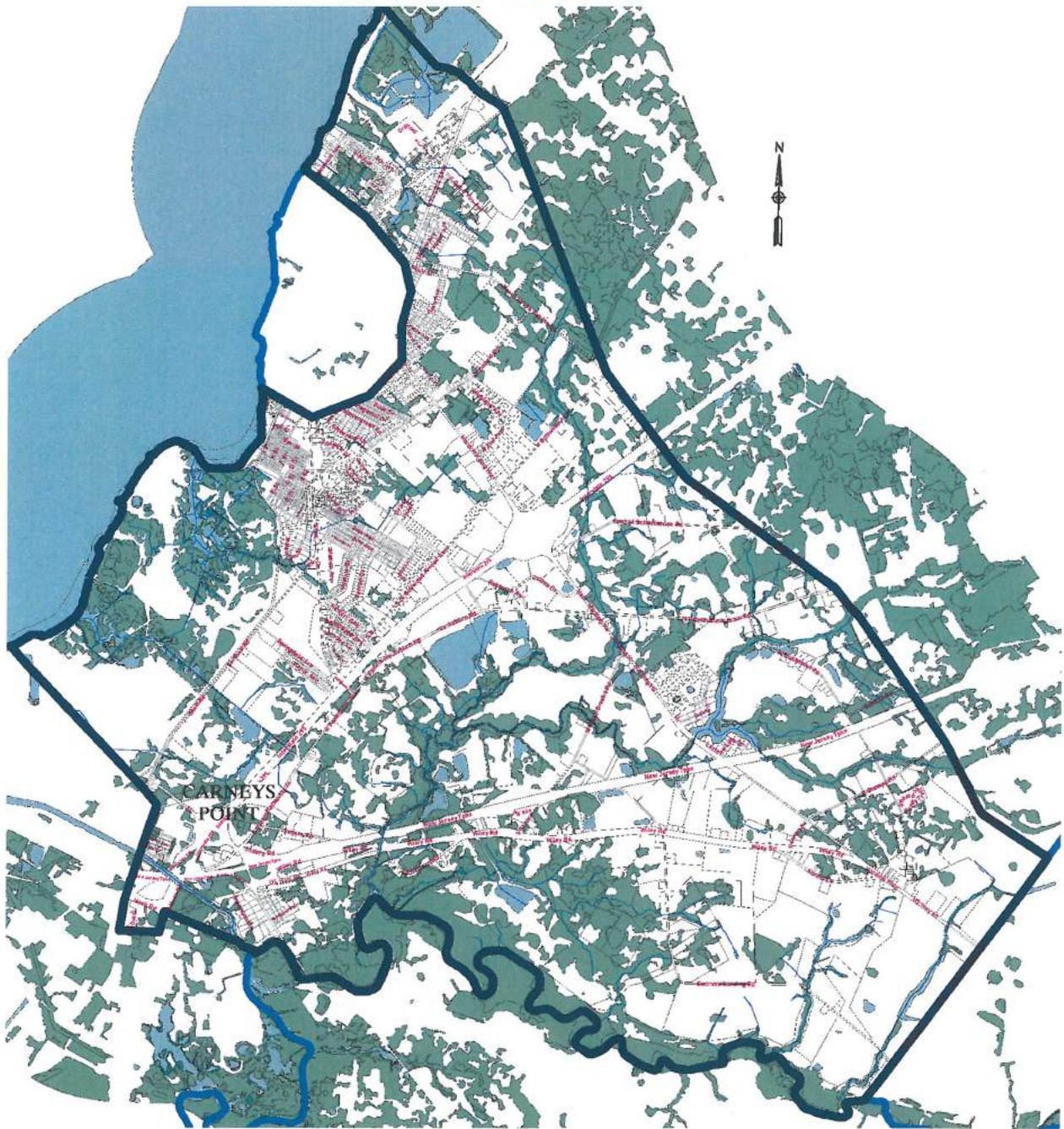


TOWNSHIP OF CARNEYS POINT STORMWATER MANAGEMENT PLAN



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TOWNSHIP OF CARNEYS POINT,
SALEM COUNTY NEW JERSEY
ISSUED: MARCH 31, 2005
REVISED: MARCH 12, 2021

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INTRODUCTION

A Stormwater Management Plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations and the Township's Stormwater NJPDES Permit (NJ0141852). This Stormwater Management Plan contains all the elements required in N.J.A.C. 7:8 Stormwater Management Rules and is consistent with the N.J. Residential Site Improvement Standards (NJSIS) at N.J.A.C. 5:21 and the Standards for Soil Erosion and Sediment Control in New Jersey. The Carneys Point Township Stormwater Management Plan documents the strategy for the Township to address stormwater related issues and impacts in the Township and its water bodies. The plan addresses stormwater design and performance standards that the Township will implement to deal with stormwater quantity, stormwater quality, and groundwater recharge. The design and performance standards shall be implemented for any new major development. New major development is defined as the disturbance of one acre or more, the creation of one-quarter acre or more of regulated impervious surface, the creation of one-quarter acre or more of regulated motor vehicle surface, or the combination of regulated impervious surface and regulated motor vehicle surface totaling one-quarter acre or more. The Standards are intended to minimize the adverse impact of stormwater runoff on water quality, water quantity and the loss of groundwater recharge that provides base flow to the aquifers and receiving water bodies. The plan describes long term operation and maintenance measures for existing and future stormwater facilities and the use of non-structural strategies to control and reduce the impacts of stormwater runoff.

The Plan provides background information on the Township with statistical data and maps, and addresses stormwater related issues in the Township. The plan also includes a review of any proposed amendments to existing ordinances and the Township Master Plan to allow for project designs that include the use of non-structural strategies and low impact development techniques. The final component is a mitigation plan for when a variance or exemption of the design and performance standards is sought. A mitigation plan allows for variances or exemptions by providing alternate strategies within the watershed to offset the impacts of the variance or exemption.

The Township's Stormwater Management Plan is subject to review by the Salem County Planning Board and/or Engineer to determine whether the plan meets the standards required by the Stormwater Management Rules. A copy of the adopted plan must also be sent to the NJDEP, Dept of Watershed Mgt. The County must approve, conditionally approve, or disapprove the plan in writing within 60 days. Generally, the plan becomes effective upon approval by the County; however, in the case of conditional approvals, the plan becomes effective after the municipality meets the conditions of approval.

GOALS

The goals of the Carneys Point Township Stormwater Management Plan are to:

- Reduce flood damage, including damage to life and property;

- Minimize, to the extent practical, any increase in stormwater runoff from any new development;
- Reduce soil erosion from any development or construction project;
- Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- Maintain groundwater recharge;
- Prevent, to the greatest extent feasible, an increase in non-point pollution;
- Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- Require use of low impact development techniques to protect the Township's material features and environmentally sensitive areas;
- Protect water quality to preserve the Township's aquifers and public water supply;
- Minimize pollutants in stormwater runoff from new and existing development 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
- Protect public safety through the proper design and operation of stormwater basins.

The goals and objectives of the Carneys Point Township Master Plan that are related to and that comply with the intentions of the Stormwater Management Plan are:

ENVIRONMENTAL PROTECTION - The protection of environmentally sensitive lands from development and inappropriate agricultural practices will ensure that Carneys Point will remain in ecological balance for future generations.

OBJECTIVES

- Because of Carneys Point's extensive lake system, stream corridor preservation is a high priority for protection and preservation.
- Use innovative zoning techniques to minimize intrusions into environmentally sensitive lands from development.
- Encourage the use of conservation easements on environmentally sensitive land to prevent future encroachments.

LAND USE - Land use is to be related to the existing natural capacities of the environment and the level of infrastructure existing or proposed in the Master Plan. Carneys Point is to remain a place surrounded by farmland and woodland. However, as of the date of this document, Carneys Point is experiencing the beginning of land use growth due to anticipated warehousing development.

OBJECTIVES

- Maintain land use objectives that support agriculture and the rural landscape in nearly all locations, and promote the visual enjoyment of the land through retention of scenic outlooks and corridors.
- Direct new development and redevelopment to places in relation to their transportation and environmental capacities.
- Utilize natural features to distinguish the permitted intensity of land development. Establish controls on the permitted disturbance of natural features, including tree clearance, during land development.
- Commercial and industrial land uses should be limited in extent and concentrated in relation to the state highway network and where adequate sanitary sewerage facilities are located.

OPEN SPACE & RECREATION

Opportunities for open space acquisition, conservation and recreational purposes should be enhanced through public and private efforts. Adequate active recreation facilities should be maintained through governmental action and citizen participation.

OBJECTIVES

- Plan a Greenway Network to connect existing and proposed open space parcels principally along stream corridors. The Greenway Network is intended for conservation purposes, instead of public access.
- During the development review process, examine applications for ways to enhance and extend the Greenway Network.
- Ensure that new residential development is designed to provide for the recreational needs of future residents and connections to the Greenway Network.

STORMWATER DISCUSSION

Land development can dramatically alter the hydrologic cycle (Figure 1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site.

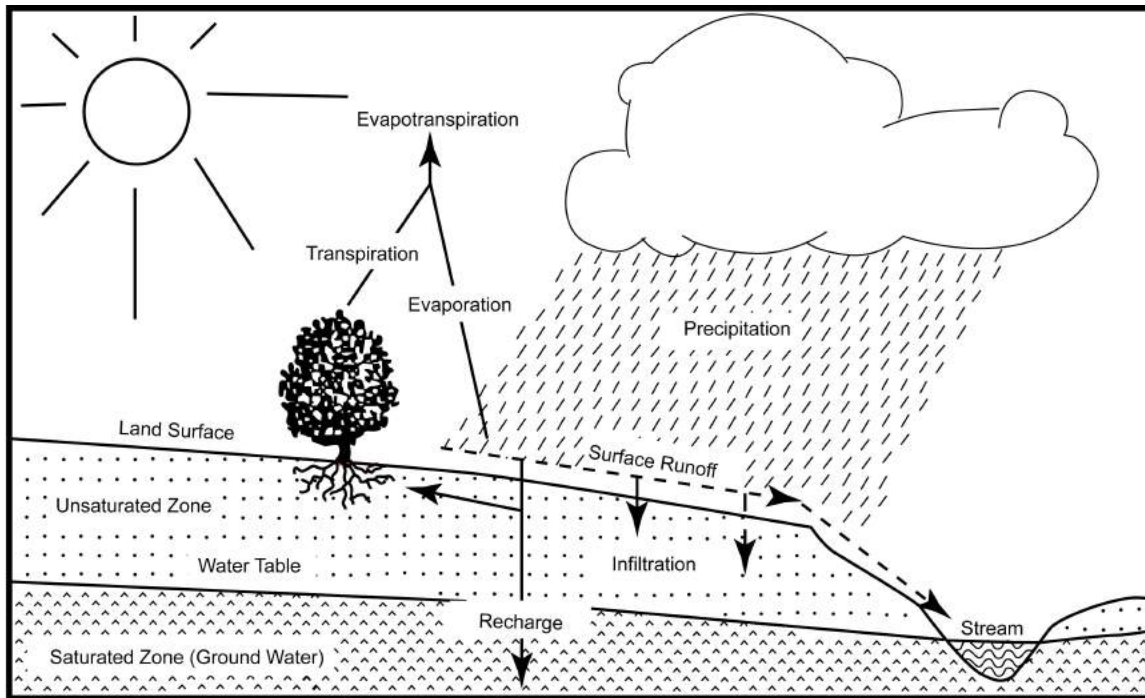
Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or

travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community. (NJDEP's Stormwater Best Management Practices Manual, 2004 as amended through March 2021)

Figure 1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

BACKGROUND

Carneys Point Township is a rural, agriculturally based community located in the northwest corner of Salem County. Agriculture and Chemours is a mainstay of the economic activity in the municipality. As of the date of this document, the Township is experiencing the beginning of land use growth. Two distribution warehouses have recently broken ground (1.5 million square feet +/-). Numerous other developers have expressed interest in warehouse construction due to Carneys Point's location along Rt. 295 and the NJ Turnpike as well as its substantial land areas within the sewer service area. The 2021 update of the MSWMP represents a snapshot of the agricultural character of Carneys Point. Future updates to the MSWMP should focus on changes to the land cover, especially along Game Creek (HUC 02040206030070).

