juniperus virginiana), white cedar (chamaecyparis thyoides), Virginia pine (Pinus virginiana), and pitch pine (Pinus rigida). They will most likely be overgrown over time by dominant deciduous trees, such as ash (fraxinus species), birch, oak, and hickory.

Mixed Forest

An additional 65 acres of forest consist of mixed deciduous and coniferous trees and represent an intermediate stage in forest succession. These areas are represented in the above table as either coniferous or deciduous dominate.

Grasslands (Brush/Shrubland)

Grasslands are considered to be one of the most endangered ecosystems globally. They are threatened by human development, new agricultural technology, grazing, desertification, soil erosion, and invasive species. Grasslands provide habitat for specialized species, such as grassland birds and shade-intolerant herbaceous plants that cannot live elsewhere. Many species of increasingly rare grassland birds require large contiguous patches of grassland for successful breeding and roosting.

NJDEP defines grassland habitat as brushland, shrubland, or old field that was cleared or disturbed at one time and then abandoned. Following abandonment, old field land cover is overgrown by perennial herbs and grasses. These pioneer plants remain the dominant species for three to 20 years. Later, woody plants take over in the process of habitat succession.

Grassland is often encountered along wood edges or roadsides, and in landscapes where mowing is infrequent and where woody plants are not yet the dominant vegetation. To be sustained, grasslands must be mowed every one or two years. Grasslands are also highly susceptible to invasive species.

Chesterfield contains 210 acres of brush/shrubland and old fields including 60 acres of deciduous or coniferous brush/shrubland, 52 acres of mixed deciduous and coniferous brush/shrubland and 98 acres of old field.

Rare Plant Species

According to the Natural Heritage Database, which includes NJDEP's maintained list of documented sightings of threatened and endangered plant species, three rare plant species have been observed in Chesterfield Township: Virginia bluebells, wand-like three-awn grass, and pale wild caraway, as well as one rare plant ecosystem: Floodplain Forest. As seen in **Table 17: Rare Plant Species** only Virginia Bluebells have recorded observations in recent years. Notably, the observation dates for wand-like three-awn grass and pale wild caraway, are from over 70 years ago, meaning these plants may no longer be extant in the township; the township does, however, still provide suitable habitat for these species.

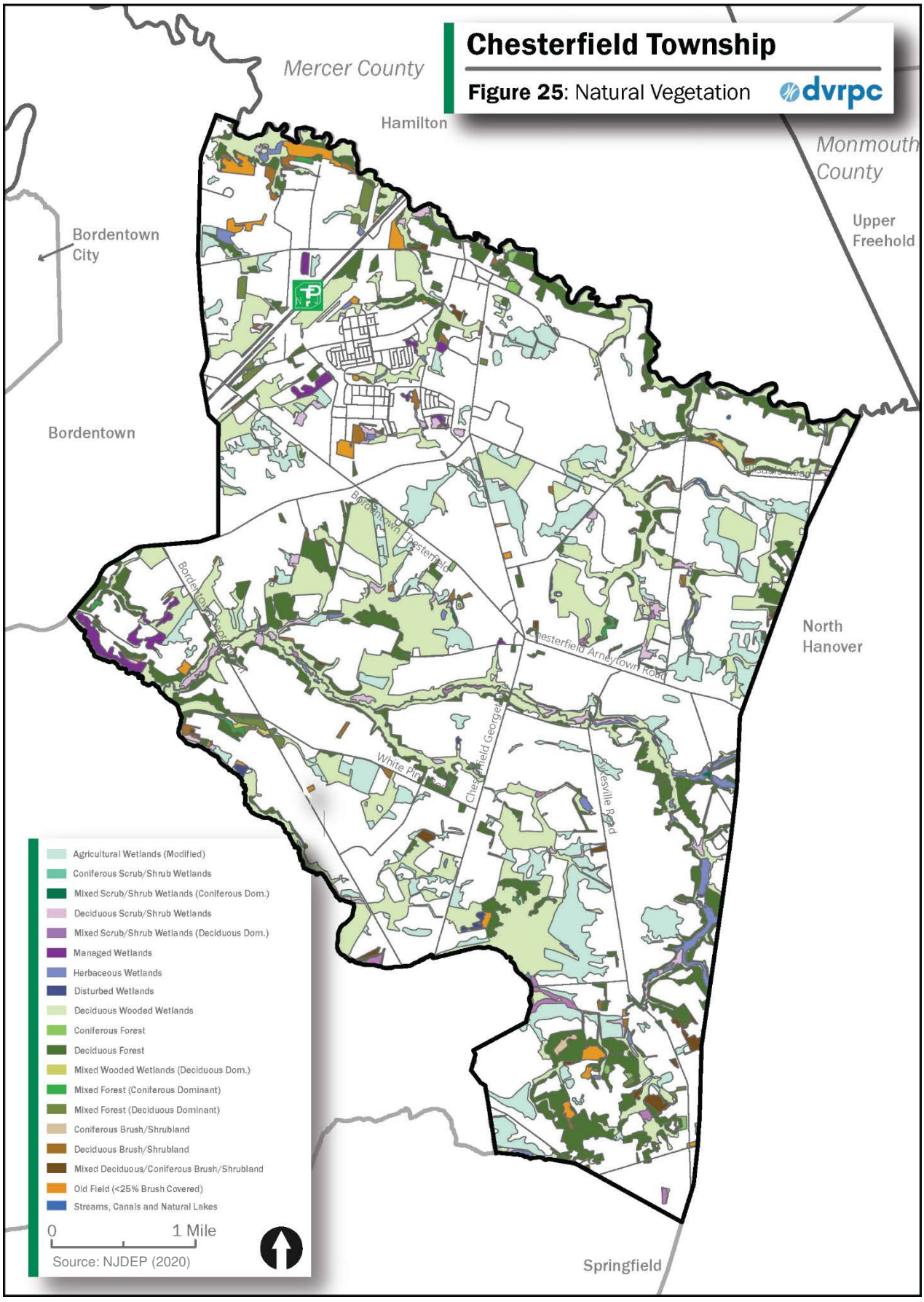

Chesterfield Township
Figure 25: Natural Vegetation
dvrpc
Mercer County
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Springfield
Bordentown Chesterfield
Bordentown Georgetown
Chesterfield Arneytown Road
Chesterfield Georgetown
White Pine
Sykesville Road
Agricultural Wetlands (Modified)
Coniferous Scrub/Shrub Wetlands
Mixed Scrub/Shrub Wetlands (Coniferous Dom.)
Deciduous Scrub/Shrub Wetlands
Mixed Scrub/Shrub Wetlands (Deciduous Dom.)
Managed Wetlands
Herbaceous Wetlands
Disturbed Wetlands
Deciduous Wooded Wetlands
Coniferous Forest
Deciduous Forest
Mixed Wooded Wetlands (Deciduous Dom.)
Mixed Forest (Coniferous Dominant)
Mixed Forest (Deciduous Dominant)
Coniferous Brush/Shrubland
Deciduous Brush/Shrubland
Mixed Deciduous/Coniferous Brush/Shrubland
Old Field (<25% Brush Covered)
Streams, Canals and Natural Lakes
0
1 Mile
Source: NJDEP (2020)

Table 17: Rare Plant Species

Common Name	Scientific Name	Federal Status	State Status	State Rank	Last Observed
Virginia bluebells	Mertensia virginica	N/A	N/A	S2	4/20/2011
Wand-like three-awn grass	Aristida virgata	N/A	N/A	S2	7/28/1949
Pale wild caraway	Arnoglossum atriplicifolium	N/A	E	S1	5/4/1950

Source: NJDEP, 2023

State Rank	
S1	Critically imperiled in New Jersey (5 or fewer occurrences observed)
S2	Imperiled in New Jersey (6-20 occurrences observed)
S3	Rare in state (21-100 occurrences)
S4	Apparently secure in state

Tree Cover

Old York Country Club Tree | Source: Chesterfield EC

According to OurTrees, a tree canopy assessment tool, Chesterfield's tree canopy cover is just under 27 percent of the township's land area, or 3,677 acres. Calculations performed by OurTrees show that this tree canopy sequesters just over 12,000 tons of CO_2 equivalent annually. This tree canopy cover is a bit below average for Burlington County, where tree canopy coverage as assessed by OurTrees ranges from over 63 percent in Washington Township to under 13 percent in Riverside Township, likely reflecting the amount of land cleared for agriculture in Chesterfield.

Chesterfield has been awarded "Tree City USA Certification" from the Arbor Day Foundation for 24 years in a row. The program, started in 1976, is meant to encourage and inspire maintenance, care and expansion of tree cover in communities. Participation requires thay communities maintain a tree board or department, have a community tree ordinance, spend at least $2 per capita on urban forestry, and celebrate Arbor Day. Today, the program includes 3.600 communities from all 50 states.

Chapter 13:

Landscape Project Priority Habitats

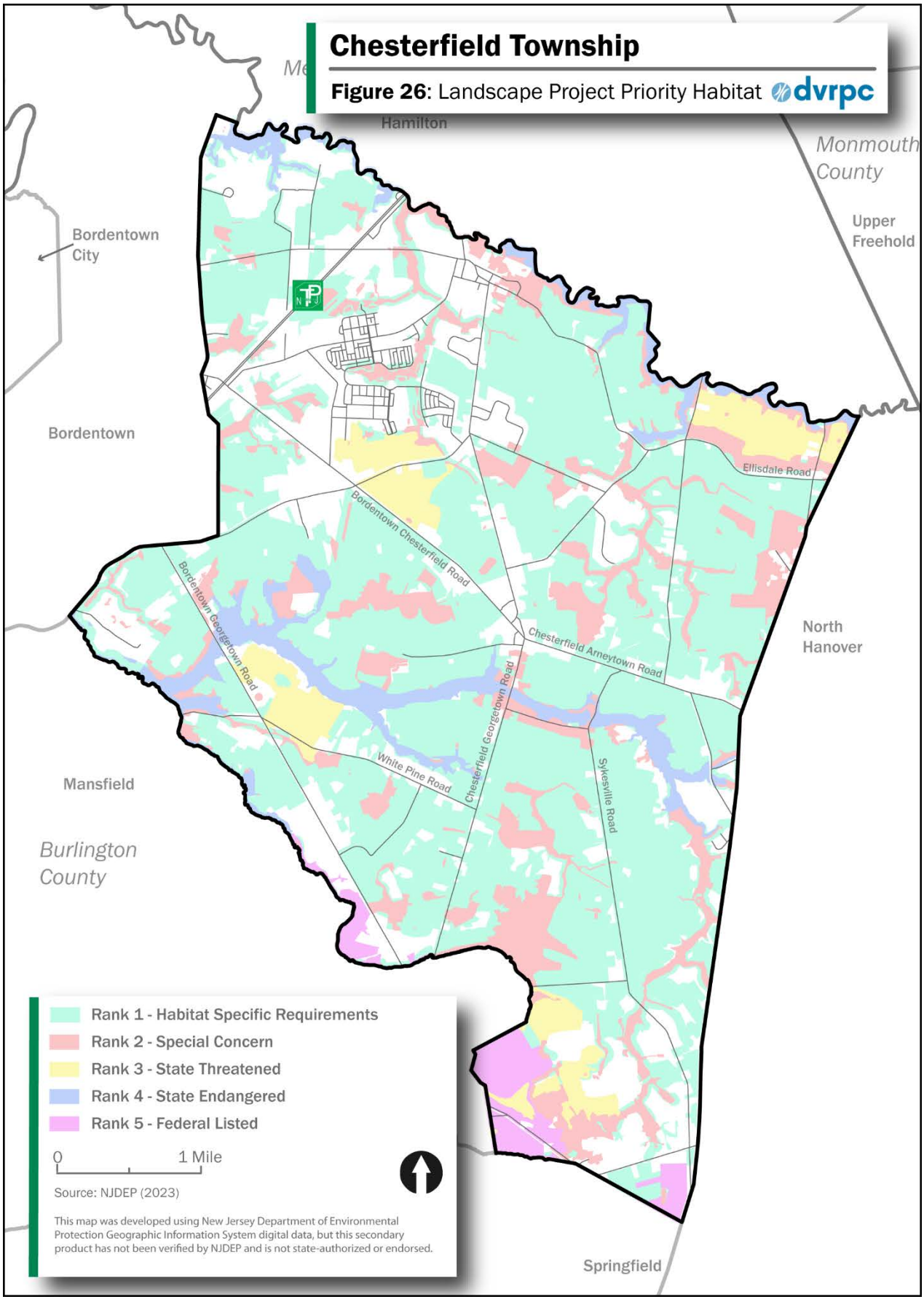
The Landscape Project, developed by the Endangered and Nongame Species Program of the NJDEP Division of Fish and Wildlife, is an interactive ecosystem-based mapping tool that categorizes wildlife habitats into one of five groups according to their importance, with Rank 5 being the highest. Ranks 3-5 include habitats that possess two exceptional conditions: (1) a documented occurrence of one or more species on the federal or state threatened and endangered species lists, and (2) a sufficient amount of habitat type to sustain these species. These habitats are collectively known as “critical habitat.” Ranks 1 and 2 include habitats that either have a documented occurrence of a Species of Special Concern in New Jersey, or are deemed suitable for species on the state or federal threatened and endangered species lists but for which there are no documented occurrences or sightings. These habitats are labeled “suitable habitats.”

The Landscape Project identifies both critical and suitable habitat for threatened and endangered species in Chesterfield, which is described in **Table 18: Landscape Project Priority Habitat** and shown in **Figure 26**: **Landscape Project Priority Habitat**. Almost all of the critical habitat (Ranks 3-5) is in the form of wetlands located in the riparian corridors adjacent to Bacons Run, Blacks Creek, and Crosswicks Creek. Preserving these habitats will help maintain the diversity of species that still exist in the township and improve the likelihood of survival for endangered and threatened species. Landscape Project areas in Chesterfield provide habitat for 13 rare animal species, which are described in the following sections on animals found in Chesterfield.

Table 18: Threatened and Endangered Species Habitat

Rank	Rank Description	Acres
1	Habitat Specific Requirements	11,836.34
2	Special Concern	2,970.92
3	State Threatened	1,142.77
4	State Endangered	1,315.80
5	Federal Listed	559.81

Source: NJDEP, 2023


Chesterfield Township
Figure 26: Landscape Project Priority Habitat
dvrpc
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Bordentown
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
North Hanover
Mansfield
Burlington County
Springfield
Rank 1 - Habitat Specific Requirements
Rank 2 - Special Concern
Rank 3 - State Threatened
Rank 4 - State Endangered
Rank 5 - Federal Listed
0
1 Mile
Source: NJDEP (2023)
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.

Chapter 14:

Animal Communities

Although no comprehensive inventory of the different animal species within Chesterfield exists, there are a variety of different types of records that can be pieced together. Using federal, state, scientific, and local sources, it is possible to identify and describe known and possible animals in Chesterfield and surrounding areas. New Jersey's Natural Heritage Program database, for example, lists threatened, endangered and rare species that have been documented or are likely to be present in the township, while local residents and organizations have documented a variety of more common animals known to reside in Chesterfield.

Invertebrates

Invertebrates are the basis of a healthy environment and are part of every food chain. They provide food for amphibians and fish and are part of the nutrient cycling systems that create and maintain fertile soils. Invertebrates consist of insects (beetles, butterflies, moths, dragonflies, ants, termites, bees, wasps, flies, and others), arachnids (spiders, ticks, and mites), crustaceans (crayfish, microscopic copepods), mollusks (mussels, clams, snails, and slugs), and worms.

Macroinvertebrates are invertebrates that are visible to the naked eye but are smaller than 50 millimeters. These communities consist largely of the juvenile stages of many insects, such as dragonflies and mayflies, as well as mollusks, crustaceans, and worms. Monitoring for diverse assemblages of macroinvertebrates reveals the effect of pollutants over a long period of time. NJDEP's AMNET program (see **Water Quality Monitoring Networks** on page 61) surveys streams for macroinvertebrate communities, which indicate water quality levels.

Rare Invertebrates

There are 10 invertebrate species listed as endangered in New Jersey: four butterfly species, three mussel species, two beetle species, and one dragonfly species. There are also 14 invertebrate species listed as threatened: six dragonfly species, five mussel species, and three butterfly species. While none of these species are present in Chesterfield, one invertebrate species, the pink streak (Dargida rubripennis), is listed as "rare" in the Natural Heritage Database for Chesterfield. The pink streak is a moth that occurs mainly in the mid-Atlantic, lower New England, and Midwestern states. It is rare in much of this range, including in New Jersey, though its numbers are believed to be increasing in the state's southern portion.

Before New Jersey communities were as heavily developed as they are today, freshwater mussels were abundant in the state's streams, including in Chesterfield. Due to the destruction of suitable aquatic habitats by dams and pollution, the native mussel population has sharply declined. Federal and state enforcement of the Clean Water Act and Endangered Species Act, stream encroachment rules, and local environmental reviews of proposed development projects can help protect existing populations.

Table 19: Rare Invertebrate Species

mmon Name	Scientific Name	Federal Status	State Status	State Rank	Last Observed
Pink Streak	Dargida rubripennis	N/A	N/A	S3: Rare in state (21-100 occurrences)	N/A

Source: NJDEP Natural Heritage Database, 2023

Vertebrates

Vertebrates are less numerous than invertebrates, but their larger size makes them much more visible and thus better studied and recorded. Fish, amphibians, reptiles, birds, and mammals are fairly well documented across the state.

Fish

New Jersey's waters are home to 85 species of freshwater fish. The NJDFW, under the Bureau of Freshwater Fisheries, monitors and actively aids the propagation, protection, and management of the state's freshwater fisheries. The Bureau also raises several million fish for stocking annually in over 250 water bodies located throughout the state and conducts research and management surveys.

Chesterfield's water bodies and wetlands provide habitat and food to freshwater fish. Like mussels, fish were once abundant along the Delaware River and its tributaries, such as the Crosswicks and Blacks creeks. Water quality degradation from urban development and agricultural practices, as well as dam construction, has caused most fish populations to decline. Nevertheless, a variety of fish species, including American eel, Atlantic butterfish, black sea bass, bluefish, bluegill, eastern silvery minnow, redbreast sunfish, Scup, shad, and summer flounder have been observed in Chesterfield's water bodies.

Accommodations supporting Chesterfield's fish population include a fish ladder on Black's Creek at Sykesville Road. (note: photo to be inserted).

Amphibians and Reptiles

New Jersey contains 71 species of amphibians and reptiles. This list includes 16 salamanders, 16 frogs and toads, 13 turtles, three lizards, and 23 snakes.

Amphibians, such as American bullfrogs are abundant. Other species, such as tiger salamanders, are less visible, but have been observed in the township. Some amphibians are rare, in part because they depend on vernal ponds, which typically form only on a seasonal basis. Amphibians may also be rare because they depend on high-quality waterways. There are three state-listed endangered amphibian species in New Jersey (two salamander species and one tree frog species) and three threatened species (two salamander species and one tree frog species). None of these species reside in Chesterfield.

Reptiles can also be quite elusive when surveys attempt to find and record them. Some notable examples of reptiles seen in Chesterfield include the corn snake and milk snake. There are also eight state-listed endangered reptile species in New Jersey (three snake species and five turtle species) and three state-listed threatened species (one snake and two turtle species). One of these, the bog turtle, a state-listed endangered species, may be present in Chesterfield.

Bog Turtles, which grow to about four inches in length, are one of the smallest turtles in North America. They have dark brown shells with brightly colored red, orange, or yellow spots on the sides of their head. They live in open, unpolluted emergent and scrub/shrub wetlands (i.e., non-wooded wetlands) in isolated areas ranging from South Carolina to upstate New York. Bog turtles depend on a diverse and specific set of micro-habitats within and along wetlands for foraging, nesting, basking, hibernating, and sheltering, and are therefore more susceptible to the loss, degradation, and fragmentation of their habitat from development than many other species. They are also threatened by collection for illegal wildlife trade. Bog turtles were listed as a federally threatened species in 1997. They have been extirpated (driven to local extinction) from much of New Jersey but have been observed within Chesterfield.

No known list exists of amphibians or reptiles that is focused only on Chesterfield. However, many of the species recorded by the NJDEP Division of Fish and Wildlife for New Jersey may be found in Chesterfield (see **Appendix A).**

Table 20: Rare Reptile Species

Common Name	Scientific Name	Federal Status	State Status	State Rank
Bog Turtle	Glyptemys muhlenbergii	Threatened	Endangered	S1: Critically imperiled in New Jersey (5 or fewer occurrences observed)

Source: NJDEP Natural Heritage Database, 2023

Birds

There are between 400 and 500 species of birds in New Jersey, which is an exceptional number given the state's small size. New Jersey is an important location for migratory birds heading south for the winter or further north to breeding grounds in the spring. Not only is the state an important rest stop for migrating birds, but the New Jersey Atlantic coast and the Delaware Bay are major parts of the Atlantic/Eastern Flyway, an established migratory air route in North America.

Common birds found in and around Chesterfield include waterfowl, jays, robins, doves, sparrows, woodpeckers, wrens, finches, herons, egrets, and some hawks.

Appendix A shows a list of 220 bird species observed/documented over the last seven decades at Bright View Farm in Chesterfield and six additional locations neighboring the township as reported by the Cornell Lab of Ornithology.

Rare Bird Species

There are 17 state-listed endangered bird species in New Jersey and 16 state-listed threatened species. Two state-listed endangered species, the bald eagle and the northern harrier, and one threatened bird species, the American kestrel, have recently been confirmed to exist in Chesterfield by residents. In addition, three bird species of special concern, the cooper's hawk, the great blue heron, and the wood thrush, are also known to be present within the township. The Natural Heritage Database also lists three threatened bird species possibly present in Chesterfield, the bobolink, the grasshopper sparrow, and the savannah sparrow, as well as two bird species of special concern, the eastern meadowlark, and the veery (**Table 21**: **Rare Bird Species**).

Table 21: Rare Bird Species

Common Name	Scientific Name	Federal Status	State Status	State Rank
American kestrel	Falco sparverius	Not listed	State Threatened	S2B,S2N
Bald eagle	Haliaeetus leucocephalus	Not listed	State Endangered	S1B,S2N
Bobolink	Dolichonyx oryzivorus	Not listed	State Threatened	S2B,S3N
Cooper's hawk	Accipiter cooperii	Not listed	Special Concern	S3B,S4N
Eastern meadowlark	Sturnella magna	Not listed	Special Concern	S3B,S3N
Grasshopper sparrow	Ammodramus savannarum	Not listed	State Threatened	S2B,S3N
Great blue heron	Ardea herodias	Not listed	Special Concern	S3B,S4N
Northern Harrier	Circus hudsonius	Not listed	State Endangered	S1B, S2N
Savannah sparrow	Passerculus sandwichensis	Not listed	State Threatened	S2B,S4N
Veery	Catharus fuscescens	Not listed	Special Concern	S3B,S4N
Wood thrush	Hylocichla mustelina	Not listed	Special Concern	S3B,S4N

Source: NJDEP Natural Heritage Database, 2023

State Rank	
S1	Critically imperiled in New Jersey (5 or fewer occurrences observed)
S2	Imperiled in New Jersey (6-20 occurrences observed)
S3	Rare in state (21-100 occurrences)
S4	Apparently secure in state
B	Population number refers to the breeding population of the bird in the state
N	Population number refers to the non-breeding population of the bird in the state

American Kestrel

American kestrels live in New Jersey year-round. These birds prefer grassland and open land, including pastures and parkland in developed areas, where they hunt insects, other invertebrates, small rodents, and birds. They nest in cavities, but cannot excavate on their own, and so rely on natural or human-made hollows, or cavity nests created by other birds. Courting pairs may exchange gifts of food; usually the male feeds the female. The American kestrel population has declined by about 50 percent between 1966 and 2015 primarily due to pesticides, which affect their food sources and hatching success, and clearing of nesting sites through development and farming.

Bald eagle

Bald Eagle in Chesterfield | Source: Chesterfield EC

Bald eagles can be found throughout the state year-round. They nest close to water, enabling them to hunt and eat fish and other aquatic species. According to the Conserve Wildlife Foundation of New Jersey, there are now 150 nesting pairs of eagles in the state after they were driven to the brink of extirpation in the 1970s from the effects of the pesticide DDT. Eagles are very sensitive to human disturbance and will abandon their nest sites if people encroach on the area during the nesting season. They also continue to be affected by chemicals and heavy metals in their environment.

Bobolink

The bobolink is a long-distance migrant that travels between North and South America—about 12,500 miles—every year. They breed in open areas, preferring large fields, and then move to freshwater marshes and coastal areas after breeding to prepare for migration. They eat seeds and insects in both of these habitats. Their population has declined 65 percent between 1966 and 2015, primarily due to conversion of meadows to other land cover. They are also killed or trapped along their migratory path for a variety of reasons, as people in different countries consider them pests, pets, or food sources.