The Township of Carneys Point encompasses a 17 square mile (10,880 +/- acre) area in Salem County, New Jersey. The population has increased from 6,914 in 2000 to 8,049 in 2010 (2010 Census Information); the population was estimated to have slightly decreased to 7,674 in 2019 (US Census Bureau QuickFacts). The significance of protecting the Township's waterways and providing design and performance standards is essential as the population and demand for new development increases. Figure 2 depicts the waterways in the Township and Figure 3 depicts the Township boundary on the USGS Quadrangle Map.

GEOLOGY AND SOILS

Carneys Point Township is located in the Atlantic Coastal Plain Physiographic Province. The Coastal Plain Province encompasses an area of 4,667 square miles or approximately sixty percent of the State. All of Salem County is located within this Province. The Atlantic Coastal Plain is composed of a sequence of unconsolidated highly permeable to relatively impermeable quartzose gravel, sand, silt, glauconitic sand and clay strata. The depth to bedrock in the Township is approximately 2000+/- feet below sea level.

The Coastal Plain Province in New Jersey is further broken down into the Inner and Outer Coastal Plain. Carneys Point Township lies within the Outer Coastal Plain. Soils within this Province are sandier and have a lower proportion of clay as compared to those in the Inner Coastal Plain.

The topography in Carneys Point Township has very little undulation and is flat and gently sloping, which is characteristic to most of southern New Jersey within the Outer Coastal Plain. There are few problems with erosion due to the high permeability of the mainly level landscape. Carneys Point Township has very few areas with slopes greater than five percent.

The soils in Carneys Point Township are composed of water deposited clays, silts and gravel of the Cohansey formation characteristic of the region. These materials are highly permeable and quite acidic. The Cohansey Sands are an important water bearing formation. This formation accounts for more recharge area than all other aquifers in the Outer Coastal Plain combined.

Carneys Point Township consists of three major soil associations or aggregated groups of soils. The first association is the Aura-Sassafras-Downer Association which makes up about 80% of the Township's landscape. This association is comprised of gravelly and sandy, well drained, mainly gently sloping soils. The next association is the Chillum-Othello-Mattapex Association. This association is found in the southwestern portion of the Township and consists of silty, mainly poorly drained soils that are nearly level to gently sloping. The third type, occurring just south of Elmer, is the Sassafras-Woodstown-Fallsington Association. This association is comprised of sandy well drained to poorly drained nearly level to gently sloping soils. The latter two associations account for the remaining 20% of the Township's land area. (Carneys Point Township Master Plan, dated December 18, 2000, last re-examination report dated April 11, 2014).

GROUNDWATER AQUIFERS & RECHARGE AREAS

Aquifer recharge is an essential component of the hydrologic cycle and in protecting the Township's drinking water supply and public community water supply wells. Figure 5 indicates the public community water supply wells within or adjacent to the Township and the wellhead protection areas. A Well Head Protection Area (WHPA) in New Jersey is a map area calculated around a Public Community Water Supply (PCWS) well in New Jersey that delineates the horizontal extent of ground water captured by a well pumping at a specific rate over a two-, five-, and twelve-year period of time. The area of capture over two-, five-, and twelve-years is defined using line boundaries and polygon areas generated with Geographic Information System (GIS). GIS shape files are produced for each PCWS well and for the set of all PCWS wells in a county. WHPA delineations are conducted in response to the New Jersey Safe Drinking Water Act (N.J.S.A. 58:12A) and the New Jersey Safe Drinking Water Act Rules (N.J.A.C. 7:10) as most recently amended. The delineations are the first step in defining the sources of water to a public supply well. Within these areas, potential contamination will be assessed and appropriate monitoring will be undertaken as subsequent phases of the NJDEP SWAP. The Township may want to adopt specific ordinances to protect wellhead protection areas to minimize the infiltration of pollutants into its aquifers.

Aquifers are recharged and maintained by groundwater flows. Protecting the Township's groundwater recharge areas is essential to assure the quantity and quality of the Township's water resources. Figure 4 indicates the groundwater recharge areas in the Township. The NJDEP provides an estimation of ground-water recharge for New Jersey. Ground-water recharge is estimated using the NJGS methodology from NJ Geological Survey Report GSR-32 "A Method for Evaluation of Ground-Water-Recharge Areas in New Jersey. Land-use/land-cover, soil and municipality-based climatic data were combined and used to produce an estimate of ground-water recharge in inches/year. Recharge is then ranked by volume (billions of gallons/year) using natural breaks in the percentage of total volume.

The primary ground surface formation in Carneys Point Township is the Cohansey Sand formation and below it is the Kirkwood formation. It is from these two formations that the Potmac-Raritan-Magothy (PRM) aquifer is derived. This sole source aquifer is an unconfined aquifer and generally comprised of unconsolidated sands and gravels. The PRM aquifer is susceptible to contamination because of its characteristics and proximity to the ground surface. More than 75% of the freshwater supply in the Coastal Plain is drawn from this aquifer and it is the

most important supply of freshwater in the N.J. Coastal Plain. The PRM aquifer is the primary source of drinking water for Carneys Point Township.

Nitrate pollution is the principal threat to the Township's groundwater quality. Nitrate pollution derives from effluent loading from septic disposal fields and from excessively applied agricultural chemicals. High concentrations of nitrates may lead to adverse impacts on lakes and estuaries through the unnatural support of water borne vegetation. Secondary concerns for groundwater quality are "non-point" pollution from urban runoff and naturally occurring radium. The stormwater design and performance standards in this plan focus on protecting groundwater supplies and drinking water quality. (Carneys Point Township Master Plan, 2000).

RIVERS, STREAMS, AND WATER BODIES

There are twenty-one (21) Watershed Management Areas (WMA), designating the different watersheds in the State of New Jersey. Carneys Point Township lies entirely within Watershed Management Area 17, also known as the Maurice, Salem, and Cohansey Watershed Management Area. The Township can be divided into two main watersheds for the two primary waterways in the Township. The first watershed is the Delaware River Watershed which travels from the Northeast to Southwest through the Township from Whooping John Creek and Henby Creek to where it joins the Delaware River. The Salem River is the second watershed in Carneys Point Township. (See Township and Waterways Map, Figure 2)

The Salem River is another waterway in Carneys Point Township that flows into the Delaware River. Carneys Point is located partially within the Salem River's 110 square mile drainage area. The Salem River has been classified by the NJDEP Surface Water Quality Standards as a freshwater trout stocked stream.

Carneys Point Township also contains a number of large freshwater bodies which are found along the Delaware River and Salem River. The Delaware River has the Henby Creek and Whooping John Creek. The Salem Canal, Game Creek, Game Branch, and Two Penny Run make up the rest of Carneys Point Township and meet up with the Salem River which runs Northwest to Southeast. The Township's water bodies are indicated on the Base and Waterways Map.

The Carneys Point Township flood prone areas are associated with the waterways of the Delaware River, the Salem River and their tributaries. Flood prone areas provide a measurement of the danger or probability of flooding. Flooding results from the overflowing of a waterbody onto adjacent land and also can occur as the result of a rise in the water table. The areas adjacent to waterbodies that are at level or slightly higher elevations than the waterbody and that are subject to flooding and erosion are typically classified as flood prone areas.

Flood prone areas are classified as the 1% storm in any given year (100-year storm). Hazards in the flood prone areas are measured through determining the 100-year floodplains. The "flood hazard" area is composed of three parts: 1) the stream channel, which is the normal stream flow; 2) the floodway, which is the area on either side of the stream or waterbody which contains the fast-moving floodwaters of the 100-year storm; and 3) the flood fringe which are areas that are susceptible to a 100-year flood flow during a storm event.

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REFERENCES & NOTES:

Parcel mapping Taken from the 2019 Parcel Mapping Parcels and MOD-IV of Salem County, New Jersey State Plane NAD83.

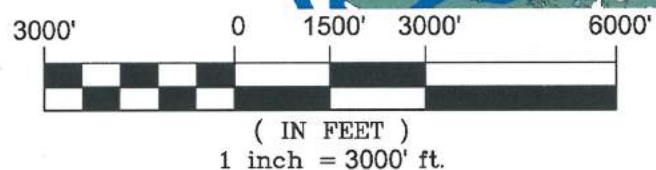
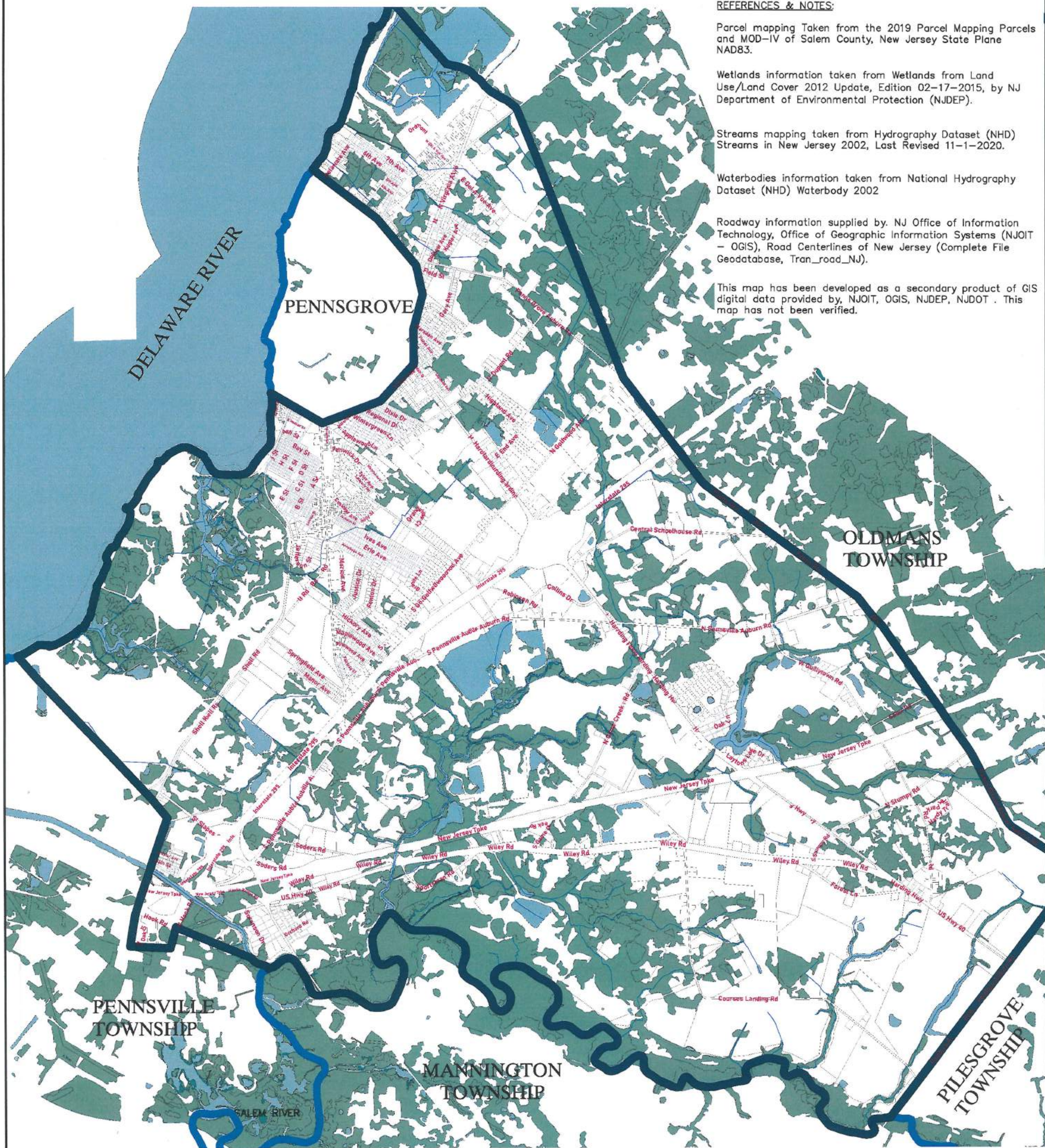
Wetlands information taken from Wetlands from Land Use/Land Cover 2012 Update, Edition 02-17-2015, by NJ Department of Environmental Protection (NJDEP).

Streams mapping taken from Hydrography Dataset (NHD) Streams in New Jersey 2002, Last Revised 11-1-2020.