Cooper’s hawk

Cooper’s hawks are year-round residents in New Jersey. Among the bird world’s most skillful fliers, cooper’s hawks are common woodland hawks that tear through cluttered tree canopies in high speed pursuit of other birds. You’re most likely to see one prowling above a forest edge or field using just a few stiff wingbeats followed by a glide. About the size of a crow, the cooper’s hawk has short, rounded wings and a long, narrow tail. The cooper's hawk remained a fairly common breeding species in New Jersey's forests until the 1950s when habitat loss caused population declines. Due to the reduction in the state’s breeding population and the loss of habitat, the cooper's hawk was listed as an endangered species in New Jersey in 1974. Following the nationwide ban of DDT in 1972 and the reforestation of fallow lands throughout the state, Cooper's hawk populations began to recover. Cooper’s hawks experienced increases in New Jersey Christmas Bird Counts from 1959 to 1988 and Breeding Bird Surveys from 1980 to 1999 (Sauer et al. 1996, Sauer et al. 2001). As a result, the status of the cooper's hawk was reclassified from endangered to threatened in New Jersey in 1999. The loss of large, contiguous forests remains a threat to this species and warrants the continued protection of cooper’s hawk nesting habitats.

Eastern meadowlark

Eastern meadowlarks are most common in native grasslands and prairies, but they also occur in pastures, hayfields, agricultural fields, airports, and other grassy areas. Because vast swaths of grasslands are hard to find in parts of eastern North America, Eastern meadowlarks will breed in many kinds of grassy areas as long as they can find about six acres in which to establish a territory. Eastern meadowlarks are listed as a Common Bird in Steep Decline. They are still too numerous or widely distributed to warrant Watch List status but have been experiencing troubling long-term declines. Losses are due to disappearing grassland habitat. Prairie is scarce in the eastern United States, and the kinds of farms that once hosted meadowlarks—small,

family farms with pastureland and grassy fields—are being replaced by larger, row-cropping agricultural operations or by development.

Grasshopper sparrow

Grasshopper sparrows breed in New Jersey and much of the mid-western and eastern U.S. This species lives in open grasslands and prairies, and primarily eats grasshoppers (which it paralyzes before eating), as well as other insects. Habitat loss, fragmentation, and degradation are the main causes of this sparrow's cumulative population decline of 75 percent between 1966 and 2014.

Great blue heron

The great blue heron (Ardea herodias), at 46 inches in length and with a wingspan of 72 inches, is the largest heron found in North America. This wading bird is found in a wide variety of aquatic habitats, including freshwater and saltwater marshes, lake edges, streams, and shorelines. The great blue heron feeds on aquatic reptiles, amphibians, and small fish. It nests in adjacent woodlands, in colonies of up to five hundred breeding pairs. While the non-breeding population is stable in New Jersey, breeding pairs have been identified as a species of special concern.

Savannah sparrow

As its name suggests, this sparrow species lives in various grasslands with few trees, including cultivated fields, grassy roadsides, and estuaries in coastal areas. They generally eat insects, which they stalk through grasses, but will eat seeds in winter. The population of this species has declined by 49 percent between 1966 and 2014, at first benefiting from the loss of forestland but then struggling from development and shifting agricultural practices from hayfields to row crops.

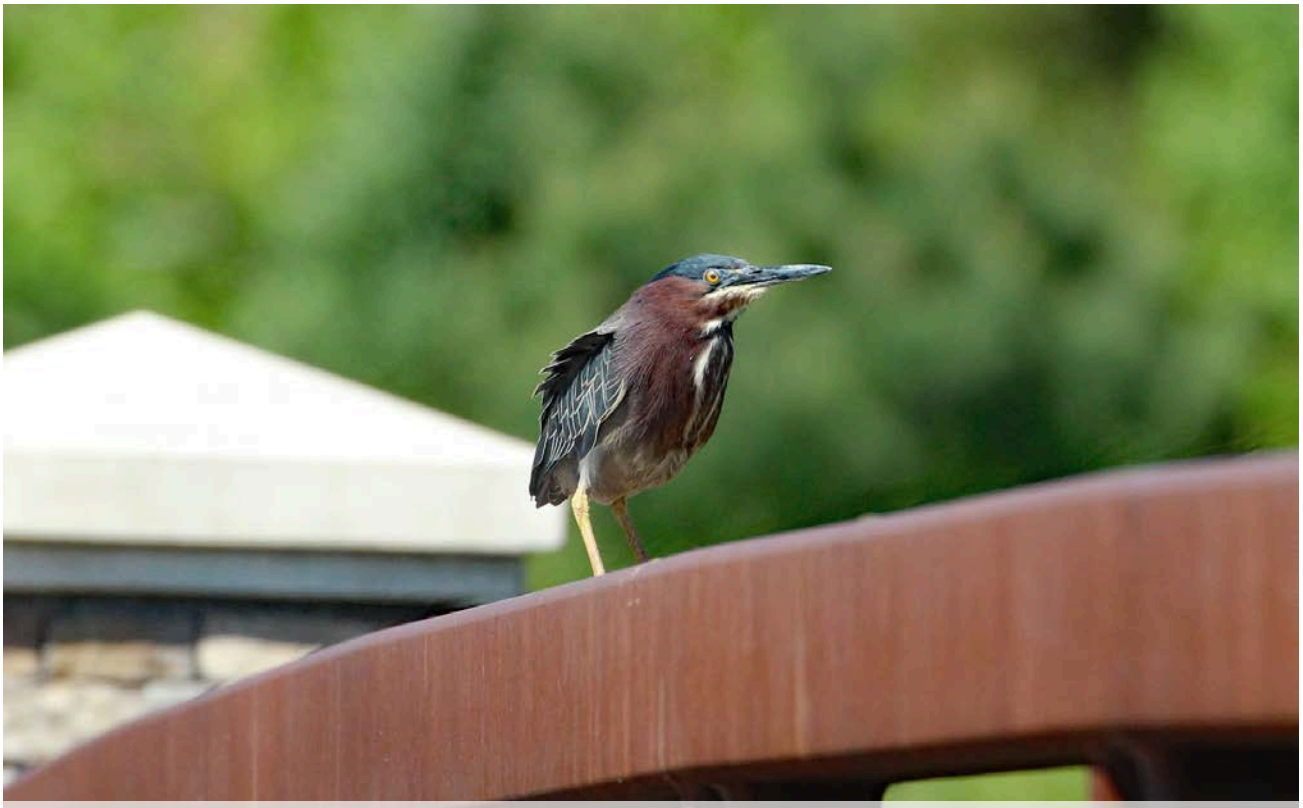
Veery

Chesterfield lies at the southern edge of the veery's breeding territory, and is also within their migratory path. Veeries breed in dense, damp, mostly deciduous woodlands, often near rivers, streams, and swampy areas. Breeding habitat includes forests of oak, maple, cherry, aspen, birch, alder, spruce and fir, among other trees and shrubs. Veeries gravitate toward disturbed forests, where dense understory provides protected nest sites. During spring and fall migration, they favor forest edges and second-growth woodlands. Though still common in northern woods, veeries have experienced slow, but significant declines over the last half-century. Overall, between 1966 and 2019, populations declined by approximately 0.6% per year for a cumulative decline of about 28%, according to the North American Breeding Bird Survey.

Wood thrush

Wood thrushes breed throughout mature deciduous and mixed forests in eastern North America, most commonly those with American beech, sweet gum, red maple, black gum, eastern hemlock, flowering dogwood, American hornbeam, oaks, or pines. They nest somewhat less successfully in fragmented forests and even suburban parks where there are enough large trees for a territory. Ideal habitat includes trees over 50 feet tall, a moderate understory of saplings and shrubs, an open floor with moist soil and decaying leaf litter, and water nearby. Favored understory species include southern arrowwood, smooth blackhaw, spicebush, coast pepperbush, rhododendron, and blueberry. The wood thrush is considered to be common throughout much of the eastern U.S. However, the species has undergone population declines in some portions of its range, including New Jersey, most likely due to habitat loss and forest fragmentation within its breeding range. The wood thrush is listed as a Species of Special Concern in New Jersey. Preservation of

large areas of intact habitat benefits this species since such areas enable them to breed and raise offspring more successfully.



Green Heron in Chesterfield | Source: Beth Ann Smith

Important Bird Areas

The Important Bird Area program is a global effort by the National Audubon Society to identify, promote, and conserve areas that are vital to birds and other species. Important Bird Areas are not regulated but are instead designated by Audubon chapters as high priority areas for conservation within their jurisdiction. The New Jersey Audubon Society has an expanded initiative called the Important Bird and Birding Area (IBBA) Program that identifies areas that provide essential habitat for sustaining bird populations as well as areas that provide exceptional opportunities for bird watching. The New Jersey IBBA program has identified 122 sites within the state.

The Upper Freehold Grasslands IBBA is 20,551 acres with approximately 1,167 acres within Chesterfield, including areas along the banks of Crosswicks Creek along the township's northern border, as well as a small area in the township's east. It is a state level priority area and contains diverse habitats such as grassland, agricultural land, deciduous forest, scrub–shrub, and riparian habitat. The area provides exceptional scrub-shrub habitat for the Northern bobwhite, field sparrow, Eastern wood-pewee, and American kestrel. Breeding grassland birds include the state-threatened bobolink, Eastern meadowlarks, grasshopper sparrows, and savannah sparrows. Rapidly expanding residential development, succession of fields to forest, and non-compatible agriculture practices threaten the habitats of the Upper Freehold Grasslands. Outreach to adjacent farmers and landowners and grassland restoration can help mitigate these impacts.

Canada Geese

The State of New Jersey now has a permanent resident Canada goose population of approximately 100,000 birds that no longer migrate to southern locales in the winter and more northern locales in the summer. There is also a migratory population of between 70,000 to 80,000 birds that spend part of the year in New Jersey. Although geese can provide enjoyable wildlife viewing opportunities, they can also cause property and environmental damage. Goose droppings that wash into lakes and ponds during storms can elevate coliform bacteria to unhealthy levels. Also, because geese can be quite aggressive during the nesting season, they can potentially injure humans.

Removing geese or preventing them from residing in park areas is a difficult task. Because geese move freely, the most effective management solutions are best conducted at the community level. Management techniques include allowing vegetation to grow around streams, lakes, and ponds to block waterfowl access; discouraging humans from feeding geese; and using fertility reduction techniques, such as egg addling or removal.

To address problems associated with geese inhabiting the stormwater basins in Old York Village, the Chesterfield Environmental Commission (EC) began researching methods to deter migrating and resident geese in 2019. The EC found that allowing vegetation to grow in a 15–20-foot buffer around the basins proved to be effective in other locations. In June of 2020, the EC worked with the Township Committee to establish a 'No Mow' zone around the basins. Follow-up monitoring by the EC showed that the goose population was effectively zero in October of 2021 (it was previously in the hundreds), and was also zero in most basins in September of 2022, except for the presence of a few disabled geese.

Mammals

Mammals are more easily documented than other species because they tend to be larger and live in habitats also ideal for human development. There are over 90 mammal species in New Jersey, including many that are common to Chesterfield: white tailed deer, cottontail rabbits, eastern gray squirrels, skunks, beavers, little brown bats, opossums, and raccoons. Chesterfield is also home to less frequently seen mammals in suburban-adjacent New Jersey communities such as coyotes, flying squirrels, mink, muskrats, and the occasional itinerant black bear or harbor seal.

Nine species of mammals are listed by the state as endangered and none are listed as threatened. Six of these are whales. The other three land-based species include the Indiana bat, the white-footed mouse, and the river otter. None of these endangered species are known to exist in Chesterfield.

Deer Management

White-tailed deer are one of the most prevalent and easily recognized wildlife species in New Jersey. While many residents prize the presence of mammalian life, deer can often be perceived as nuisances as a result of negative interactions with humans, particularly in more densely developed areas. According to the USDA, deer cause more damage to agricultural crops than any other vertebrate wildlife species, and farmers in densely human-populated areas appear to be the most affected. Additionally, deer can devastate the under-story of forests through overgrazing, destroying the growth of seedlings and young trees. Finally, as most motorists are well aware, collisions between deer and automobiles frequently result in 80 Biological Resources serious damage. To minimize human–deer conflicts, NJDFW designated 61 deer management zones throughout the state. Most of Chesterfield is located in deer management zone 17. Each zone treats its deer as individual populations with their own management objectives. The New Jersey Agricultural Experiment Station recommends both lethal and non-lethal deer management options for community-based

deer management programs. For example, municipalities can extend the hunting season, issue depredation permits to private landowners, engage in sharp shooting, and employ traps and euthanasia to reduce deer numbers. The main deer management technique used in Chesterfield is hunting.

In 2021, a significant outbreak of Epizootic Hemorrhagic Disease (EHD) occurred in the deer population in Chesterfield. EHD is a common viral disease in deer that is transmitted by biting midges in the genus Culiocoides. EHD outbreaks in New Jersey typically occur in August through October and end with the first hard frost, which kills the midges that carry and spread the disease. Symptoms of EHD in deer may include difficulty standing, drooling, lethargy, respiratory distress, foaming from the mouth or nose, and swelling of the face, tongue, and neck. While the exact population impacts were not quantified, anecdotal observations suggest a significant reduction in the size of the deer herd in Chesterfield due to the 2021 EHD outbreak.

Beaver Management

While the presence of beavers is welcomed by wildlife enthusiasts and most residents in New Jersey, beaver activity in more populated areas can become a nuisance. Beaver dams can result in ponding and localized flooding and beavers can damage and destroy trees. In Chesterfield, beavers were first noticed in Old York Village (OYV) in early 2018. A tributary from the Crosswicks Creek runs through OYV and the beavers apparently swam upstream using the tributary. One bank den was observed in a stormwater basin on Recklesstown Way. Other bank dens and dams were observed along the tributary. The Environmental Commission researched methods to deter activity and in 2018, wrapped many trees along the tributary with welded wire.

In 2019, the EC worked with the township Committee to prepare a Beaver Management Plan (BMP), so as to avoid the practice of hiring a trapper to kill the beavers. The Beaver Management Plan was adopted by the Committee in July of 2019. The Goal of the BMP was to cause the beaver to bypass OYV and continue south. Methods to deter beaver are primarily wrapping the trees with wire and applying latex paint with sand mixed in. Only one instance of beaver activity has been noted since 2019. Beaver activity is still found throughout other areas of the township, but their presence has no negative impact that the EC is aware of.

Chapter 15:

The Built Environment

Demographics and Population

Chesterfield's population has grown significantly since 2010. The 2010 census listed Chesterfield's population as 7,699 people. By 2020, the population had increased to 9,422, a 22.4 percent increase in 10 years. This was the 7th most rapid growth rate among New Jersey municipalities within the Greater Philadelphia metropolitan area during the 2010s.

Just under half (47.53 percent) of the population of Chesterfield categorized themselves as White (not Hispanic or Latino) in 2020 (see **Table 22**). Just under a quarter (23.28 percent) were Black or African American, almost 16 percent were Asian, 2 percent were multi-racial, close to 11 percent were Hispanic or Latino and just 34 residents (0.36 percent) identified as some other race.

Table 22: Chesterfield Population by Race, 2020

Ethnicity	Race	Population	Percent
Not Hispanic or Latino		8,417	89.33%
	White	4,478	47.53%
	Black or African American	2,193	23.28%
	Asian	1,505	15.97%
	Some Other Race	34	0.36%
	Two or More Races	191	2.03%
	American Indian and Alaska Native	16	0.17%
	Native Hawaiian and Other Pacific Islander	0	0.00%
Hispanic or Latino		1,005	10.67%
Total		**9,422**	

Source: US Census Bureau, 2020 Decennial Census

Housing

As of the 2020 U.S. Census, Chesterfield had a total of 2,008 housing units, of which 97 percent were occupied, and 3 percent were vacant. This is a 25 percent increase in the number of housing units since 2010, when there were 1,601 units, indicating that despite its successful land preservation policies, Chesterfield has accommodated a significant amount of residential growth in the past decade.

Trends in residential construction are reflected in **Figure 27**, which shows the number of housing permits issued each year from 2000 to 2022. The large wave of housing permits issued during the years before the

2008 recession is clearly visible. Given the lag in housing construction after permits are issued, most housing units were likely constructed some number of years after the permits were issued. The issuance of housing permits has remained significantly below the mid-2000s peak through 2022.

Figure 27: Chesterfield Housing Permits Issued by Year

Source: US Census Bureau, 2023 Building Permit Survey

Historic Resources

Protection and preservation of historic structures, lands, and views are of high importance to Chesterfield residents. The town boasts seven listings on both the National and State Registers of Historic Places, including the Crosswicks and Recklesstown Historic Districts, which have been designated on the National Register for nearly 50 years. The Recklesstown Historic District is located in the modern-day village of Chesterfield in the center of the township, around the intersection of the Crosswicks-Chesterfield, Georgetown-Chesterfield, Bordentown-Chesterfield, and Chesterfield-Arneytown roads. The Crosswicks Historic District is located in Crosswicks village in the northern part of the township, near the intersection of Ward Avenue, Church Street, and Buttonwood Street/Bordentown-Crosswicks Road.

The Recklesstown Historic District consists of the center of the modern-day village of Chesterfield. Notable historic buildings include the Chesterfield Inn, a two and a half story building with a main central rectangular block and symmetrical wings, built circa 1710 and altered in 1774; the Baptist Church, a one-story rectangular building with an entrance featuring Greek Doric columns, built circa 1848; the general store, circa 1846; and the Bullock Mansion, built in Victorian style circa 1876. A variety of other historic residential and commercial buildings from the 19th and 20th centuries remain in Recklesstown/Chesterfield.

The Crosswicks Historic District, located along the Crosswicks Creek in the northern part of Chesterfield, retains a variety of 18th and 19th century buildings of historical interest. These include the Friends First Day School and the neighboring Friends Meeting House, both constructed in Provincial Georgian style in the late 18th century; the J. P. Bunting House, constructed circa 1750; the Methodist Church, constructed in 1884; the Crosswicks Library, completed in 1922; and the Crosswicks Community House, completed in 1923. Like Recklesstown/Chesterfield, Crosswicks also retains a rich collection of other historic residential and commercial buildings.

Numerous additional sites were issued State Historic Preservation Office (SHPO) Opinions, which review a site's eligibility for inclusion on the State Register of Historic Places. In addition, one site, the Fernbrook Farm Historic District, has been issued a Certificate of Eligibility (COE) from the New Jersey State Historic Preservation Office. A COE satisfies a prerequisite to apply for funds from the New Jersey Historic Trust, as well as several county preservation funding programs.

There are various mechanisms to enhance historic preservation at the federal, state, and local levels. At the federal level, placing sites and districts on the National Register of Historic Places affords them added protection in the planning of federally assisted projects, and makes properties eligible for certain tax benefits and grant programs. It does not, however, prevent properties from being altered or demolished. To offer historic districts, sites and buildings additional protection, New Jersey municipalities are permitted to identify, designate, and regulate their own historic resources through the adoption of historic preservation ordinances (which are recognized as zoning laws under the New Jersey Municipal Land Use law).

Municipal Protection of Historic Resources

Chesterfield's Historic Preservation ordinance, enacted in 2016, established the Chesterfield Township Historic Preservation Commission, a seven-member board whose responsibilities include protecting and preserving the township's historic resources and sites, and creating community awareness and support for historic preservation. The Recklesstown and Crosswicks Historic Districts are protected as municipal historic districts under the provisions of the ordinance and by the authority of the Historic Preservation Commission. The Commission has five members and two alternates appointed by the mayor. The Historic Preservation Commission is advisory to the Planning Board, and all permits and development applications involving activities that affect a historic landmark or historic district, as well as improvements within a historic district, are reviewed by the Commission before the permit or application can be approved. The Commission is also responsible for designating additional buildings, structures, objects, sites and areas with historical significance as local historic landmarks or districts.

The Historic Preservation Commission, the Township Committee, and the Township Planning Board have adopted design guidelines for historic districts and sites in Chesterfield. The guidelines serve as a preservation and redevelopment management tool used to help retain the historic character of the Crosswicks and Chesterfield Historic Districts while permitting the districts to evolve. The guidelines summarize the application and review process to obtain a "Certificate of Appropriateness" for projects and improvement; present the historical and architectural character of the historic districts by identifying and categorizing the existing resources; outline the key provisions for the alteration and improvement of historic properties within the districts; make recommendations for appropriate maintenance practices; and provide resources for individuals, businesses, architects, designers, and the local historic commission members so that all involved are making consistent and objective decisions involving any development within the historic districts. The Design Guidelines are available on the Historic Preservation Commission's webpage.

The Chesterfield Township Historical Society is a private nonprofit organization devoted to discovering and collecting any material that may help to establish or illustrate the history of the township. The society provides for the preservation of these materials, making them accessible, and disseminating historical information and arousing interest in local history by publishing historical materials, holding meetings, marking historic buildings, sites, and trails, and using media to awaken public interest.

There are also federal incentives to individuals, organizations, or firms who own historic properties and are interested in historic preservation. For example, interested parties can take advantage of the Rehabilitation Investment Tax Credit, a federal tax incentive to encourage the preservation and reuse of older income-producing properties, including offices, apartment buildings, and retail stores.

Table 23: Sites Listed on the National and State Registers, Locally Designated Historic Districts, and Sites with SHPO Opinions

State ID	Name	Address/Location	Historic Listing(s)	Notes
5173	Bordentown Prison Farm Historic District	500 Ward Avenue	SHPO Opinion: 9/24/2014	A.k.a. Albert C. Wagner Youth Correctional Facility, Garden State Youth Correctional Facility
3552	Chapman-Peppler House	Chesterfield-Sykesville Road	SHPO Opinion: 11/10/1999	
776	Crosswicks Historic District	Chesterfield-Crosswicks Road and Front Street	NR: 5/3/1976 SR: 10/23/1975 Local historic District: 2016	
5518	Crosswicks Historic District Boundary Increase	33 Church Street	SHPO Opinion: 7/12/1983	ITS application for 1 property (Byrne Property)
3602	Farm Complex	120 Bordentown-Georgetown Road	SHPO Opinion: 2/8/1996	
5577	Fernbrook Farm Historic District	142-150 Bordentown-Georgetown Road	NR: 7/7/2022 SR: 5/16/2022 COE: 7/27/2017	
778	Holloway Farms Agricultural Preserve	Chesterfield-Georgetown Road	SR: 3/27/1981	
779	James Holloway/Charles B. Holloway Farm Complex	Newbold Lane	NR: 7/8/1982 SR: 3/27/1981	
3256	Iron Bridge Road Bridge	Iron Bridge Road over Crosswicks Creek	SHPO Opinion: 8/3/1990	Main Entry/Filed Location: Mercer County, Hamilton Township
780	William and Susannah Newbold House	Corner of Herman Black and Sykesville Roads	NR: 9/29/1980 SR: 2/1/1980	
781	Recklesstown Historic District	Georgetown-Chesterfield Road, Bordentown-Chesterfield Road to Crosswicks-Chesterfield Road	NR: 8/19/1975 SR: 5/8/1975 Local Historic District: 2016	NR Reference #: 75001125
782	Singleton-Lathem-Large House	Bordentown-Chesterfield Road	NR: 3/7/1979 SR: 4/15/1978	NR Reference #: 79001478
5278	Sycamore Farmstead	44 Old York Road	SHPO Opinion: 8/12/2013	
783	Taylor-Newbold House	Old York and Bordentown-Chesterfield Roads	NR: 11/18/1988 SR: 8/31/1987	NR Reference #: 87001815

Source: NJDEP Historic Preservation Office, 2023; Chesterfield Township, 2024

Historic Listing Designations	
NR	This site is listed on the National Register of Historic Places.
SR	This site is listed on the New Jersey Register of Historic Places (State Register).
DOE	This site has been issued a Determination of Eligibility by the National Park Service, formally certifying its eligibility for listing on the National Register.
COE	This site has been issued a Certification of Eligibility by the New Jersey State Historic Preservation Office, satisfying a prerequisite to apply for preservation funding from the New Jersey Historic Trust, as well as many county programs.
SHPO Opinion	This site has been issued an opinion of eligibility by the State Historic Preservation Office.

Source: NJDEP Historic Preservation Office, 2023

Trash/Recycling

Trash collection in Chesterfield Township is contracted on an individual basis by independent carriers including Garden State Removal, Waste Management, and Republic Services. These carriers accept both regular trash and bulk items, although there may be additional fees for the latter.

Burlington County provides free curbside collection of recyclable materials to Chesterfield residents every other week. Residents, tenants, landlords, businesses, and schools are required to recycle by township law.

Chesterfield also operates a township recycling center near the public works facility, offering cardboard, bottle, and can recycling; clothing recycling; medication disposal; plastic bag recycling; electronics recycling; and metal recycling. In addition, residents may dispose of tree branches, brush, and leaves in clearly marked areas at the Recycling Center. The township is currently examining expanding the variety of materials recyclable at the facility.

Energy

The primary energy sources in Chesterfield for residential and business uses are natural gas and electricity. Electricity in Chesterfield is provided by Public Service Enterprise Group (PSEG) and Jersey Central Power and Light (JCP&L). PSEG services most of the township, while JCP&L services the southernmost tip (roughly speaking, the areas south of Herman Black Road and Sykesville Road). PSEG is the only gas provider in Chesterfield; however, much of the township is not serviced and must contract with a provider for fuel oil, propane, or a similar fuel.

Under New Jersey's energy deregulation law, customers may choose from a variety of third-party suppliers. If a customer chooses to purchase power from a third-party supplier, their power is still delivered through PSEG or JCP&L's wires and pipes.