Waterbodies information taken from National Hydrography Dataset (NHD) Waterbody 2002

Roadway information supplied by. NJ Office of Information Technology, Office of Geographic Information Systems (NJGIT - OGIS), Road Centerlines of New Jersey (Complete File Geodatabase, Tran_road_NJ).

This map has been developed as a secondary product of GIS digital data provided by, NJGIT, OGIS, NJDEP, NJDOT . This map has not been verified.



BASE AND WATERWAYS MAP
TOWNSHIP OF CARNEYS POINT
 TOWNSHIP OF CARNEYS POINT, SALEM GLOUCESTER COUNTY, NJ

| | |
|--|--|
| | SHERWOOD MEWS 833 KINGS HIGHWAY WOODBURY, NEW JERSEY 08096-3110 |
| | N.J. CERT. OF AUTHORIZATION GA27994900 856-848-6800 FAX 848-8520 |

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| LEGEND | |
|--------|-------------------|
| | STREAMS |
| | WETLANDS |
| | WATERBODIES |
| | CATEGORY 1 WATERS |

FIGURE 2
PG. 9

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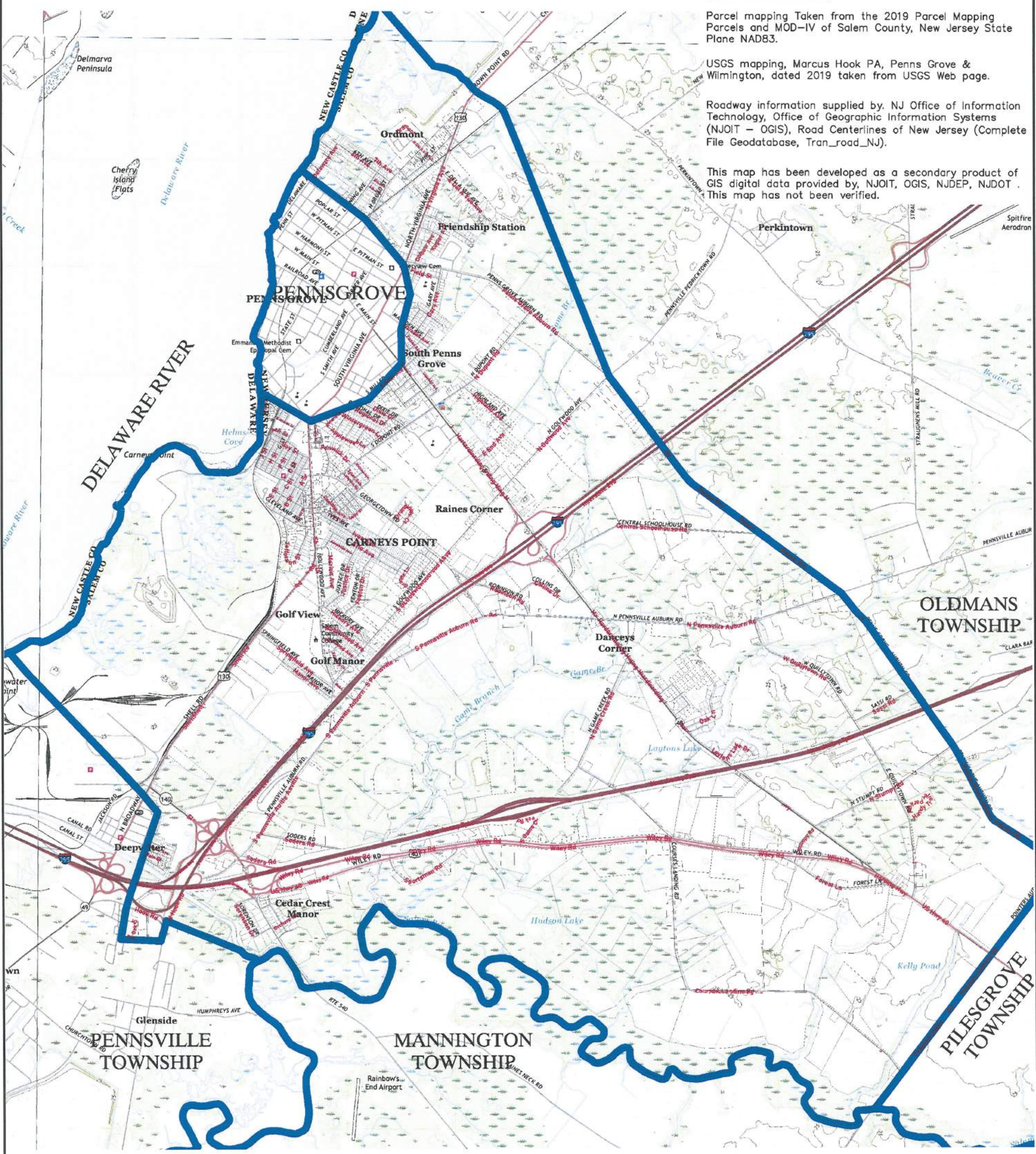
REFERENCES & NOTES:

Parcel mapping Taken from the 2019 Parcel Mapping Parcels and MOD-IV of Salem County, New Jersey State Plane NAD83.

USGS mapping, Marcus Hook PA, Penns Grove & Wilmington, dated 2019 taken from USGS Web page.

Roadway information supplied by NJ Office of Information Technology, Office of Geographic Information Systems (NJGIT - OGIS), Road Centerlines of New Jersey (Complete File Geodatabase, Tran_road_NJ).

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USGS MAP
TOWNSHIP OF CARNEYS POINT
 TOWNSHIP OF CARNEYS POINT, SALEM GLOUCESTER COUNTY, NJ

| | | | |
|--------------------------------------|--|--------------------|--|
| SICKELS & ASSOCIATES INC. | SHERWOOD MEWS 833 KINGS HIGHWAY WOODBURY, NEW JERSEY 08096-3110 | | |
| | N.J. CERT. OF AUTHORIZATION GA27994900 856-848-6800 FAX 848-8520 | | |
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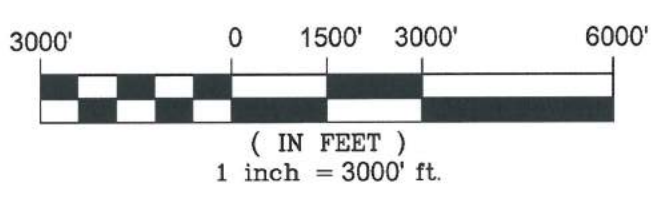


FIGURE 3
PG. 10

WATER QUALITY

Surface water quality standards and assessments throughout the State are provided by the NJDEP through the biological monitoring of freshwater systems. The Ambient Biomonitoring Network (AMNET) is one of the Department of Environmental Protection's major ongoing monitoring programs. This statewide network of over 800 stations employs sampling and taxonomic analysis of in-stream macroinvertebrate communities to assess the ecological condition at each station. Macroinvertebrates are larger than microscopic, primarily benthic (bottom-dwelling) fauna, which are generally ubiquitous in freshwater and estuarine environments, and play an integral role in the aquatic food web. Insects (largely immature forms) are especially characteristic of freshwaters; other major groups include worms, mollusks (snails, clams) and crustaceans (scuds, shrimp, crayfish, etc.). These bio-assessments utilize several community "biometrics", such as pollution tolerances of individual taxa; the product of this multi-metric analysis assigns one of three biological "impairment" levels rating a given site as non-impaired, moderately impaired or severely impaired. The results are considered reflective of the water or habitat quality at each site. AMNET data is also very useful for designation of category 1 waters based on exceptional ecological significance.

Results are reported separately for New Jersey's five major drainage basins or "Water Regions" (Upper and Lower Delaware, Northeast, Raritan and Atlantic), each encompassing several sub-basins ("Water Management Areas"). The Water Regions, with an average of 165 AMNET sites each, are sampled in consecutive years on a five-year rotational basis. Of 160 AMNET sites currently in the Lower Delaware Water Region, 13 (8.1%) were found "excellent", 35 (21.9%) "good", 80 (50%) "fair", and 32 (20%) "poor". Overall, the samples in the most recent round of testing were found to have improved from the previous round of testing. Appendix "B" includes a map of the AMNET Stations and impairment status of the Waterways as provided by the NJDEP. Specific AMNET Macroinvertebrate Data is included as collected from AMNET Stations located within the Township.

Biological impairment is manifested by alterations or differences in macroinvertebrate community structure, compared to a reference or "ideal" condition. In an impaired situation, species of pollution-tolerant groups (such as worms and midges) tend to dominate over pollution-intolerant forms (e.g. mayflies, stoneflies, etc.), with an overall depression in species diversity. Such discrepancies are typically due to degraded instream environmental conditions, which may be caused by various human activities or land uses and, in some cases, by natural features or events.

Inter-related human activities or practices, land uses, and natural features or events contributing to degraded stream quality:

1. Deforestation/development/construction (largely via runoff from non-point sources)
2. Urbanization/industrialization (largely via runoff from non-point sources)
3. Agricultural operations (largely via runoff from non-point sources)

4. Municipal or industrial wastewater discharge (from point source)
5. Artificial channelization or habitat alteration
6. Upstream impoundment, lake or pond
7. Drought conditions

Study results reflect that, human land uses and practices, superimposed on the undisturbed physical terrain, play a major role in controlling the degree of pollution or degradation in a stream system. (NJDEP, Ambient BioMonitoring Network Report, 2003).

Watershed Management Area Seventeen (#17) includes a total of 63 AMNET sites in the Maurice, Salem, and Cohansey River watersheds. The site data and results for WMA 17 indicate that 11.1% (seven sites) are "excellent", 23.8% (15 sites) are "good", 46% (29 sites) are "fair", and 19% (12 sites) are "poor". Comparing the current results to the earlier results, a significant improvement is seen at 12 sites and a significant decline at 19 sites.

In comparison to previous data, the number of "fair" and "poor" sites is slightly higher, the number of "good" sites has declined, and the number of "excellent" sites is the same. For the habitat scores, 80.9% received a suboptimal score, 15.9% received an optimal score, and 3.2% received a marginal score. Abnormalities were found at nine sites (two on Still Run and Indian Run and one each on Two Penny Run, Game Creek, Alloway Creek, Burnt Mill Run, and Muddy Run), with five of those sites displaying chronic abnormalities. The table below presents a synopsis AMNET data for WMA #17:

WMA #17 Combined Results - Table 1

| Bio Rating | Round 2 | | Round 3 | | Habitat Assessment | Round 3 | |
|-------------|---------|-------|---------|-------|--------------------|---------|-------|
| | | | | | | | |
| Excellent | 7 | 11.1% | 7 | 11.1% | Optimal | 10 | 15.9% |
| Good | 20 | 31.8% | 15 | 23.8% | Suboptimal | 51 | 80.9% |
| Fair | 26 | 41.3% | 29 | 46.0% | Marginal | 2 | 3.2% |
| Poor | 10 | 15.9% | 12 | 19.0% | Poor | --- | --- |
| Total Sites | 63 | | 63 | | | 63 | |

The municipality should develop a list of specific areas that are affected by stormwater quantity problems so that they can be addressed with Township projects or new land development activities/projects.

Information on Total Maximum Daily Loads (TMDL's) can be found and downloaded at the following link:

<https://www.nj.gov/dep/dwg/msrp-tmdl-rh.htm>

A TMDL is a “pollutant budget” for a given contaminant in a given waterway. The “TMDL Lookup Tool” at the link above contains a series of environmental reports that describe TMDL’s. The TMDL’s that have been identified in the Township are listed in the Plan Consistency section of this report. Each TMDL is listed along with the current status.

WETLANDS

Wetlands consist of areas that are inundated or saturated by surface water or groundwater at a frequency and duration to support a prevalence of vegetation typically adopted for life in saturated soil conditions, commonly known as hydrophytic vegetation. Wetlands are designated using a three-parameter approach evaluating hydrology, soils, and vegetation. Wetlands serve many important functions, including minimizing flooding and improving water quality. Wetlands also promote habitat for many species of wildlife including federal and state-listed endangered and/or threatened species.