The state of New Jersey released its most recent Energy Master Plan in 2019. The plan has the goals of putting the state on the path of 100% clean energy by 2050 and reducing greenhouse gas emissions by 80% below 2006 levels. Key strategies of the plan include reducing energy consumption and emissions from the transportation and building sectors, accelerating deployment of renewable energy and distributed energy resources, and supporting community energy planning and action in underserved communities. More information on the Energy Master Plan can be found at nj.gov/emp.

DVRPC released its latest Regional Greenhouse Gas (GHG) Emissions Inventory in November, 2018, which shows emissions data for the year 2015. The report inventoried emissions in the form of metric tons of CO2 equivalent units (MTCO2E) for all 352 municipalities located within DVRPC's nine-county region, including Chesterfield. The report examined GHG emissions from stationary energy consumption (heating one's home or lighting schools, for example), mobile energy consumption (transportation-related emissions), and non-energy-related emissions (agricultural methane, land cover change, etc.). Eighty-four percent of the region's total GHG emissions were allocated to the municipal level by DVRPC.

The report reveals that the township consumed 937 Billion British Thermal Units (BBtus) of energy in a year. A British Thermal Unit (Btu) is the amount of energy needed to cool or heat one pound of water by one degree Fahrenheit. A gallon of gasoline contains about 116,000 BTUs, so Chesterfield's total energy use in 2015 was equivalent to about 8 million gallons of gasoline. The township performed average in comparison with other municipalities in terms of energy use per capita (including in-town residents and workers, with each resident contributing the equivalent of over 9 metric tons of CO2 to the atmosphere per year, compared to just over 10 per resident for Burlington County as a whole. Total positive emissions for the township are 77,033 MTCO2E.

Energy use is calculated by tabulating energy consumption across the commercial, industrial, and residential sectors, along with mobile (i.e., vehicle) energy consumption. Stationary energy consumption accounts for the bulk of the township's emissions (69.42 percent), with commercial uses accounting for approximately twice the emissions of residential uses. Mobile energy consumption accounts for roughly 23 percent of emission, and the remaining 8 percent are accounted for by non-energy-related activities, primarily agriculture and the disposal of waste (emissions attributable to landfilling).

Energy expenditures were highest for the commercial and industrial sector as well at $8.7 million, or approximately 46% of the total energy expenditures. Natural gas was the primary source of energy with 51 percent of the BBTU's supplied.

In addition, almost 6,000 metric tons of CO2E were sequestered by the township's forests and urban/suburban tree canopy, resulting in net positive emission of just over 71,000 MTCO2E for the township as whole. Trees are especially effective natural carbon sinks, taking in atmospheric CO2 through transpiration and converting it to biomass. Areas that undergo forest growth due to succession from abandoned agricultural fields or concerted tree-planting efforts result in a net decline in atmospheric carbon emissions. Carbon sequestration due to tree growth, or emissions due to forest clearing, are captured within the category referred to as land use, land use change, and forestry (LULUCF). **Table 24** provides a detailed breakdown of Chesterfield's GHG emissions by source.

Table 24: Chesterfield Greenhouse Gas Emissions by Source

Category	Emissions Source	Total Emissions (MTCO2)	Percent of Positive Emissions I	Per Capita (MTCO2)
Stationary Energy	Residential	18,392	23.86%	2.43
	Non-Residential	35,086	45.55%	4.63
	Subtotal	**53,478**	**69.41%**	**7.06**
Mobile Energy	**Subtotal**	**17,563**	**22.80%**	**2.32**
Non-Energy	Agriculture	2,384	3.09%	0.31
	Waste	2,752	3.57%	0.36
	Wastewater	232	0.30%	0.03
	Industrial Processes	-	-	-
	Fugitive Methane	623	0.81%	0.08
	Subtotal	**5,991**	**7.78%**	**0.78**
Total Positive Emissions		**77,033**	**100.00%**	**10.16**
Sequestration	LULUCF	-5,948		-0.77
Total Net Emissions		**71,085**	**100.00%**	**9.39**

Source: DVRPC (2018)

Parks and Open Space

Chesterfield contains approximately 145 acres of parks and township-owned open space, all of which are owned and maintained by the township. The township's park system provides a variety of active and passive recreational opportunities for area residents. Active recreation includes activities such as soccer, baseball, volleyball, frisbee, and playground activities. Facilities such as jungle gyms, swing sets, tennis courts, and sports fields are typically required for active recreational pursuits. Passive recreation encompasses most other park activities including walking, fishing, birdwatching, bike riding, and picnicking. Typically, these activities can take place in natural open space settings.

Several major parks in Chesterfield provide space for active and passive recreation. Charlotte Rogers Park, located near the intersection of Crosswicks Chesterfield Road and Margerum Road, provides fields for soccer and baseball as well as a walking path. The land for the park was donated by Max Zaitz, a local landowner, cattle dealer, farmer, and philanthropist. The park is named after his third-grade teacher from 1912, Charlotte Rogers. Fenton Lane Park includes facilities for soccer, baseball, softball, tennis, and pickleball, a field house for basketball, yoga, badminton, and volleyball, as well as a dog park, in addition to hosting sports clinics.

Chesterfield Park in Chesterfield Village includes a playground and walking path as well as facilities for tennis, pickleball, lacrosse, and volleyball. Many of these parks have received funding through the Green Acres Assistance program or are listed on a Green Acres-approved Recreation and Open Space Inventory (ROSI), and as a result they are "Green Acres encumbered". Green Acres encumbrance comes with a variety of restrictions on the use of these lands, but most importantly, they can only be used for recreation and conservation purposes, and the disposal or diversion of parkland for any purpose, including other public purposes, cannot happen without approval from NJDEP.

Charlotte Rogers Park | Source: Chesterfield EC

Other recreational facilities in Chesterfield include Margerum Road Wildlife Park, which provides space for passive recreation such as wildlife viewing. There is also a large open space at Chesterfield Elementary School, which provides areas for both active and passive recreational space to the public, including basketball courts and fields used for cricket. Several smaller pocket parks are scattered throughout the township as well.

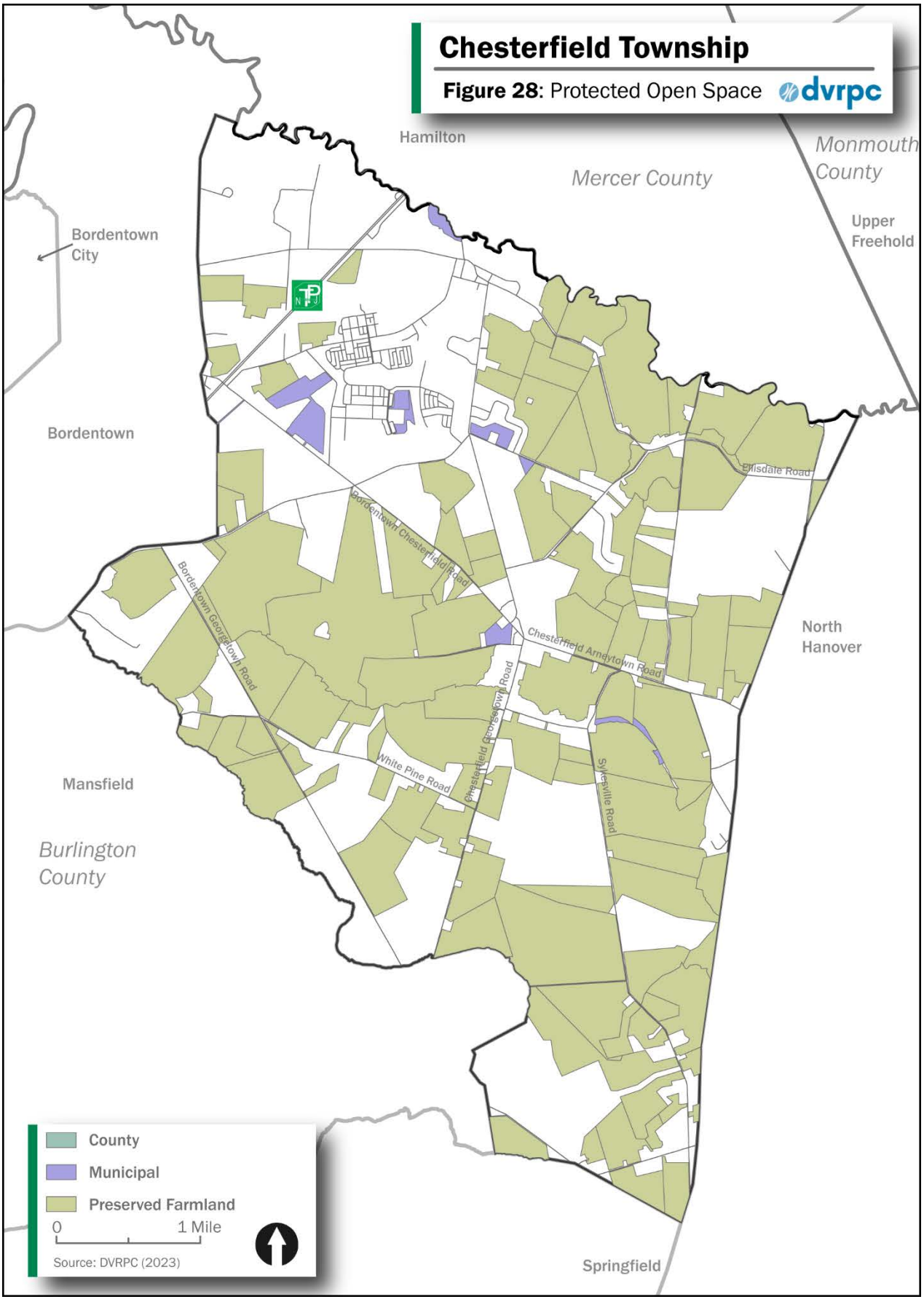
Burlington County approved a Parks and Open Space Master Plan in 2002, which called for the creation of a county parks system that expands public access to diverse, passive recreational facilities; aggressive protection the county's significant natural resources; preservation of the culture and heritage of Burlington County; and coordination of park system development and open space preservation with compatible growth, preservation, and recreation initiatives.

Chesterfield contains within its boundaries about 8,131 acres of preserved open space, 7,986 acres of which is accounted for by privately-owned preserved farmland protected through easements and the sale of TDR credits. The remaining 145 acres are publicly-owned open space, which includes the natural areas and playing fields noted above (see **Table 25**: Protected/Public Open Space and Preserved Farmland and **Figure 36:** Protected Open Space and Preserved Farmland).

Table 25: Protected/Public Open Space and Preserved Farmland

Ownership	Acres
Burlington County	0.68
Chesterfield Township-Owned Open Space	144.98
County Easement/Fee Simple Preserved Farmland	4,912.75
SADC Easement/Fee Simple Preserved Farmland	208.16
Farmland Preserved through TDR Credit Sales	2,865.00
Total	8,131,57

Sources: Burlington County Comprehensive Farmland Preservation Plan (2022 Update), DVRPC (2022)


Chesterfield Township
Figure 28: Protected Open Space
dvrpc
Hamilton
Monmouth County
Mercer County
Upper Freehold
Bordentown City
Bordentown
North Hanover
Mansfield
Burlington County
Springfield
Elisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
County
Municipal
Preserved Farmland
0
1 Mile
Source: DVRPC (2023)

Farmland Preservation

With rich soils and easy access to markets, Chesterfield had historically been a largely agricultural township. To protect this character and the agricultural industry from growing residential and commercial development pressures, Chesterfield leaders and community members have made farmland preservation a local policy priority dating back at least to the 1970s. Since that time, farmland preservation in Chesterfield has occurred through two primary mechanisms: the purchase of preservation easements by county and state agricultural preservation programs, and through a transfer of development rights (TDR) program adopted by Chesterfield in 1997. With regard to TDR, Chesterfield is somewhat unique in that it is one of only two municipal-based TDR programs to have been established in the state, the other being in Lumberton Township. As of late 2022, Chesterfield had preserved almost 8,000 acres of farmland, or over half of the township's total land area, making it one of the most successful farmland preservation efforts across New Jersey.

TDR Program

Chesterfield's TDR program (see definition box to the right) is one of the primary vehicles responsible for permanently preserving Chesterfield's farms and open space. Chesterfield established its TDR program in 1997 following the adoption of the Burlington County Transfer of Development Rights Demonstration Act by the State Legislature in 1989. The purpose of that act was to permit Burlington County to serve as a pilot project for the State in the creation and implementation of TDR. Under the Act, municipalities in Burlington County were authorized to establish TDR programs through the adoption of a local ordinance. Chesterfield's program was thus a pioneering farmland preservation effort in New Jersey, predating the 2004 statewide Transfer of Development Rights Act (NJSA 40:55d-137 et seq.), which authorized the development of TDR programs by any municipality in the state.