Wetlands in Carneys Point Township are generally located along the riparian corridors of the rivers and streams, and occupy nineteen percent of Carneys Point Township lands. Carneys Point’s wetlands are primarily deciduous forested wetlands. Wetland areas buffer the water of the Delaware River and each of its tributaries including Henby Creek and Whooping John Creek. Wetland areas are also found along the Salem River and its tributaries; Game Creek, Game Branch, and Two Penny Run. The Township’s wetlands are located on the Township waterways map, Figure 2.

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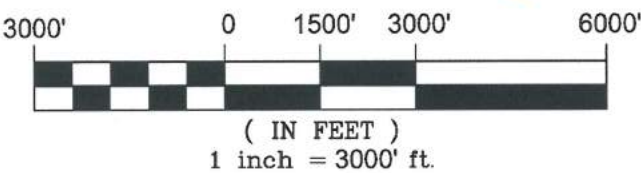
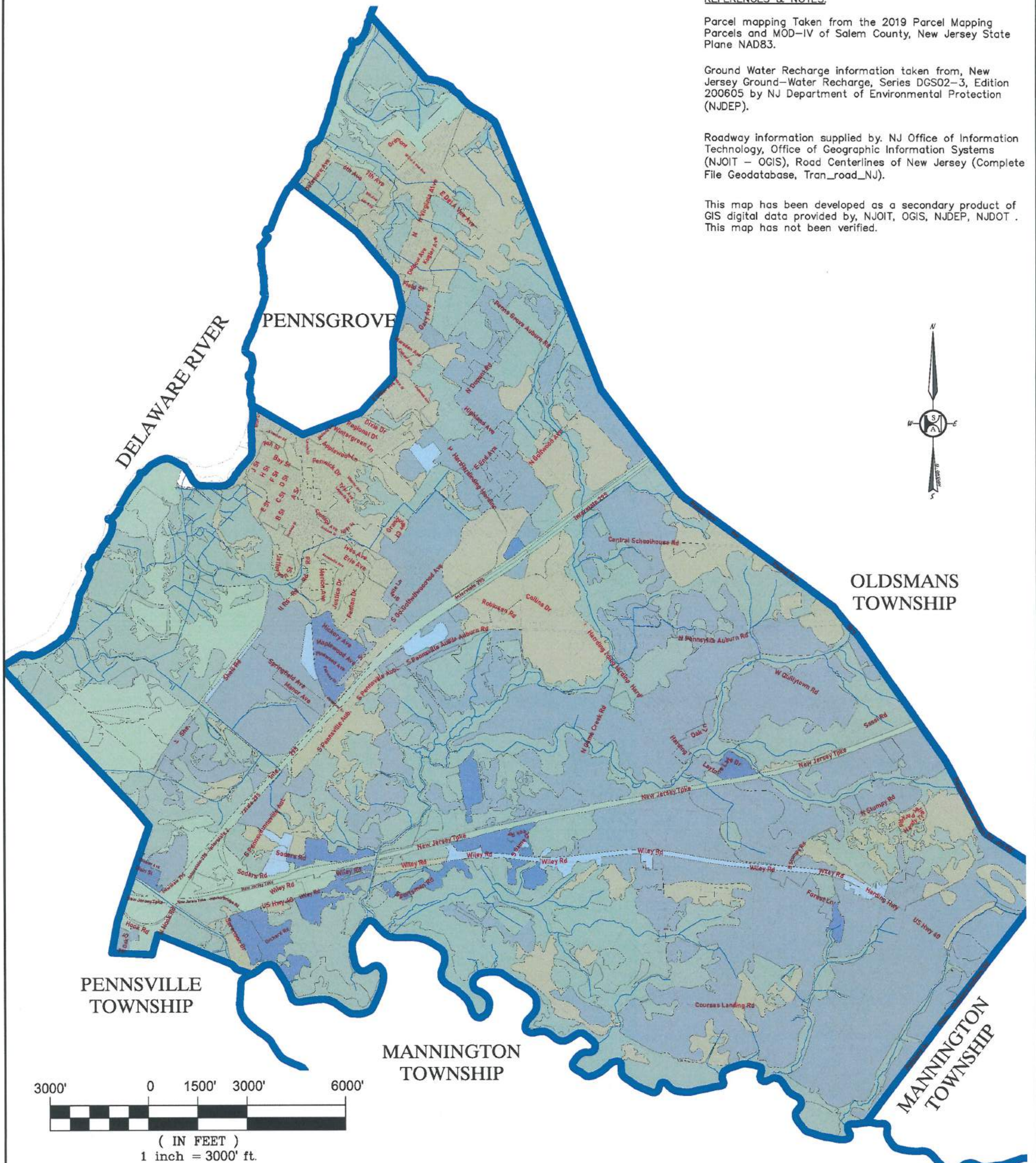
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Parcel mapping Taken from the 2019 Parcel Mapping Parcels and MOD-IV of Salem County, New Jersey State Plane NAD83.

Ground Water Recharge information taken from, New Jersey Ground-Water Recharge, Series DGS02-3, Edition 200605 by NJ Department of Environmental Protection (NJDEP).

Roadway information supplied by, NJ Office of Information Technology, Office of Geographic Information Systems (NJGIT - OGIS), Road Centerlines of New Jersey (Complete File Geodatabase, Tran_road_NJ).

This map has been developed as a secondary product of GIS digital data provided by, NJGIT, OGIS, NJDEP, NJDOT. This map has not been verified.



**GROUNDWATER RECHARGE MAP
TOWNSHIP OF CARNEYS POINT**

TOWNSHIP OF CARNEYS POINT, SALEM GLOUCESTER COUNTY, NJ

**SICKELS &
ASSOCIATES INC.**

SHERWOOD MEWS
833 KINGS HIGHWAY
WOODBURY, NEW JERSEY 08096-3110
N.J. CERT. OF AUTHORIZATION GA27994900
856-848-6800
FAX 848-8520

DRAWN BY : DJP DATE 3-12-21 SCALE :1" = 3000'
CHECKED BY : SAC FILE CP-043 SHEET DWG. NO.

| LEGEND | |
|----------------------|---|
| GROUNDWATER RECHARGE | |
| | 0 in/yr |
| | 1 to 7 in/yr |
| | 11 to 15 in/yr |
| | 8 to 10 in/yr |
| | hydric soil—no recharge calculated |
| | wetlands, open water—no recharge calculated |

FIGURE 4
PG. 14

REFERENCES & NOTES:

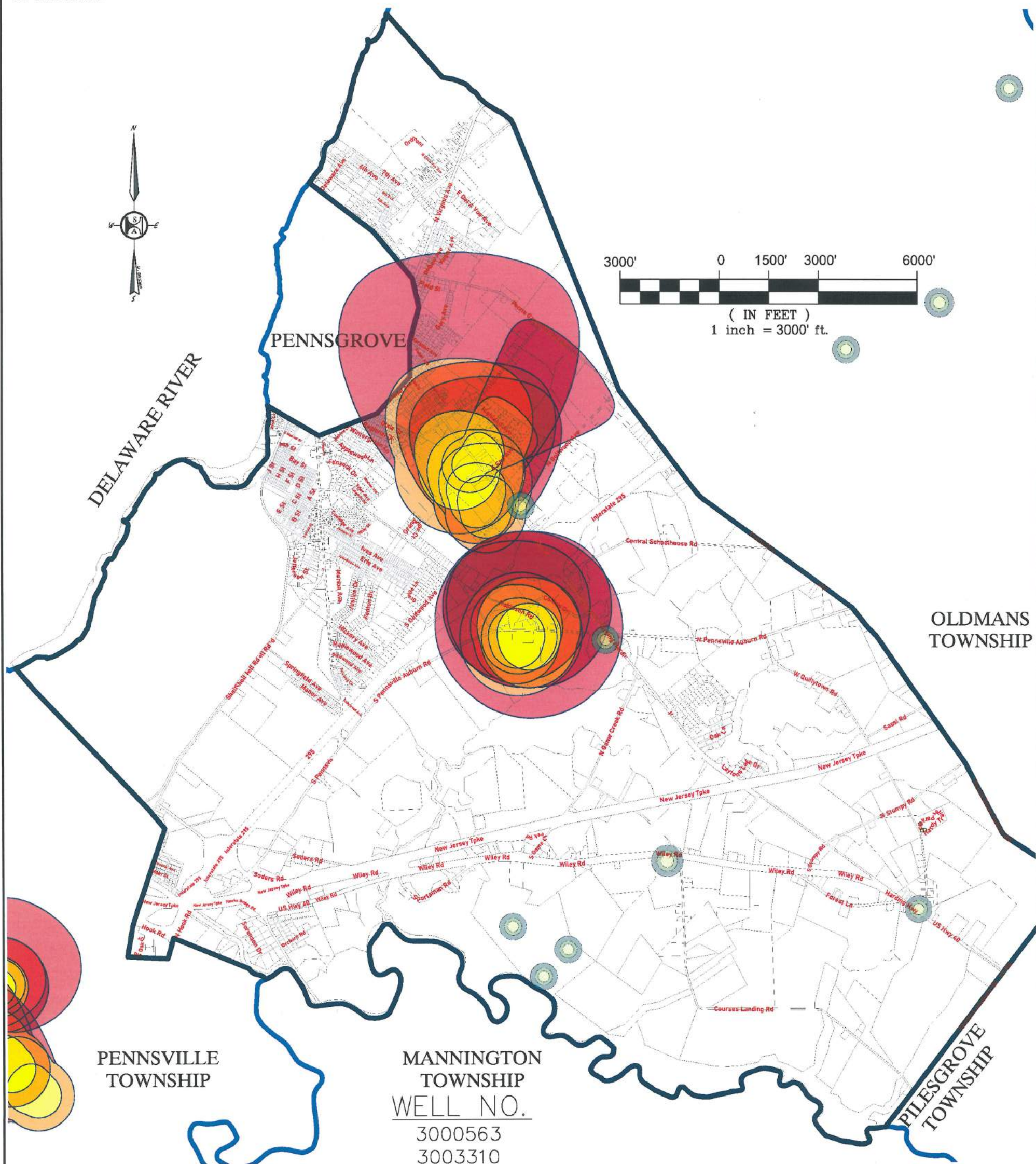
Parcel mapping Taken from the 2019 Parcel Mapping Parcels and MOD-IV of Salem County, New Jersey State Plane NAD83.

Roadway information supplied by NJ Office of Information Technology, Office of Geographic Information Systems (NJGIT - OGIS), Road Centerlines of New Jersey (Complete File Geodatabase, Tran_road_NJ).

Well Head Protection Areas: A Well Head Protection AREA (WHPA) in New Jersey is a map area calculated around a Public Community Water Supply (PCWS) well in New Jersey that delineates the horizontal extent of ground water captured by a well pumping at a specific rate over a two-, five-, and twelve-year period of time. The area of capture over two-, five-, and twelve-years is defined using line boundaries and polygon areas generated with Geographic Information System (GIS). GIS shape files are produced for each PCWS well and for the set of all PCWS wells in a county. WHPA delineations are conducted in response to the Safe Drinking Water Act Amendments of 1986 and 1996 as part of the Source Water Protection Program (SWAP). The delineations are the first step in defining the sources of water to a public supply well. Within these areas, potential contamination will be assessed and appropriate monitoring will be undertaken as subsequent phases of the NJEP SWAP.

This map has been developed as a secondary product of GIS digital data provided by, NJGIT, OGIS, NJDEP, NJDOT. This map has not been verified.

| REVISIONS | | | |
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| NO. | DATE | DESCRIPTION | BY |
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MANNINGTON TOWNSHIP WELL NO.

- 3000563
- 3003310
- 3008511
- 3003535
- 5000098
- 3001815
- 3001113
- 0000366
- 3014192
- 0000365

| | |
|----------------------------|--------------------------------|
| COMMUNITY WELL TIER | NON COMMUNITY WELL TIER |
| TIER 1 | TIER 1 |
| TIER 2 | TIER 2 |
| TIER 3 | TIER 3 |

WELL HEAD PROTECTION MAP
TOWNSHIP OF CARNEYS POINT
 TOWNSHIP OF CARNEYS POINT, SALEM GLOUCESTER COUNTY, NJ

SICKELS & ASSOCIATES INC.
 833 KINGS HIGHWAY
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DRAWN BY : DJP DATE 3-12-21 SCALE : 1" = 3000'
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FIGURE 5
PG. 15

NATURAL HERITAGE PRIORITY SITES & PROTECTED NATURAL AREAS

Carneys Point Township was evaluated for any natural heritage priority sites located in the Township. Natural Heritage Priority Sites identify occurrences of endangered and threatened species and the most suitable habitat for those species. This area in Carneys Point is preserved within New Jersey Natural Lands Trust (NLT).