Transfer of Development Rights (TDR) is a municipal planning and preservation tool used to protect agricultural, historic or environmental resources while accommodating the needs of development and promoting smart growth. TDR is a realty transfer mechanism permitting owners of preservation area land to separate the development rights of their property from the property itself and sell them for use elsewhere. Developers who purchase these "development credits" may then develop areas deemed appropriate for growth at densities higher than otherwise permitted. This technique allows the original parcel to be protected from development while financially compensating the owner of that parcel for the removal of those development rights.

Once the development rights of a property are sold, the land will be permanently restricted from further development by a deed restriction that runs with the land in perpetuity. TDR is an equity protection mechanism that, unlike traditional zoning, enables sending area landowners to be compensated for reduction in development potential. When well-designed, TDR can provide benefits to landowners, developers and municipalities.

The successful creation of Chesterfield's TDR program was the result of long-term planning, consensus building, community education, work with county and state officials, and civic minded compromise over the course of a decade of sustained effort. Prior to establishing its TDR program through ordinance adoption in 1997, Chesterfield had to work through numerous issues including resource and land use mapping, market analysis, establishing a method to allocate and transfer TDR credits, the development of a suitable receiving area, the development of sewer and water services essential to the development of a growth center, and the design of the ordinance to orchestrate and direct the overall process.

As stated in previous chapters, the receiving area for Chesterfield's TDR program is Old York Village, a 560-acre traditional-neighborhood community that was planned explicitly for the TDR program. Chesterfield's

First Burlington County Farm Preserved - Located in Chesterfield | Source: Chesterfield EC

sending area consists of roughly 10,000 primarily rural and agricultural acres outside of the Old York Village receiving area as well as other existing settled and developed areas of the township. See **Figure 29: Transfer of Development Rights** on page 113. By transferring development rights from these sending areas to Old York Village (the receiving area), Chesterfield's TDR program has enabled the preservation of agricultural land at much lower cost to the township than public land acquisition or the purchase of preservation easements. By allowing landowners in the sending area to sell their development rights to developers who are seeking to build in the receiving area at densities higher than would otherwise be allowed, the policy creates a tool for farmland preservation and smart growth with no cost to the township beyond staff time required to process applications to participate in the program.

Chesterfield's TDR Ordinance contains the rules and structure for the township's program. Land parcels are eligible for inclusion under the TDR program if they are located within the sending area (designated as AG Agricultural District on Chesterfield's 1997 Land Use Plan), were at least 10 acres in size on the date the ordinance was adopted and are not deed restricted from further subdivision or development. Land parcels included within the TDR program are allocated credits according to the acreage of the parcel and the septic suitability of its soil, which represents an approximation of the development potential of agricultural land. Participation in the program for landowners is voluntary. For developers who wish to build in the receiving area, credits must be obtained. Additional information on regulations surrounding Chesterfield's TDR Program is available in Chesterfield's Township Code Article XVII: Voluntary TDR Program Procedural Requirements.

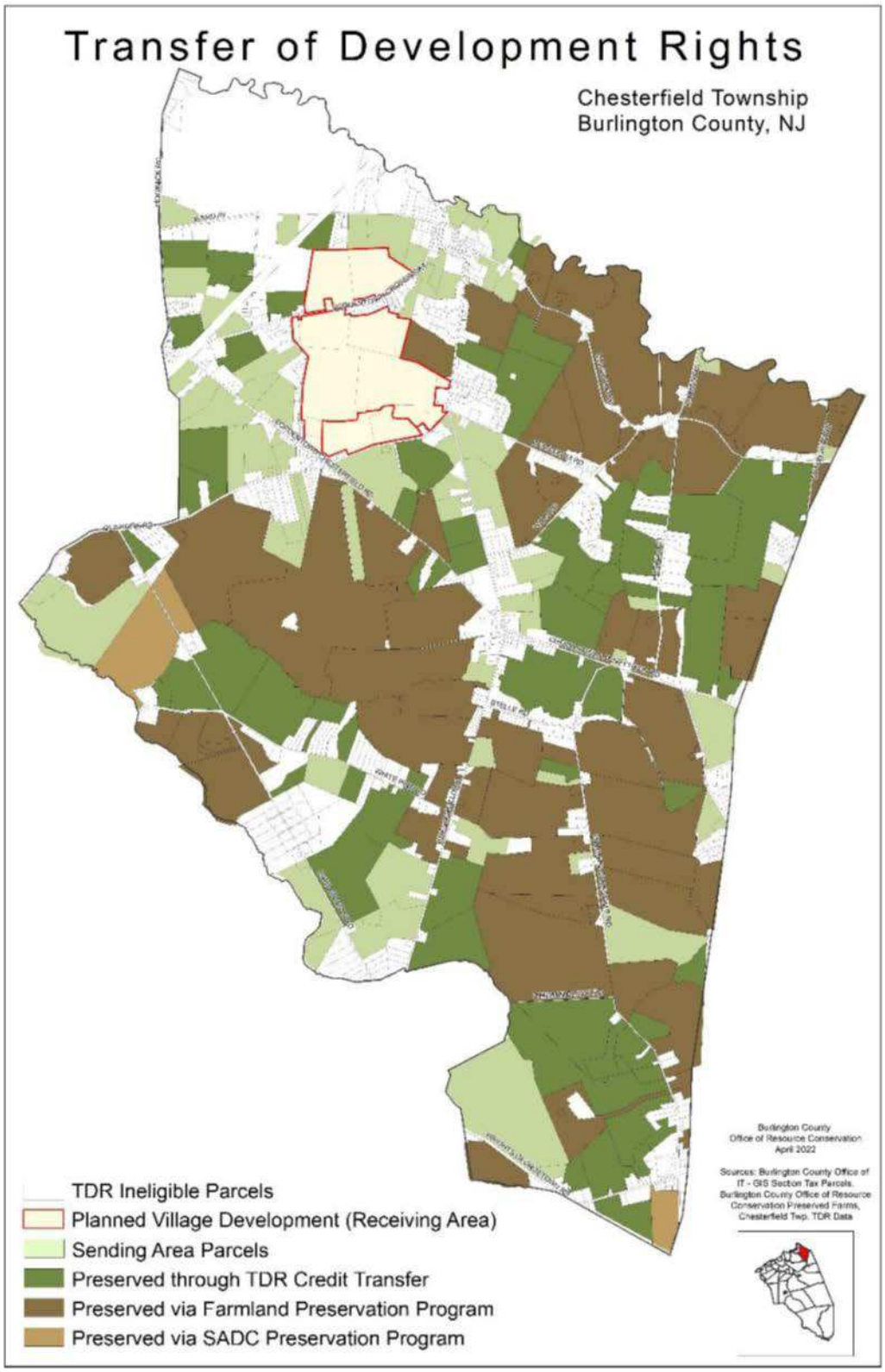
Sustained now for over 25 years, the TDR program has been highly successful in enabling the township to retain its agricultural character while accommodating significant population growth. As of 2023, Old York Village has largely been built out, accommodating 1,029 new residential units and 18 stormwater basins, as well as the new Chesterfield Elementary School, shops, businesses and high-quality community green space. The TDR program has also preserved 2,865 acres of the township's farmland through the transfer of development credits. While this represents only slightly more than a quarter of the designated sending area, a considerable amount of additional farmland has also been preserved through the Burlington County Farmland Preservation Program, as discussed below. See **Figure 29: Transfer of Development Rights** on page 113.

Burlington County Farmland Preservation Program

While Chesterfield's TDR program is both innovative and highly successful, the township has also been extraordinarily successful in preserving farmland through Burlington County's Farmland Preservation Program (FPP). Chesterfield was one of the earliest participants in the program - dating back to the mid-1980s - and has had more farmland preserved through the program than any other township in the county. The program has protected nearly 5,000 acres of farmland in Chesterfield since the 1980s through conservation easements and fee simple purchase of land. The purchase of five farms in Chesterfield totaling just over 600 acres in 1985 represented not only the beginning of farmland preservation in Chesterfield and Burlington County, but also across the entire state. The establishment of the FPP in the 1980s represented a response by Burlington County to the loss of more than half of the county's farmland since the 1950s. That the total farmland in the county has since stabilized at roughly 100,000 acres indicates the success of the FPP, as well as local efforts, such as Chesterfield's TDR program.

As of September 2022, the township has preserved 7,986 acres of farmland, including 4,913 acres through the county's Farmland Preservation Program, 208 acres through the state agricultural preservation program, and 2,865 acres through the township's TDR program. This represents over 50 percent of the township's land area.

Figure 29: Transfer of Development Rights



Source: Burlington County Comprehensive Farmland Preservation Plan, 2022

Chapter 16:

Contamination and Known Contaminated Sites

Known Contaminated Sites

The New Jersey Known Contaminated Sites List includes former industrial operations, landfills, releases from underground storage tanks (USTs), and Spill Act Sites, which includes locations of intentional or accidental contaminant release and also historic fill sites. Contamination may have affected soil, groundwater, sediment, surface water, or a combination thereof. The most dangerous sites from a human health standpoint are those on the National Priorities List, commonly known as Superfund sites. Information on Superfund sites can be retrieved using the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). According to CERCLIS, there are currently no Superfund sites in Chesterfield.

As of December 2023, NJDEP reported 501 active sites with confirmed contamination in Burlington County. Eight of these sites are located within Chesterfield Township. See **Table 26: Active Known Contaminated Sites** and **Figure 30: Known Contaminated Sites.** Among the active known contaminated sites in Chesterfield consist of three residential heating oil USTs, two former gasoline and automobile service centers, one farm property with onsite fueling operations, a minor oil spill at compressor station and several former USTs at a Department of Corrections facility. The NJDEP's Contaminated Site Remediation and Redevelopment Program is responsible for establishing criteria to address contaminated sites and ensure they are remediated within established timeframes.

In addition to managing existing sites on the New Jersey Known Contaminated Sites list, NJDEP also investigates and evaluates new sites for inclusion on the list. However, it is important to recognize that NJDEP may not have knowledge of all contamination present in a given municipality, as some contaminants from a previous use of a property may continue to be undetected (for example, contaminants may be buried underground on a site that has not been disturbed since that time), or the contamination may be unreported by the site owners.

Information on "Active Sites" published by the NJDEP Contaminated Site Remediation and Redevelopment (CSRR) Program and can be accessed by clicking on "Active Sites" from the Site Remediation Program's *Known Contaminated Sites* page (https://www.state.nj.us/dep/srp/kcsnj/). A list of closed (inactive) and pending contaminated sites is available through this link (via the "Data Miner" database). Interactive resources are also available through NJDEP Geoweb Mapping tool (https://dep.nj.gov/gis/nj-geoweb/) and by accessing them directly through the NJDEP DataMiner system (https://njems.nj.gov/DataMiner).

The Known Contaminated Site List for New Jersey is automatically updated daily so the list may change at any time as sites are identified. The list of contaminated sites may include sites where remediation is either currently under way, required but not yet initiated or has been completed. In some cases, sites are addressed via long term protective measures in the form of engineering or institutional controls, which may limit current and future use of the site. Many contaminated sites have multiple names that may refer to past or present owners or uses. The site ID and PI numbers are the most reliable means of getting updates on the status of a particular contaminated site.

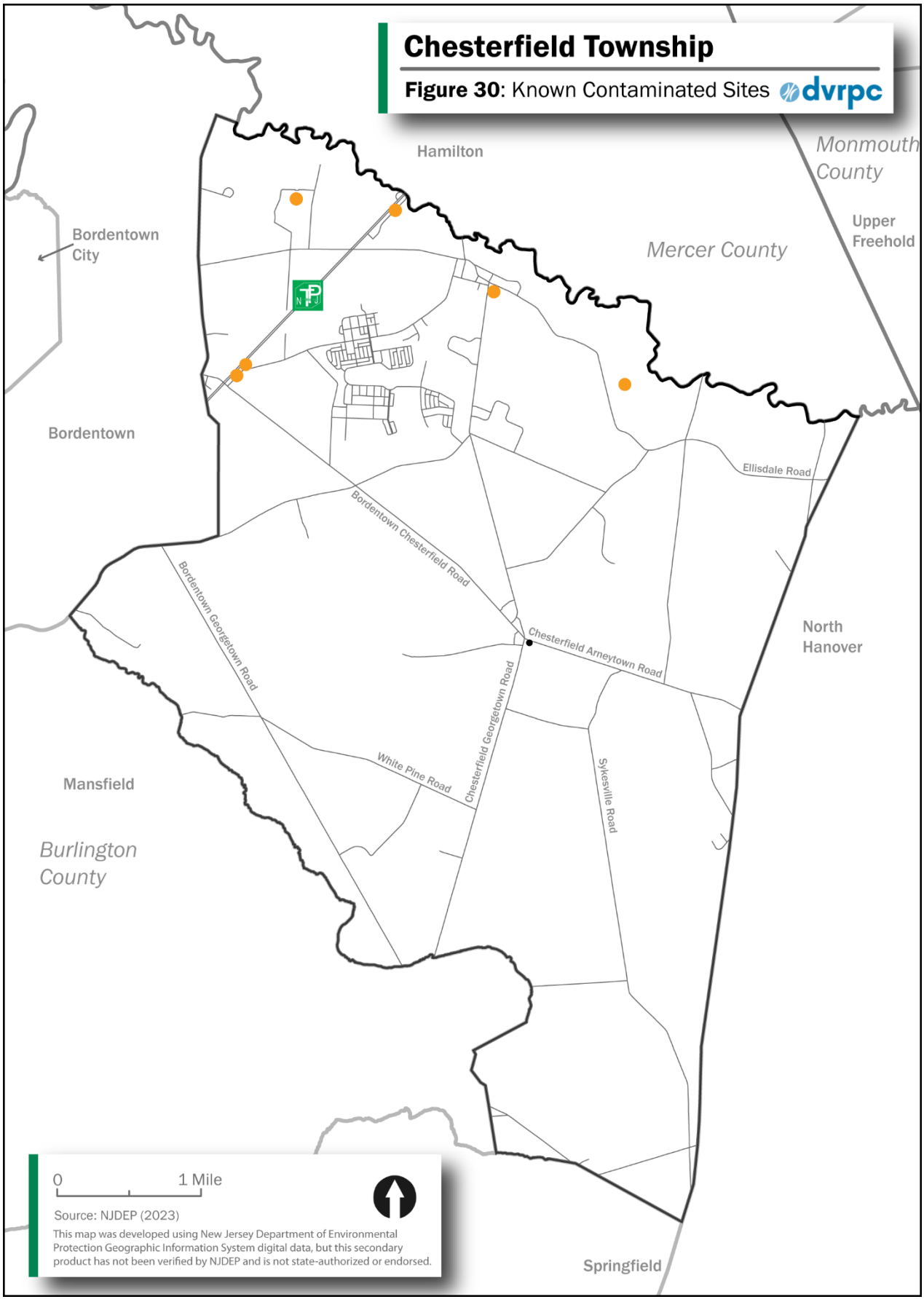

Chesterfield Township
Figure 30: Known Contaminated Sites
dvrpc
Hamilton
Monmouth County
Upper Freehold
Bordentown City
Mercer County
Bordentown
Ellisdale Road
Bordentown Chesterfield Road
Bordentown Georgetown Road
Chesterfield Arneytown Road
North Hanover
Chesterfield Georgetown Road
White Pine Road
Sykesville Road
Mansfield
Burlington County
Springfield
0
1 Mile
Source: NJDEP (2023)
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.

Table 26: Active Known Contaminated Sites

Name	Address	Site ID	Program Interest Number
5 Chesterfield Crosswicks Rd	5 Chesterfield Crosswicks Rd	627840	801218
225 Bordentown Crosswicks Rd	225 Bordentown Crosswicks Rd	497273	626772
227 Bordentown Crosswicks Rd	227 Bordentown Crosswicks Rd	497263	626762
Albert Wagner Youth Correctional Facility	500 Ward Avenue	11029	002910
Colonial Pipeline	493 Ward Avenue	30754	219029
Frosty Cool (Former Gas Station)	632 Route 528	53660	022053
Katona Farms	355 Ellisdale Road	41901	001296
Sunoco Logistics Partners LP	New Jersey Turnpike Exit 7 & 7A	375388	514697

Source: NJDEP DataMiner, 2023

Underground Storage Tanks

Property owners in Chesterfield may use storage tanks to store fuel oil, or in the case of service stations, gasoline or diesel fuel. Older storage tanks are increasingly likely to have outdated leak control and corrosion prevention measures and must be monitored for emissions. Corrosion and leakage of underground storage tanks can impact soil and ground water.

Commercial sites with underground storage tanks over 2,000 gallons in size are monitored under an NJDEP program called the Bureau of Underground Storage Tanks (BUST). Sites are registered, receive permits, and are monitored for leaks at regular intervals. As of the publication of this ERI, there was only one actively registered UST system in Chesterfield, at the New Jersey Turnpike Authority Maintenance Located at Mile marker 57.3. Two UST are present, totaling 20,000 gallons in capacity and containing unleaded gasoline and diesel fuel. These USTs contain modern leak detection and prevention technology and no release has been identified in association with these USTs.

Some homeowners in Chesterfield may also have underground storage tanks, which are primarily used to hold home heating oil. However, tanks used for home heating oil, or any heating oil tank under 2,000 gallons, are exempt from NJDEP registration and permitting requirements. These tanks are therefore not listed or tracked by the NJDEP BUST program unless a release is identified, in which case the site would be issued a Site ID and information made available via NJDEP's DataMiner system. Three such properties have been identified in Chesterfield.

Historic and Current Landfills

As of 2014, when NJDEP most recently updated its landfill records, Chesterfield contained no current landfill sites and one historic landfill site: the eight-acre J. Vinch landfill at 40 Ward Avenue, closed in 1988. According to NJDEP's landfill records, it has been marked as "Properly Closed," which means it has been verified as properly closed in accordance with the Solid Waste Regulations by the Department's Division of Solid and Hazardous Waste. This was a private, sole-source landfill of bulk waste from the Vinch Demolition company. As of the publication of this ERI, the landfill site is included within the NJDEP DataMiner database for Closed Sites with Remediated Contamination.

Landfills pose a number of potential environmental problems, including groundwater contamination and harmful air emissions. Current EPA landfill regulations mandate that the owner or operator of the landfill conduct at least 30 years of post-closure care and monitoring to ensure that the landfill's leachate (i.e., water that has passed through a landfill) is properly removed and treated so that it does not leak into its surroundings and contaminate the surrounding soil and groundwater. While current landfill regulations have greatly decreased the probability of landfill failure within the 30-year post-closure window, it is likely that these systems will remain in danger of leaking and contaminating the outside environment well into the future, beyond the mandated post-closure period.

Table 27: Historic Landfills

Name	Address	Solid Waste Program Interest Number	Owner/Operator Type	Sole Source?
J. Vinch	40 Ward Avenue	131944	Private	Yes

Source: NJDEP, 2014

Historic Fill

Historic fill material is defined by the NJDEP as non-indigenous material, deposited to raise the topographic elevation of the site, which was contaminated prior to emplacement and is in no way connected with the operations at the location of emplacement. Historic fill can include construction debris, dredge spoil, incinerator residue, demolition debris, fly ash or other non-hazardous solid waste. Historic fill is identified throughout the state and is most frequently identified along industrialized waterfronts areas in the northeastern and southwestern parts of New Jersey. NJDEP and the NJ Geological Survey (NJGS) maintains mapping of known or suspected areas of historic fill, which can be viewed via the DataMiner database. DataMiner is the most complete source of information regarding historic fill; however, it is possible that unmapped areas exist and have not been identified to date. The presence of historic fill will generally result in a known contaminated site listing and possible limitations on future development.

Mapping information is not currently maintained for the southern two thirds of Chesterfield Township. In the northern region, several areas of mapped historic fill have been identified. These areas are generally along roadways such as the NJ Turnpike, Ward Avenue, Church Street, Bordentown Crosswicks Rd and Chesterfield Crosswicks Road. To date, historic fill has not been identified in any residential area of Chesterfield.

Groundwater Contamination

There are two sites within Chesterfield that have evidence of groundwater contamination from various sources (see **Table 28** below). These sites are restricted by a Classification Exception Area (CEA) designation, which is a geographically defined area within which the local groundwater resources are known to be contaminated (i.e., the water quality does not meet drinking water and groundwater quality standards for specific contaminants). A CEA can be established for a contaminated site's aquifer if state drinking water quality standards are not met due to: (1) natural groundwater quality, (2) discharges from an NJPDES permitted site, or (3) pollution caused by human activity.

A CEA designation suspends aquifer use in the affected areas until state drinking water standards are met. It is not a groundwater remedy, but rather an institutional control established in conjunction with an approved remedy. NJDEP may revise or establish a CEA at any time to more accurately reflect the groundwater conditions using revised data.

Before a CEA expires, the party responsible for remediation collects at least two rounds of groundwater samples in a way that accounts for seasonal fluctuations in the groundwater table and represents the entire horizontal and vertical extent of the groundwater CEA. If the samples indicate that contaminant concentrations have decreased below the target groundwater quality standard, the responsible party can request removal of the CEA from NJDEP. When NJDEP approves the removal, the CEA designation is terminated. If the samples indicate that the contaminant concentration is not going to be reduced below the standard by the expiration of the CEA, the CEA may be extended or active remediation may be underetaken.

Table 28: CEAs

Name	Address	Preferred ID	Area of Site (Acres)	Depth of Site (Feet)	Established Date	Duration (Years)
Katona Farms	355 Ellisdale Road	001296	1.43	35	10/24/2019	Indeterminate
Sunoco Logistics Partners LP	New Jersey Turnpike Exit 7 & 7A	514697	1.85	15	1/22/2020	13.29

Source: NJDEP, 2023

Radon

Radon is a radioactive gas that comes from the natural decay of uranium found in nearly all soils. It moves up through the ground to the air above, and into homes through cracks and other holes in foundations. A buildup of radon-contaminated air within a home can pose a long-term health hazard to residents, potentially causing lung cancer. The only method of detection is to conduct a test for alpha particles in the air within a home. Fortunately, radon testing is inexpensive. All radon test results conducted in the state are reported to NJDEP by certified companies, which perform the tests or manufacture the test kits. This data is used to classify municipalities into a three-tier system, which identifies the potential for homes with indoor radiation problems.

As of 2015, the most recent date listed on the NJDEP website, Chesterfield was listed as a Tier 1 municipality; that is, a municipality with high potential of having high radon levels in homes. The criteria for a Tier 1 municipality designation is that at least 25 percent of homes tested in the municipality (among a

minimum of 25 homes tested) have radon concentrations greater than or equal to 4.0 picocuries per liter in the air. A 4.0 picocurie measurement is the level at which homeowners should take immediate action to remove the radon in their homes. Although only 20 percent of homes tested in Chesterfield had radon concentrations this high as of 2015, NJDEP does not lower radon tiers if a percentage of homes with high radon concentrations ever surpassed 25 percent in the past. The Tier 1 designation triggers requirements for radon resistant new construction.

Chapter 17:

Conclusion

The history of Chesterfield Township reflects the stories of the peoples who inhabited the landscape and the rich tapestry of environmental resources and conditions with which they have interacted. For thousands of years, Lenni Lenape people lived in the forests, waterways, and fields of what is today south-central New Jersey. English Quaker colonists settled in the area in the second half of the 17th Century and took advantage of its productive soils to establish Chesterfield as an agricultural community, dotted with a few small villages. Chesterfield retains much of this quality and character to this day.

The 20th century saw the construction of the New Jersey Turnpike, the Albert C. Wagner State Youth Correctional Facility, and the Garden State Youth Correctional Facility in the northern corner of the township. However, despite development pressures that resulted in sprawling suburban development throughout much of the non-Pinelands portions of southern New Jersey beginning in the 1950s, Chesterfield has largely maintained its agricultural industry and character. Blessed with rich soils and favorable climate, Chesterfield has made protecting is agricultural productivity a priority. In the past three decades, Chesterfield's preservation efforts have been fueled by its successful transfer of development rights program. That program has permanently protected thousands of acres of farmland while allowing limited concentrated development – almost all of which has taken place in Old York Village. Old York Village itself is a unique success story, showing how a preservation-minded township can increase its housing supply and meet the demands for new development, all while building a highly livable, sustainable, walkable and green community that stands apart from traditional suburban development.

This document lays a foundation for protecting not only Chesterfield's agricultural and rural character going forward, but also for protecting the wide variety of plant and animal life, wetlands, waterways, forests, and open spaces found throughout the township. Issues such as pollution, erosion, flooding, habitat loss, and development pressure are still present in the township, but projects such as this ERI along with active, long-standing community organizations, civic capacity, and strong, forward-looking local governance will allow Chesterfield to continue to grow and thrive while balancing the protection of the community's resources with the pressures of growth and change.

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Appendices

A: Wildlife Species in Chesterfield

B: Tree Species in Chesterfield

C: NJ Standards for Soil Erosion and Sediment Control excerpt)

Appendix A: Wildlife Species Observed in or near Chesterfield

Bird Species

These bird species were observed at one location in Chesterfield Township (Bright View Farm) and six locations neighboring the township, as listed below. Documentation of the bird sightings can be found on ebird.org, part of the Cornell Lab of Ornithology.