In utilizing NJGeoWeb, there were no natural heritage priority sites found to be located within the Township. However, a review of the New Jersey Natural Lands Trust found the Game Branch Preserve to be located within Carneys Point Township. Additionally, an evaluation of the New Jersey and National Registers of Historic Places found the Dupont Chamber Works Facility and Deepwater Village Historic District (ID#5294) to be located within Carneys Point Township.

DESIGN AND PERFORMANCE STANDARDS

The Township's Stormwater NJPDES Permit requires the amendment or adoption of a Stormwater Control Ordinance that is in conformance with the Stormwater Management Rules at NJAC 7:8-5 and the provided model stormwater control ordinance provided by the NJDEP. A stormwater control ordinance was required to be amended or adopted by March 3, 2021. A copy of the adopted stormwater control ordinance is included in Appendix "A" (Ordinance 976, adopted February 3, 2021).

The Township has adopted the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The Township's Stormwater Management Control Ordinance was submitted to the Salem County Planning Board and the NJDEP Bureau of Non-Point Pollution Control after it was adopted by the Township.

The new Stormwater Management Rules provide a framework and incentives for managing runoff and resolving nonpoint source impairment on a drainage area basis for new development and redevelopment. The Stormwater Management Rules also include the requirements for green infrastructure to be implemented for major developments. The Stormwater Management Rules promote low impact site design techniques to maintain natural vegetation and drainage characteristics before incorporating structural Best Management Practices (BMP's).

Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these

strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.

The standards apply only to new major development and redevelopment and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. Major development is defined as the disturbance of one acre or more, the creation of one-quarter acre or more of regulated impervious surface, the creation of one-quarter acre or more of regulated motor vehicle surface, or the combination of regulated impervious surface and regulated motor vehicle surface totaling one-quarter acre or more. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a Regional Stormwater Management Plan or Water Quality Management Plan adopted in accordance with NJDEP Rules.

The Stormwater Management rules, N.J.A.C. 7:8 specify stormwater management standards that are mandatory for new major development and redevelopment. The New Jersey Stormwater Best Management Practices Manual (BMP manual) is developed to provide guidance to address the standards in the Stormwater Management Rules. The BMP manual provides examples of ways to meet the standards contained in the rule. The methods referenced in the BMP manual are one way of achieving the standards. The BMP Manual was developed by the New Jersey Department of Environmental Protection, in coordination with the New Jersey Department of Agriculture, the New Jersey Department of Community Affairs, the New Jersey Department of Transportation, municipal engineers, county engineers, consulting firms, contractors, and environmental organizations.

The Stormwater Management Standards for Major Development consist of the following:

- The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development (NJAC 7:8-5.8).
- Stormwater management measures shall avoid adverse impacts of stormwater runoff on habitat for threatened and endangered species (NJAC 7:8-5.2).
- The standards for water quality and groundwater recharge shall be met by incorporating green infrastructure strategies into the design (NJAC 7:8-5.3).
- Major development projects shall meet the groundwater recharge requirements (NJAC 7:8-5.4) through either:

Demonstrating through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or

Demonstrating through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the 2-year storm is infiltrated.

Hydraulic impact on the groundwater table must be reviewed. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems and other subsurface structures in the vicinity or down-gradient of the groundwater recharge area.

The groundwater recharge requirement does not apply to projects within the "urban-redevelopment area," or to projects subject to stormwater from areas of high pollutant loading or Industrial stormwater. Hydraulic impact on the groundwater table must be evaluated and the site shall be designed so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems and other subsurface structures in the vicinity or downgradient of the groundwater recharge area.

- Major development projects shall meet the stormwater runoff quantity requirements (NJAC 7:8-5.4) by completing one of the following:

Demonstrating through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction stormwater runoff for the two, 10, and 100-year storm events do not exceed, at any point in time, the pre-construction stormwater runoff for the same storm events; or

Demonstrating through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two, 10, and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site; or

Design stormwater management measures so that the post-construction peak runoff rates for the 2-, 10-, and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed.

- Major development projects shall meet the Stormwater quality requirements (NJAC 7:8-5.5) by designing:
- Stormwater management measures to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80 percent of the anticipated load from the developed site. Stormwater management measures shall only be required for water quality control if an additional $\frac{1}{4}$ acre of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in

a discharge specifically exempt under a NJPDES permit from this requirement. The water quality design storm is 1.25 inches of rainfall in two hours.

Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include nonstructural strategies and structural measures that optimize nutrient removal while still achieving the performance standards.

Special water resource protection areas and category one designated waters are required to maintain 300-foot buffers for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance and exceptional fisheries significance.

During construction, Township inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

PLAN CONSISTENCY

The Cumberland–Salem Conservation District (C.S.C.D.) with the New Jersey Department of Agriculture, State Soil Conservation Committee (SSCC) developed a Regional Stormwater Management Plan for the Lower Delaware River Watershed. This Plan does not appear to have been adopted. The Plan focuses mainly on the portion of the watershed that lies in Salem County. Upon adoption of the Township of Pittsgrove Stormwater Management Plan by the NJDEP, the Plan shall be adopted by the Township of Carneys Point and the requirements and Total Maximum Daily Loads (TMDL's) listed in the plan shall be implemented. The Township of Carneys Point's Stormwater Management Plan shall be consistent with the Upper Maurice Regional Stormwater Management Plan and any other Regional Stormwater Management Plan developed within the Township.

The overall objective of this Regional Stormwater Management Plan is to provide the stakeholders of the Delaware River Watershed the information and tools to finalize and adopt an implementable Regional Stormwater Management Plan (RSMP). This document is intended to provide planners, regulators, developers, landowners and other stakeholders with a current assessment of the Delaware River Watershed, with the information necessary to determine the desired condition, and with the tools to prepare a plan for achieving the desired condition. The report includes a detailed assessment, an evaluation of the needs of the watershed, a discussion of available management strategies, and information on the administrative process necessary to implement this plan.

The Salem River drains an area of 114 square miles and flows 32 miles from Upper Pittsgrove Township west to Deepwater, then South to the Delaware River. The area lies within Salem County, the major population center being Salem City. Much of the lower portions of the river are tidal. Major tributaries of the Salem River include Mannington Creek, Game Creek,

Majors Run, and Fenwick Creek. Land use in this watershed is about 40% cropland, with the rest woodland, tidal/freshwater marsh, urban, and pasture.

The Lower Delaware Watershed is in overall good condition. The streams and rivers are not significantly impacted by development and do not exhibit significantly degraded areas in regards to stream erosion, water quality, riparian buffer width, floodplain management, and wetlands quality. The watershed is not significantly impacted by stormwater at this time. However, to prevent degradation of the Salem River and to assure that it remains in its existing condition, steps to minimize the impacts of urbanization on this watershed are vital. To address these and other issues, a variety of management strategies are proposed.

The management strategies proposed for the Lower Delaware River Watershed include:

- Stormwater Recharge and Zoning-Based Recharge.
- Low Impact Development.
- Pre-Development Site Analysis.
- Adoption of DelMarVa Peak Rate Factor.
- Forest and Forest Buffers.
- Culvert Maintenance.
- Canada Goose Management.
- Lake and Pond Management and Maintenance.

The goals of the management strategies should include:

- Maintaining base flow in all river segments.
- Prevent stream and streambank erosion and degradation.
- Prevent the silting of the lakes and ponds in the watershed.
- Maintaining the natural hydrologic processes.
- Maintaining or improving the overall water quality of the lakes and streams.

A total of 13 TMDLs (Total Maximum Daily Loads) of pollutants are identified on NJGeoWeb for waters within the Township, as listed below. A separate TMDL calculation must be prepared for each pollutant listed for each impaired stream segment or lake. A TMDL is considered "proposed" when the NJDEP publishes the TMDL Report as a proposed Water Quality Management Plan Amendment in the New Jersey Register (NJR) for public review and comment. A TMDL is considered "established" when the NJDEP finalizes the TMDL Report and formally submits it to EPA Region 2 for a thirty (30)-day review and approval. The TMDL is considered "approved" when the NJDEP-established TMDL is approved by EPA Region 2. The

TMDL is considered "adopted" when the EPA-approved TMDL is adopted by the NJDEP as a water quality management plan amendment and the adoption notice is published in the NJR.

1. Wasteload Allocations for Volatile Organics and Toxicity: Phase I TMDLs for Toxic Pollutants in the Delaware River Estuary

- a. Status: Adopted 2003
- b. Site: LDRV tribs (Lakeview Ave to Oldmans Creek)
- c. Parameter: Volatile Organic Compounds (VOCs)

2. Total Maximum Daily Loads for Polychlorinated Biphenyls (PCBs) for Zones 2 - 5 of the Tidal Delaware River

- a. Status: Established 2003
- b. Site: LDRV tribs (Lakeview Ave to Oldmans Creek)
- c. Parameter: Polychlorinated Biphenyls (PCBs)

3. Wasteload Allocations for Volatile Organics and Toxicity: Phase I TMDLs for Toxic Pollutants in the Delaware River Estuary

- a. Status: Adopted 2003
- b. Site: Game Creek (below Rt. 48)
- c. Parameter: Volatile Organic Compounds (VOCs)

4. Total Maximum Daily Loads for Polychlorinated Biphenyls (PCBs) for Zones 2 - 5 of the Tidal Delaware River

- a. Status: Established 2003
- b. Site: Game Creek (below Rt. 48)
- c. Parameter: Polychlorinated Biphenyls (PCBs)

5. Total Maximum Daily Loads for Polychlorinated Biphenyls (PCBs) for Zones 2 - 5 of the Tidal Delaware River

- a. Status: Established 2003
- b. Site: Game Creek (above Rt. 48)
- c. Parameter: Polychlorinated Biphenyls (PCBs)

6. Wasteload Allocations for Volatile Organics and Toxicity: Phase I TMDLs for Toxic Pollutants in the Delaware River Estuary

- a. Status: Adopted 2003
- b. Site: Game Creek (above Rt. 48)
- c. Parameter: Volatile Organic Compounds (VOCs)

7. Total Maximum Daily Load for Mercury Impairments Based on Concentration in Fish Tissue Caused Mainly by Air Deposition to Address 122 HUC 14s Statewide

- a. Status: Amended 2020
- b. Site: Salem River (39-40-14 dam – Courses Landing)
- c. Parameter: Mercury

8. Wasteload Allocations for Volatile Organics and Toxicity: Phase I TMDLs for Toxic Pollutants in the Delaware River Estuary

- a. Status: Adopted 2003
- b. Site: Salem River (39-40-14 dam – Courses Landing)
- c. Parameter: Volatile Organic Compounds (VOCs)

9. Total Maximum Daily Loads for Polychlorinated Biphenyls (PCBs) for Zones 2 - 5 of the Tidal Delaware River

- a. Status: Established 2003
- b. Site: Salem River (39-40-14 dam – Courses Landing)
- c. Parameter: Polychlorinated Biphenyls (PCBs)

10. Wasteload Allocations for Volatile Organics and Toxicity: Phase I TMDLs for Toxic Pollutants in the Delaware River Estuary

- a. Status: Adopted 2003
- b. Site: Salem Canal
- c. Parameter: Volatile Organic Compounds (VOCs)

11. Total Maximum Daily Loads for Polychlorinated Biphenyls (PCBs) for Zones 2 - 5 of the Tidal Delaware River

- a. Status: Established 2003

- b. Site: Salem Canal
- c. Parameter: Polychlorinated Biphenyls (PCBs)

The Pennsville Township Stormwater Management Plan is consistent with the N.J. Residential Site Improvement Standards (NJRSIS) at N.J.A.C. 5:21. The municipality will utilize the most current update of the NJRSIS in the stormwater management review of residential areas. The Stormwater Management Plan will be updated to be consistent with any future updates to the NJRSIS.

The Township has adopted a Stormwater Control Ordinance in accordance with the Stormwater Management Rules (N.J.A.C. 7:8) and the stormwater control ordinance provided by the NJDEP. The stormwater management ordinance requires that all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Township inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the Salem/Cumberland County Soil Conservation District.

NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

Application of Non-Structural Stormwater Management Strategies is required by the Stormwater Control Ordinance. Low impact development entails utilizing strategies to minimize or eliminate the adverse impacts of development on the environment and the Township's natural features. These strategies are intended to reduce and/or prevent adverse stormwater runoff impacts through sound site planning and both non-structural and structural techniques that preserves the predeveloped conditions of the site. Green Infrastructure BMP's are part of the non-structural goals and must be used as described in the current Stormwater Control Ordinance. Nonstructural stormwater management strategies incorporated into site design shall:

- Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;
- Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;
- Maximize the protection of natural drainage features and vegetation;
- Minimize the decrease in the "time of concentration" from pre-construction to post construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;
- Minimize land disturbance including clearing and grading;
- Minimize soil compaction;
- Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;

- Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;
- Provide other source controls to prevent or minimize the use or exposure of pollutants from development sites in order to prevent or minimize the release of those pollutants into stormwater runoff. These source controls include, but are not limited to:
 - Development design features that help to prevent accumulation of trash and debris in drainage systems;
 - Development design features that help to prevent discharge of trash and debris from drainage systems;
 - Development design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrials or commercial developments; and
 - When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.

In addition to the design and performance standards for nonstructural strategies, the municipal stormwater management plan must provide a review and evaluation to determine how the Township's Master plan and Land Development Ordinances should be amended to implement the principles of nonstructural stormwater management. Municipalities are required to evaluate the municipal master plan, and land use and zoning ordinances to determine what adjustments need to be made to allow the implementation of nonstructural stormwater management measures, also called low impact development techniques.

The Rules of N.J.A.C. 7:15 require a review of the Township's Master Plan. The Carneys Point Township Master Plan, adopted December 18, 2000, provides a detailed analysis of the Township and its goals and objectives. The Township Master Plan contains a conservation element and a natural resources inventory. The Plan identifies the importance of land use standards to protect the environment and the importance of open space and preservation. The Carneys Point Township Master Plan is consistent with the goals of the NJDEP Stormwater Management Rules and Regulations.

The Master Plan is dated December 18, 2000 with a re-examination dated April 11, 2014. The Master Plan addresses the goals of the Municipal Stormwater Management Plan by identification of the significant wetlands-constrained land in the Township. Wetlands are also referenced in the Utilities Plan Element and the Conservation Plan Element. The next re-examination should incorporate the latest N.J.A.C. 7:8 provisions.

The Carneys Point Township Land Development Regulations Ordinance has been reviewed for consistency with the strategies for low impact development as required by the Stormwater Management Rules at N.J.A.C. 7:8-4. This evaluation has been conducted to determine what adjustments need to be made to allow the implementation of non-structural stormwater management techniques and green infrastructure. The following list contains the

existing ordinance regulations that promote low impact development and a list of recommended modifications that are in **bold**. The ordinance identified for revision shall be reviewed and assessed by the Township. Upon completion of the revisions to the land development ordinances, the attached sections shall be submitted to the County Review Agency for review. A copy shall also be sent to the NJDEP at the time of submission.

The consideration for and preservation of existing and proposed vegetation can provide protection against adverse impacts of stormwater runoff. Regulations should include requirements to preserve existing vegetated areas, minimize turf grass lawn areas, and use native vegetation. Minimizing Land Disturbance - The goal is to limit clearing, grading and other disturbance associated with development to protect existing features that provide stormwater benefits. Heavy construction vehicles should be limited to specific areas, such as proposed roadways. The intent is to minimize compaction of the soils. These areas should be required to be identified on the plans and marked in the field. The maximum setbacks for these areas, recommended for low impact development designs are: front yard 20 feet, rear yard – 25 feet; side yards = 8 feet. Impervious Area Management – The amount of impervious area and its relationship to adjacent vegetated areas, can significantly change the amount of runoff that needs to be addressed by BMP's. Most of a site's impervious substances are typically located in the streets, sidewalks, driveways, rooftops and parking areas. Street widths of 18 to 22 feet are recommended for low impact development designs in low density residential developments. Minimum driveway width of 9 and 18 feet for one lane and two lanes respectively are also recommended. The use of vegetated channels, rather than standard concrete curb and gutters, can decrease stormwater flow velocity and allow for stormwater filtration and re-infiltration. A design option is to allow vegetated channels to convey smaller storm events and provide an overflow into a stormwater system for larger storm events.

Section 185-30 Landscaping - Implements restrictions on clearing and grading activities to protect the existing habitat and water quality. All plans for development are required to submit a Landscaping Plan indicating the clearing limit, existing vegetation and location and identification of proposed trees and shrubs. This requirement incorporates limitations on lawn and turf areas to those specifically intended for active human use such as play fields, golf courses and lawns associated with a residence or other principal non-residential use. Existing wooded areas shall not be cleared and converted to lawns except when directly associated with and adjacent to a proposed structure. **The ordinance should include language to promote or provide incentives for the use of vegetation as filters for stormwater runoff.**

Section 185-28A Wetlands – As defined in Section 404, federal Water pollution Control Act Amendments of 1972, delineated on wetlands maps prepared by the United States Fish and Wildlife service, and or N.J.A.C. 7:7A, the New Jersey Freshwater Protection Act Rules, field verified by an on-site inspection.

Section 185-28B Significant Trees – As defined by the ordinance to which trees are to be preserved along with rare types of species where possible.

Section 185-28C Floodways or V-zones – Lands identified by floodways or V-zones on the current flood Insurance rate maps "FIRM".

Section 185-28E Endangered Wildlife – As shown and identified on federal or state lists

Section 185-28F Historic Structures and Sites - The purpose and intent of this section is to prevent excessive and unsafe development in areas deemed to be historically.

Section 185-27B Drainage and Conservation Easements - If the property Plans are required to be submitted that depict the existing conditions, environmentally critical and environmentally constrained areas.

Section 185-25F(2) Conservation/Recreation Areas - Areas to be deeded to the municipality and held in its natural states.

Section 185-24 Sidewalks - This section should be revised to allow for sidewalks to be constructed with pervious or porous material.

Section 185-22 Curbs – This section should be revised to allow or require vegetated open channel conveyance instead of the standard curb and gutters. Design criteria for vegetated channels should be discussed and included.

Article VII of the Township Code entitled “Zoning –Chapter 212” has been reviewed for LID strategies. The Township is divided into the following zoning districts, differentiated according to use, area and bulk requirements:

AG – Agricultural District

RR-1 – Rural Residential 1 District

RR-2 – Rural Residential 2 District

LR – Low-Density Residential District

MHR – Medium-High Density Residential District

HR – High-Density Residential District

LC – Light Commercial District

GC – General Commercial District

GC-R – General Commercial-Redevelopment District

LI – Light Industrial District

LI-R – Light Industrial-Redevelopment District

GI-R – General Industrial-Redevelopment District

IC – Interchange Commercial District

OS – Open Space District

IA-1 – Inclusionary Apartment Residential 1 District

IA-2 – Inclusionary Apartment 2 Overlay District

IF – Inclusionary Family Residence Overlay District

Although each zone has a maximum allowable percent impervious surface, the Township Code should remind developers that satisfying the percent impervious requirements does not relieve them of responsibility for complying with the Design and Performance Standards for Stormwater Management Measures. The Township should evaluate the maximum allowable impervious cover for each zone to determine whether a reduction in impervious cover is appropriate. The Township should evaluate a maximum percent of disturbance for each zone for those areas identified as natural features. Also, if a developer is given a variance to exceed the maximum allowable percent imperviousness, the developer must be required to mitigate the impact of the additional impervious surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge. A detailed description of how to develop a mitigation plan is included in this Municipal Stormwater Management Plan.

Land Use/Build-Out Analysis

NJAC 7:8-4.2 requires that the stormwater management plan include a land use/build-out analysis. A build-out analysis allows the Township to project future development or redevelopment based on existing zoning and land use regulations. For each HUC 14 in the Township, the full development impervious cover and the anticipated pollutant loading is provided. A detailed land use build-out analysis for the Township was conducted. Figure 6 illustrates the existing land use in the Township based on 2019 GIS information from NJDEP. Figure 7 illustrates the HUC14s within the Township. HUC 14s are 14-digit Hydrologic Unit Codes assigned to small watersheds by the United States Geological Survey (USGS). These codes are used in the organization and assessment of the associated watersheds. The Township zoning map is shown in Figure 8. Figure 2 (located in the Background section) illustrates the constrained lands within the Township. Constrained lands consist of land areas that are undevelopable or that contain physical and/or environmental constrictions. This would be the waterways and wetlands shown in Figure 2.

The build-out calculations for impervious cover are shown in Table 2. Table 3 presents the pollutant loading coefficients by land cover as provided by NJDEP. The pollutant loads at full build-out are presented in Table 4. It is important to note that, although the pollutant loads for agricultural lands are higher than those for low density residential for the parameters in Table 3, converting agricultural lands to residential typically results in an increase in pollutant loads for metals and petroleum hydrocarbons. Also, total suspended solids loads due to stormwater runoff may decrease due to the conversion of agricultural lands to low density residential, but the percentage of impervious surfaces increases dramatically. If, due to the increase of impervious surfaces, increases in stormwater runoff flows are not managed properly, these high flows will increase streambank erosion, thereby increasing sediment loads to the receiving

waters. The existing impervious coverages were estimated based on the 2019 GIS information from NJDEP. The coverages include roadways which contributes to the total impervious coverage when compared to the allowable impervious which is based on the zoning bulk standards.

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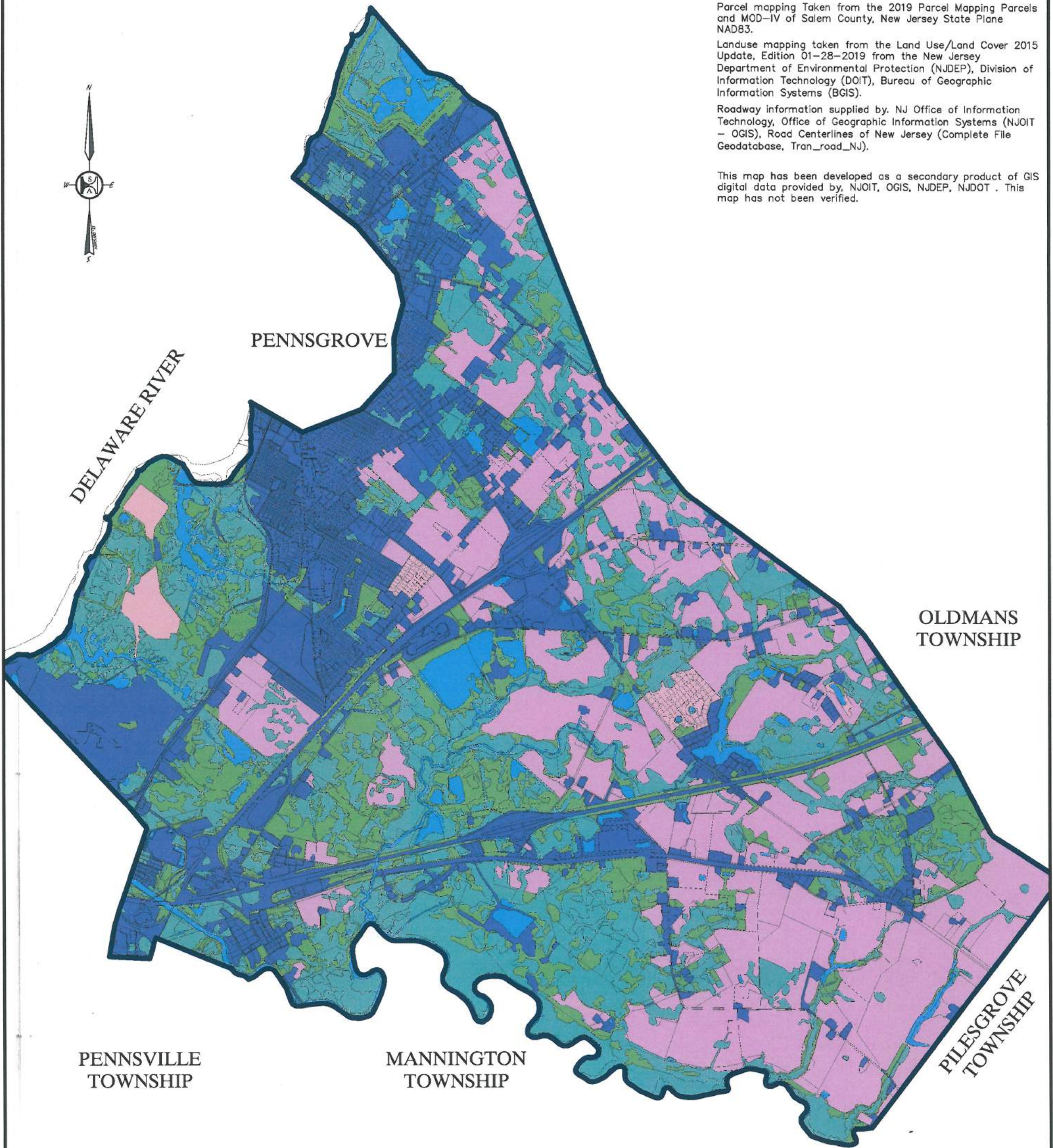
REFERENCES & NOTES:

Parcel mapping Taken from the 2019 Parcel Mapping Parcels and MOD-IV of Salem County, New Jersey State Plane NAD83.

Landuse mapping taken from the Land Use/Land Cover 2015 Update, Edition 01-28-2019 from the New Jersey Department of Environmental Protection (NJDEP), Division of Information Technology (DOIT), Bureau of Geographic Information Systems (BGIS).

Roadway information supplied by NJ Office of Information Technology, Office of Geographic Information Systems (NJGIT - OGIS), Road Centerlines of New Jersey (Complete File Geodatabase, Tran_road_NJ).

This map has been developed as a secondary product of GIS digital data provided by, NJGIT, OGIS, NJDEP, NJDOT. This map has not been verified.



LANDUSE MAP
TOWNSHIP OF CARNEYS POINT

TOWNSHIP OF CARNEYS POINT, SALEM GLOUCESTER COUNTY, NJ

| | |
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| SICKELS & ASSOCIATES INC. | SHERWOOD MEWS 833 KINGS HIGHWAY WOODBURY, NEW JERSEY 08096-3110 |
| | N.J. CERT. OF AUTHORIZATION GA27994900 856-848-6800 FAX 848-8520 |

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| DRAWN BY : DJP | DATE 3-12-21 | SCALE :1" = 3000' |
| CHECKED BY : SAC | FILE CP-043 | SHEET |
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| LEGEND | |
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| LANDUSE | |
| | AGRICULTURE |
| | BARREN LAND |
| | FOREST |
| | URBAN |
| | WATER |
| | WETLANDS |

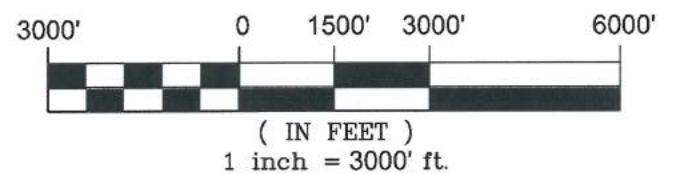


FIGURE 6
PG. 29

| REVISIONS | | | |
|-----------|------|-------------|----|
| NO. | DATE | DESCRIPTION | BY |
| | | | |

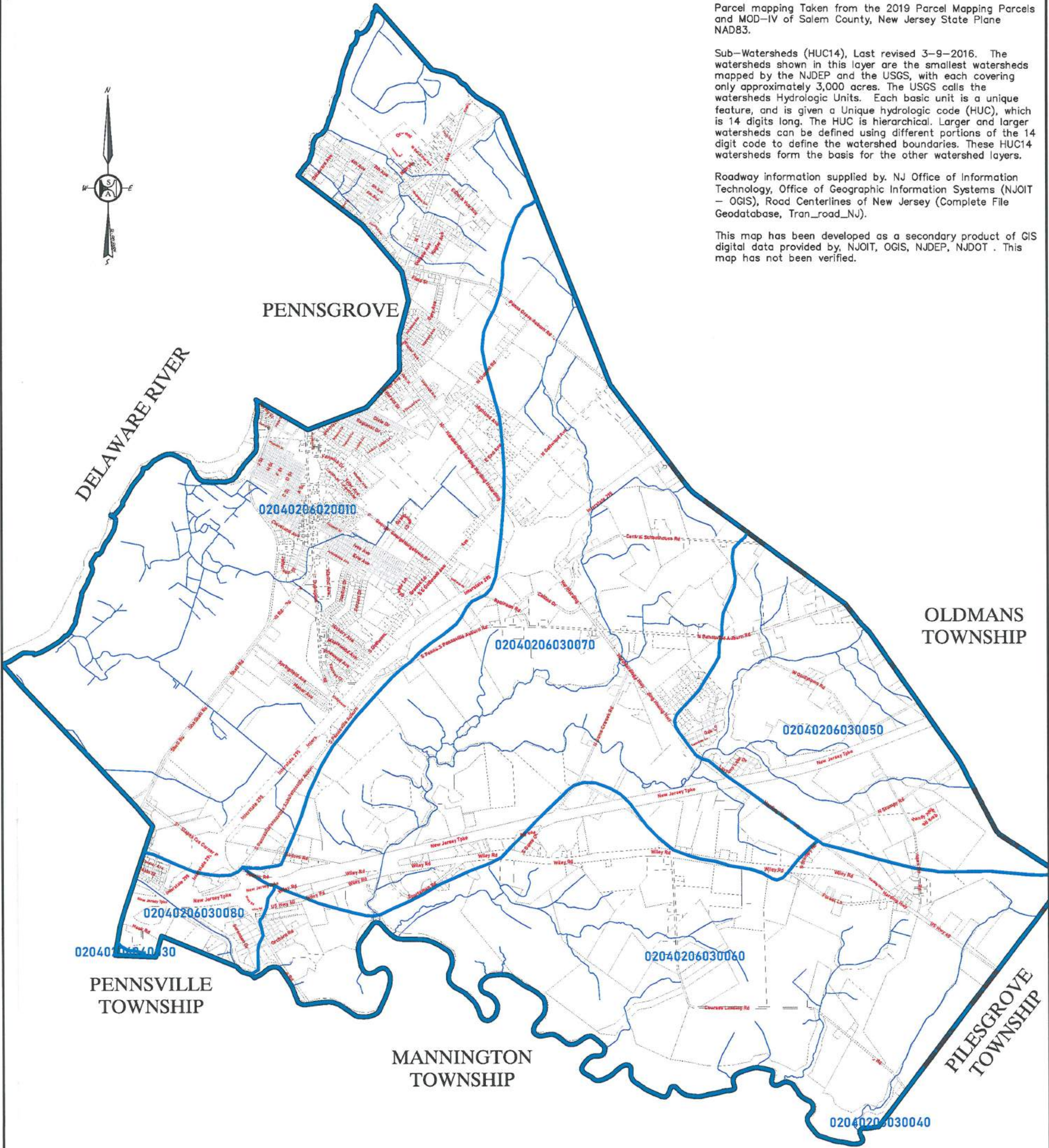
REFERENCES & NOTES:

Parcel mapping Taken from the 2019 Parcel Mapping Parcels and MOD-IV of Salem County, New Jersey State Plane NAD83.

Sub-Watersheds (HUC14), Last revised 3-9-2016. The watersheds shown in this layer are the smallest watersheds mapped by the NJDEP and the USGS, with each covering only approximately 3,000 acres. The USGS calls the watersheds Hydrologic Units. Each basic unit is a unique feature, and is given a Unique hydrologic code (HUC), which is 14 digits long. The HUC is hierarchical. Larger and larger watersheds can be defined using different portions of the 14 digit code to define the watershed boundaries. These HUC14 watersheds form the basis for the other watershed layers.

Roadway information supplied by NJ Office of Information Technology, Office of Geographic Information Systems (NJGIT - OGIS), Road Centerlines of New Jersey (Complete File Geodatabase, Tran_road_NJ).

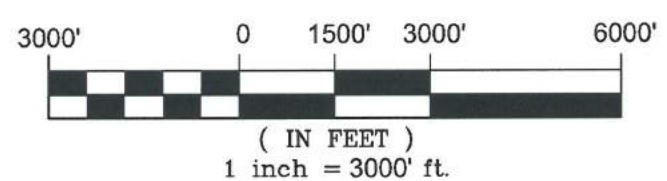
This map has been developed as a secondary product of GIS digital data provided by, NJGIT, OGIS, NJDEP, NJDOT. This map has not been verified.



HYDROLOGIC UNITS (HUC 14) MAP
TOWNSHIP OF CARNEYS POINT
 TOWNSHIP OF CARNEYS POINT, SALEM GLOUCESTER COUNTY, NJ

| | |
|--|--|
| | SHERWOOD MEWS 833 KINGS HIGHWAY WOODBURY, NEW JERSEY 08096-3110 |
| | N.J. CERT. OF AUTHORIZATION GA27994900 856-848-6800 FAX 848-8520 |

| | | |
|------------------------------|--------------|--------------------|
| DRAWN BY : DJP | DATE 3-12-21 | SCALE : 1" = 3000' |
| CHECKED BY : SAC FILE CP-043 | SHEET | DWG. NO. |



REFERENCES & NOTES:

Parcel mapping Taken from the 2019 Parcel Mapping Parcels and MOD-IV of Salem County, New Jersey State Plane NAD83.

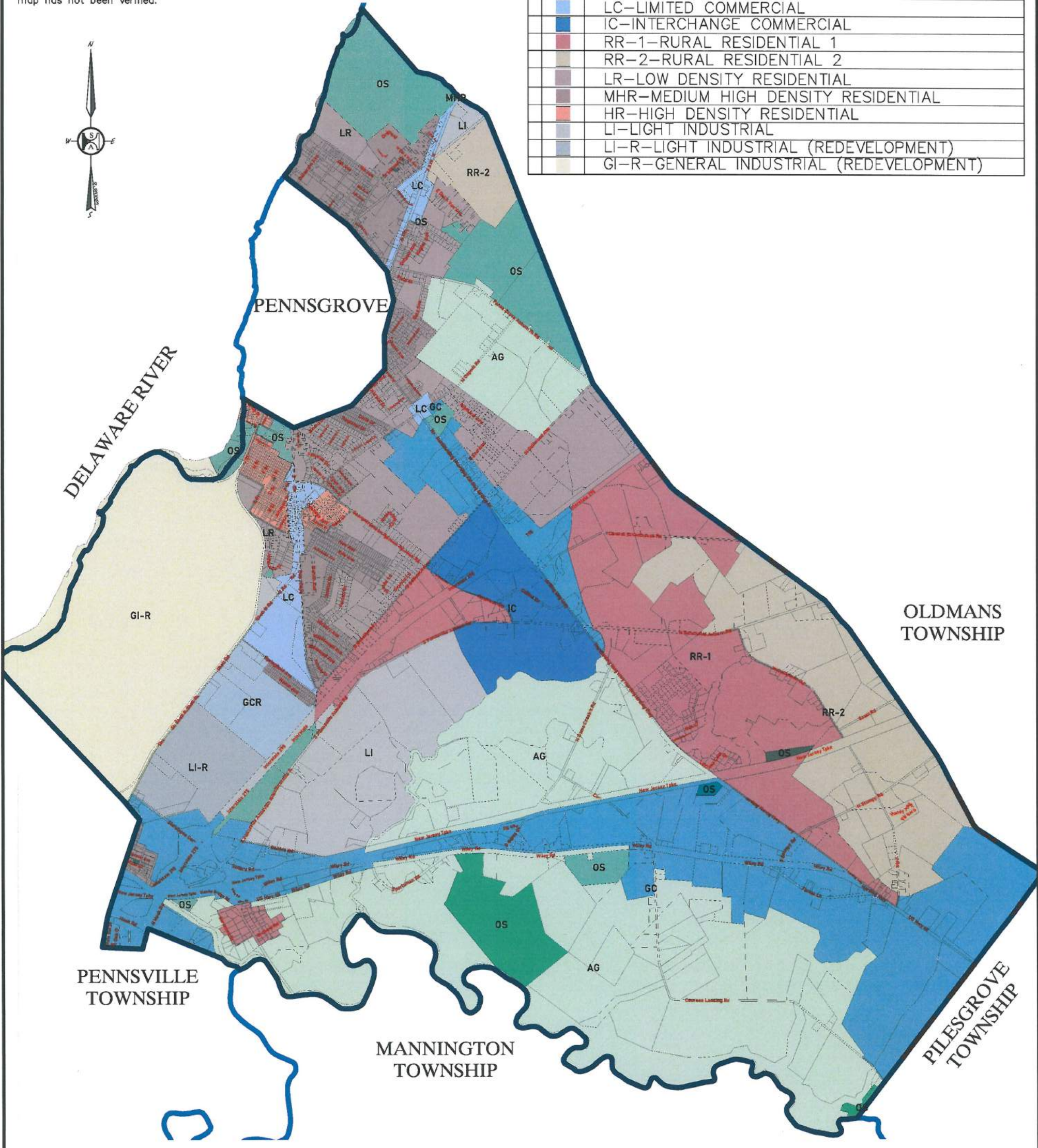
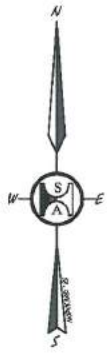
Zoning areas based upon Township of Carneys Point Zoning Map as by Ron Rukenstein & Associates, dated 3-1-06, revised 6-9-12.