The 7 locations are:

- Bright View Farm - Wrightstown Georgetown Rd, Georgetown
- Brigadier General William C. Doyle Memorial Cemetery - Province Line Rd, Arneytown
- Crosswicks Creek Park, Historic Walnford - Walnford Rd, Polhemustown
- Reid Sod Farm - Harrison Rd, Jacobstown
- Crystal Lake Park - Rt 130, Hedding
- Kinkora Trail - E. Main St, Columbus
- Burlington County Fairgrounds - Rt 206 & Jacksonville Jobstown Rd, Springfield

List of Observed Bird Species

Mourning Dove
Killdeer
Least Sandpiper
Solitary Sandpiper
Red-tailed Hawk
American Kestrel
Barn Swallow
European Starling
Northern Mockingbird
Eastern Meadowlark
Red-winged Blackbird
Common Yellowthroat
Canada Goose
Laughing Gull
Green Heron
Turkey Vulture
Fish Crow
Tufted Titmouse
Purple Martin
Tree Swallow
House Wren
Grey Catbird
American Robin
American Goldfinch
Grasshopper Sparrow
Chipping Sparrow
Song Sparrow
Swamp Sparrow
Indigo Bunting
Chimney Swift
Black Vulture
American Crow
Cedar Waxwing
House Finch
Wood Duck
Yellow-billed Cuckoo
Cooper's Hawk
Red-bellied Woodpecker
Willow Flycatcher
House Sparrow
Brown-headed Cowbird
Northern Cardinal
Rock Pigeon
Downy Woodpecker
Eastern Kingbird
Common Grackle
Mallard
Field Sparrow
Blue Grosbeak
Warbling Vireo
Dickcissel
Carolina Wren
Pine Warbler
Northern Rough-winged Swallow
Bank Swallow
Blue Jay
Great Blue Heron
Northern Flicker
White-breasted Nuthatch
Eastern Bluebird
Baltimore Oriole
Yellow Warbler
Savannah Sparrow
Orchard Oriole
American Woodcock
Eastern Phoebe
Great Crested Flycatcher
Red-eyed Vireo
Northern Harrier
Eastern Wood-Pewee
Carolina Chickadee
Bobolink
Osprey
Yellow-rumped Warbler
Bald Eagle
White-throated Sparrow
Ruby-crowned Kinglet
Hermit Thrush
Dark-eyed Junco
Herring Gull
American Tree Sparrow
Merlin
Ring-billed Gull
Greater White-fronted Goose
Common Raven
Fox Sparrow
Snow Goose
Red-shouldered Hawk
Peregrine Falcon
Orange-crowned Warbler
Short-eared Owl
American Black Duck
Ross's Goose
Eastern Screech-Owl
Sharp-shinned Hawk
Hairy Woodpecker
Golden-crowned Kinglet
Winter Wren
American Pipit
Purple Finch
Pine Siskin
Vesper Sparrow
Common Nighthawk
Scarlet Tanager

Upland Sandpiper
Semipalmated Sandpiper
Wild Turkey
Black-bellied Plover
Spotted Sandpiper
Blackpoll Warbler
Greater Yellowlegs
Wilson's Snipe
Rough-legged Hawk
Horned Lark
Rusty Blackbird
Great Horned Owl
Great Black-backed Gull
White-crowned Sparrow
Palm Warbler
American Redstart
Lesser Yellowlegs
Ruby-throated Hummingbird
Short-billed Egrebalt
Great Egret
Cattle Egret
Brown Thrasher
Wood Thrush
Blue-gray Gnatcatcher
Snow Bunting
Yellow-bellied Sapsucker
Cackling Goose
Green-winged Teal
Red-breasted Nuthatch
Brown Creeper
Northern Parula
Cliff Swallow
Pectoral Sandpiper
Eastern Towhee
Acadian Flycatcher
Pied-billed Grebe
Ovenbird
Belted Kingfisher
American Golden-Plover
Sanderling
Semipalmated Plover
Sora
Virginia Rail
Ring-necked Duck
Mute Swan
White-eyed Vireo
Tricolored Heron
Black-and-white Warbler
Prairie Warbler
Hooded Merganser
Pileated Woodpecker
Swainson's Thrush
Connecticut Warbler
Buff-breasted Sandpiper
Double-crested Cormorant
Ruddy Duck
American Wigeon
Redhead
Northern Pintail
Lesser Black-backed Gull
Broad-winged Hawk
American Coot
Rose-breasted Grosbeak
Tundra Swan
Gadwall
Glaucous Gull
Lincoln's Sparrow
Magnolia Warbler
Black-throated Green Warbler
Chestnut-sided Warbler
Philadelphia Vireo
Tennessee Warbler
Blackburnian Warbler
Black-throated Blue Warbler
Northern Waterthrush
Nashville Warbler
Cape May Warbler
Canada Warbler
Glossy Ibis
Black-billed Cuckoo
Common Loon
Least Flycatcher
Crested Caracara
Blue-headed Vireo
Veery
Wilson's Warbler
Yellow-headed Blackbird
Bay-breasted Warbler
Kentucky Warbler
Mourning Warbler
Hooded Warbler
Black-crowned Night-Heron
Common Merganser
Marsh Wren
Sedge Wren
White-rumped Sandpiper
Nelson's Sparrow
Curlew Sandpiper
Baird's Sandpiper
Dunlin
Summer Tanagerbald
Sandhill Crane
Yellow-breasted Chat
White-crowned Sparrow
Dickcissel
Ring-necked Pheasant
Blue-winged Warbler
Golden Eagle
Barred Owl
Scissor-tailed Flycatcher
House Finch
Lesser Scaup
Olive-sided Flycatcher
Canada Warbler
Yellow-bellied Flycatcher
Worm-eating Warbler
Snowy Egret
Bufflehead
Little Blue Heron
Black-capped Chickadee

List of Observed Fish Species:

American eel
Atlantic butterfish
Black sea bass
Bluefish
Bluegill
Eastern silvery minnow
Inshore squid
Redbreast sunfish
Scup
Shad
Summer flounder

List of Observed Mammal Species:

Beaver
Eastern cottontail rabbit
Coyote
Eastern gray squirrel
Flying squirrel
Little brown bat
Mink
Muskrat
Opossum
Raccoon
Skunk

List of Observed Reptile Species:

Bog turtle
Corn snake
Milk snake

List of Observed Amphibian Species:

American bullfrog
Spring peeper
Tiger salamander

Appendix B: Tree Species Commonly Found in Chesterfield

Chestnut Oak - Quercus prinus
Flowering Dogwood - Cornus florida
Black Birch (Sweet) - Betula lenta
Sweet Bay Magnolia - Magnolia virginiana
White Cedar - Chamaecyparis thyoides
Staghorn Sumac - Rhus typhina
Callery Pear - Pyrus calleriana
London Planetree - Platanus x acerfolia
Weeping Willow - Salix babylonica
American Holly - Ilex opaca
Pitch Pine - Pinus rigida
Tree of heaven - Ailanthus altissima

Planted in hedge rows and reclamation areas:

Norway Spruce - Picea abies
Colorado Blue Spruce - Picea pungens
Serbian Spruce - Picea omorika
Douglas Fir - Pseudotsuga
Japanese Black Pine - Pinus thunbergii

Appendix C: Standards for Soil Erosion and Sediment Control in New Jersey (excerpt)

Reproduced below is an excerpt of New Jersey's Standards for Soil Erosion and Sediment Control. For further details please consult the full standards at https://www.nj.gov/agriculture/divisions/anr/pdf/2014NJSoilErosionControlStandardsComplete.pdf.

Developing a Successful Plan to Control Soil Erosion on Construction Sites

"He who fails to plan, plans to fail…." is an oft-quoted proverb. Its original author is unknown, but it is frequently attributed to such famous individuals as Benjamin Franklin, Abraham Lincoln and Winston Churchill. Regardless of who coined the phrase, failure to plan (properly) is never more evident than in a poorly thought out erosion and sediment control plan. Once a slope has eroded, or an infiltration basin has failed, it is too late to 'plan'. It is only time to react and correct. And usually, it costs more to do something twice, than to do it right the first time.

Though not an exhaustive list, the following represent many of the primary design considerations and constraints in preparing an effective erosion control plan. Effective erosion control should be integrated into planning for stormwater management, and not done as an after-thought. A properly developed plan should address the following aspects of site construction when designing for erosion control:

General Considerations

1. Design report included and submitted to the district
2. Table of Contents for the design report denoting location of erosion control designs
3. Plan drawn at proper scale (usually not less than 1:50)
4. Erosion Control Plan sheets labeled, signed and sealed by a NJ Licensed Engineer or Architect
5. Pre and post construction contours clearly labeled and depicted
6. Limits of disturbance clearly delineated and corresponding to area of disturbance on the application form
7. Temporary controls such as sediment barriers, inlet filters graphically depicted on plan sheets
8. Details for erosion control applications clearly shown on a 'detail sheet'; dimensions correspond to design report
9. District notes, vegetative stabilization specifications and other notes shown on the detail page
10. Soil delineations shown on the erosion control plan sheets
11. Other natural features, such as streams, wetlands and buffers delineated on plan sheets
12. Permanent structures graphically depicted on plan sheets (piping, basins, rip rap outlets, swales, basins etc.)
13. Offsite improvements (sewer, water, storm drainage, electrical utilities) shown and included in area calculations
14. Proposed staging and stockpile areas depicted (on and off site).

Construction Disturbance Considerations

1. Phasing of disturbed areas (minimizing open soil areas)
2. Sequence of construction specific to the site (avoid generic sequencing)
3. Stormwater management on a construction site
   (a) Temporary sediment basins with design support and appropriate details
   (b) Diversions & swales
   (c) Grading
   (d) Filtering via pumped discharge
   (e) Dewatering excavations and points of discharge
4. Temporary stabilization with vegetation, mulch, man-made materials etc.
5. Location of temporary controls such as inlet filters, sediment barriers, construction entrances

6. Soil movement – cuts, fills, removal, stockpiles and importation shown on plans
7. Minimization of soil compaction – restrict vehicle travel, avoid working wet soils, restore if needed

Hydrologic Design Considerations

1. Correct application of hydrologic analysis both onsite and within the local drainage area
   (a) Correct unit hydrograph (i.e., Delmarva for coastal plain areas)
   (b) Pre and post drainage area maps with Tc flow paths and POI's identified
   (c) Realistic sheet flow length in time of concentration (in all cases, not to exceed 100')
   (d) Correct pre and post development runoff coefficients
   (e) Influence of geology (esp. limestone prone areas)
   (f) Submission of electronic modeling files to the district
   (g) Submission of Hydrologic Summary forms for each basin
2. Assessment of pre and post development flows for the 2, 10 and 25 (rip rap) year storm events
3. Determination of soil types and their associated limitations (i.e., depth to ground water, slope stability) using the Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm)
4. Final points of discharge from the site and stability at those locations
5. Discharging to agricultural fields (generally not permitted due to stability concerns)
6. Infiltration and failure analysis for stability
7. Impact of discharge beyond the limits of the project (off site stability)
8. Stability of slopes – both from overland flow as well as impacts due to infiltration saturation
9. Proper use of permanent vegetative cover – species selection, irrigation, soil quality, maintenance
10. Use of turf reinforcement matting on steep slopes or channel lining
11. Rock rip rap sizing, gradation and availability; alternate use of gabions or reinforced concrete
12. Grass water way designs using vegetative retardance (D & E) factors, soil conditions, velocity, proper vegetation and reinforcement mating

Requirements of Other Agencies

1. NJ Department of Environmental Protection
   (a) Stormwater Rules
   (b) Wetlands
   (c) Highlands
   (d) Stream Encroachment
2. Residential Site Improvement Standards
3. NJ Department of Transportation
4. NJ Pinelands Commission
5. County and municipal construction codes

When preparing an erosion control plan, one resource which should not be overlooked is New Jersey's 15 Soil Conservation Districts. With a broad spectrum of expertise in the areas of erosion and sediment control, agronomy, horticulture and stormwater management, District staff are available to assist designers with the development of reliable and effective strategies for controlling erosion from construction sites. A list of New Jersey Soil Conservation District contact information is found in Appendix E of the Standards.

Environmental Resource Inventory for the Township of Chesterfield

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Abstract:
This publication documents the natural and community resources of Chesterfield Township, Burlington County, New Jersey. The natural resource information includes descriptions, tables, and maps of: land use; soils; drinking water, aquifers, and wells; surface waters, including watersheds, streams, lakes, wetlands, and floodplains; impacts on water resources and surface water quality; impervious coverage; vegetation, including wetlands, forests, and grasslands; animal communities; threatened and endangered species; Landscape Project Priority Habitats; and known contaminated sites. Community resources in the form of protected open space and recreation facilities are also briefly described. A short history of the community is also included.

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