Roadway information supplied by: NJ Office of Information Technology, Office of Geographic Information Systems (NJGIT - OGIS), Road Centerlines of New Jersey (Complete File Geodatabase, Tran_road_NJ).

This map has been developed as a secondary product of GIS digital data provided by, NJGIT, OGIS, NJDEP, NJDOT. This map has not been verified.

| REVISIONS | | |
|-----------|------|-------------|
| NO. | DATE | DESCRIPTION |
| | | |
| | | |

| LEGEND | |
|--------|---|
| ZONING | |
| | AG-AGRICULTURE |
| | OS-OPEN SPACE |
| | GC-GENERAL COMMERCIAL |
| | GCR-GENERAL COMMERCIAL (REDEVELOPMENT) |
| | LC-LIMITED COMMERCIAL |
| | IC-INTERCHANGE COMMERCIAL |
| | RR-1-RURAL RESIDENTIAL 1 |
| | RR-2-RURAL RESIDENTIAL 2 |
| | LR-LOW DENSITY RESIDENTIAL |
| | MHR-MEDIUM HIGH DENSITY RESIDENTIAL |
| | HR-HIGH DENSITY RESIDENTIAL |
| | LI-LIGHT INDUSTRIAL |
| | LI-R-LIGHT INDUSTRIAL (REDEVELOPMENT) |
| | GI-R-GENERAL INDUSTRIAL (REDEVELOPMENT) |



EXISTING ZONING MAP
TOWNSHIP OF CARNEYS POINT
 TOWNSHIP OF CARNEYS POINT, SALEM GLOUCESTER COUNTY, NJ

| | |
|--|--|
| | SHERWOOD MEWS 833 KINGS HIGHWAY WOODBURY, NEW JERSEY 08096-3110 |
| | N.J. CERT. OF AUTHORIZATION GA27994900 856-848-6800 FAX 848-8520 |
| DRAWN BY : DJP CHECKED BY : SAC FILE CP-043 | DATE 3-12-21 SHEET |
| SCALE : 1" = 3000' DWG. NO. | DATE 3-12-21 SHEET |

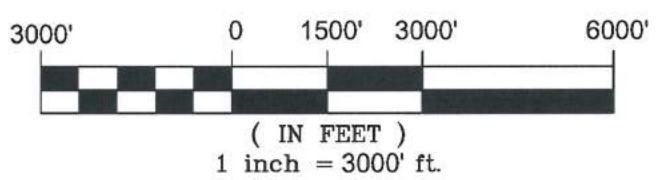


FIGURE 8
PG. 31

| Table 2: Build-Out Calculations for each HUC14 | | | | | | | |
|--|-----------------|-------------------------|--------------------------|--------------------------|-----------------------|--------------------------|---------------------------|
| HUC14 & ZONE | TOTAL AREA (AC) | EXISTING IMPERVIOUS (%) | EXISTING IMPERVIOUS (AC) | WETLANDS/WATER AREA (AC) | DEVELOPABLE AREA (AC) | ALLOWABLE IMPERVIOUS (%) | BUILD-OUT IMPERVIOUS (AC) |
| 0204020620010 | | | | | | | |
| AG | 103.14 | 5.13% | 5.29 | 40.70 | 62.44 | 15% | 9.37 |
| GC | 238.73 | 37.16% | 88.70 | 64.20 | 174.53 | 30% | 52.36 |
| GCR | 146.90 | 10.74% | 15.78 | 23.90 | 123.00 | 30% | 36.90 |
| GI-R | 1115.89 | 15.34% | 171.14 | 606.60 | 509.29 | 40% | 203.72 |
| HR | 101.84 | 45.57% | 46.41 | 76.10 | 25.74 | 30% | 7.72 |
| IC | 60.62 | 34.88% | 21.14 | 0.00 | 60.62 | 40% | 24.25 |
| LC | 175.57 | 37.13% | 65.18 | 4.70 | 170.87 | 30% | 51.26 |
| LI | 123.34 | 20.53% | 25.32 | 25.30 | 98.04 | 30% | 29.41 |
| LI-R | 190.94 | 16.50% | 31.50 | 98.30 | 92.64 | 30% | 27.79 |
| LR | 666.34 | 31.38% | 209.11 | 170.20 | 496.14 | 25% | 124.04 |
| MHR | 473.43 | 39.48% | 186.93 | 75.70 | 397.73 | 25% | 99.43 |
| OS | 353.48 | 8.39% | 29.67 | 322.20 | 31.28 | 0% | 0.00 |
| RR-1 | 134.04 | 36.30% | 48.66 | 8.40 | 125.64 | 20% | 25.13 |
| RR-2 | 109.55 | 1.92% | 2.11 | 25.60 | 83.95 | 20% | 16.79 |
| TOTALS: | 3993.82 | | 946.95 | 1541.90 | 2451.92 | | 708.16 |
| 02040206030050 | | | | | | | |
| AG | 1.59 | 33.37% | 0.53 | 0.00 | 1.59 | 15% | 0.24 |
| GC | 49.67 | 3.42% | 1.70 | 0.00 | 49.67 | 30% | 14.90 |
| OS | 7.48 | 0.01% | 0.00 | 6.50 | 0.98 | 0% | 0.00 |
| RR-1 | 458.62 | 10.16% | 46.57 | 148.40 | 310.22 | 20% | 62.04 |
| RR-2 | 702.27 | 3.42% | 24.03 | 387.50 | 314.77 | 20% | 62.95 |
| TOTALS: | 1219.64 | | 72.83 | 542.40 | 677.24 | | 140.14 |
| 02040206030060 | | | | | | | |
| AG | 1667.69 | 2.69% | 44.89 | 838.88 | 828.81 | 15% | 124.32 |
| GC | 853.69 | 5.52% | 47.12 | 695.72 | 157.97 | 30% | 47.39 |
| OS | 210.35 | 1.29% | 2.72 | 168.66 | 41.69 | 0% | 0.00 |
| RR-1 | 50.86 | 12.64% | 6.43 | 9.59 | 41.27 | 20% | 8.25 |
| RR-2 | 39.53 | 1.51% | 0.60 | 9.60 | 29.93 | 20% | 5.99 |
| TOTALS: | 2822.12 | | 101.75 | 1722.45 | 1099.67 | | 185.95 |
| 02040206030070 | | | | | | | |
| AG | 940.23 | 13.09% | 123.03 | 379.10 | 561.13 | 15% | 84.17 |
| GC | 432.47 | 20.09% | 86.89 | 44.80 | 387.67 | 30% | 116.30 |
| IC | 277.61 | 18.88% | 52.41 | 50.70 | 226.91 | 40% | 90.76 |
| LI | 487.05 | 2.48% | 12.06 | 297.80 | 189.25 | 30% | 56.78 |
| LR | 257.14 | 23.22% | 59.72 | 56.00 | 201.14 | 30% | 60.34 |
| OS | 158.28 | 1.90% | 3.01 | 120.60 | 37.68 | 0% | 0.00 |
| RR-1 | 521.42 | 12.69% | 66.17 | 164.60 | 356.82 | 20% | 71.36 |
| RR-2 | 68.18 | 1.33% | 0.90 | 29.50 | 38.68 | 20% | 7.74 |
| TOTALS: | 3142.38 | | 404.19 | 1143.10 | 1999.28 | | 487.45 |
| 02040206030080 | | | | | | | |
| AG | 40.59 | 21.68% | 8.80 | 20.42 | 20.17 | 15% | 3.03 |
| GC | 167.84 | 38.90% | 65.29 | 136.78 | 31.06 | 30% | 9.32 |
| MHR | 17.25 | 58.44% | 10.08 | 5.10 | 12.15 | 25% | 3.04 |
| OS | 4.28 | 30.85% | 1.32 | 3.44 | 0.84 | 0% | 0.00 |
| RR-1 | 19.71 | 53.32% | 10.51 | 3.71 | 16.00 | 20% | 3.20 |
| TOTALS: | 249.68 | | 96.00 | 169.45 | 80.23 | | 18.58 |
| 02040206040030 | | | | | | | |
| GC | 3.90 | 28.18% | 1.10 | 0.50 | 3.40 | 30% | 1.02 |
| TOTALS: | 3.90 | | 1.10 | 0.50 | 3.40 | | 1.02 |

Table 3: Pollutant Loads by Land Cover

| LAND COVER | TOTAL PHOSPHORUS LOAD (LBS/ACRE/YEAR) | TOTAL NITROGEN LOAD (LBS/ACRE/YEAR) | TOTAL SUSPENDED SOLIDS LOAD (LBS/ACRE/YEAR) |
|----------------------------------|--|--|--|
| High, Medium Density Residential | 1.4 | 15 | 140 |
| Low Density, Rural Residential | 0.6 | 5 | 100 |
| Commercial | 2.1 | 22 | 200 |
| Industrial | 1.5 | 16 | 200 |
| Urban, Mixed Urban, Other Urban | 1 | 10 | 120 |
| Agricultural | 1.3 | 10 | 300 |
| Forest, Water, Wetlands | 0.1 | 3 | 40 |
| Barrenland/Transitional Area | 0.5 | 5 | 60 |

Table 4: Nonpoint Source Loads at Build-Out for Each HUC14

| HUC14 & ZONE | BUILD OUT ZONING | DEVELOPABLE AREA (ACRES) | TP (LBS/AC/YR) | TP (LBS/YR) | TN (LBS/AC/YR) | TN (LBS/YR) | TSS (LBS/AC/YR) | TSS (LBS/YR) |
|-----------------------|----------------------------|--------------------------|----------------|----------------|----------------|-----------------|-----------------|------------------|
| 0204020620010 | | | | | | | | |
| AG | Agricultural | 62.44 | 1.3 | 81.17 | 10 | 624.40 | 300 | 18732.03 |
| GC | Commercial | 174.53 | 2.1 | 366.52 | 22 | 3839.68 | 200 | 34906.21 |
| GCR | Commercial | 123.00 | 2.1 | 258.30 | 22 | 2706.01 | 200 | 24600.06 |
| GI-R | Industrial | 509.29 | 1.5 | 763.93 | 16 | 8148.62 | 200 | 101857.70 |
| HR | High Density Residential | 25.74 | 1.4 | 36.03 | 15 | 386.06 | 140 | 3603.24 |
| IC | Commercial | 60.62 | 2.1 | 127.29 | 22 | 1333.53 | 200 | 12123.01 |
| LC | Commercial | 170.87 | 2.1 | 358.83 | 22 | 3759.19 | 200 | 34174.49 |
| LI | Industrial | 98.04 | 1.5 | 147.06 | 16 | 1568.69 | 200 | 19608.63 |
| LI-R | Industrial | 92.64 | 1.5 | 138.96 | 16 | 1482.20 | 200 | 18527.52 |
| LR | Low Density Residential | 496.14 | 0.6 | 297.68 | 5 | 2480.71 | 100 | 49614.16 |
| MHR | Medium Density Residential | 397.73 | 1.4 | 556.83 | 15 | 5966.02 | 140 | 55682.82 |
| OS | Transitional Area | 31.28 | 0.5 | 15.64 | 5 | 156.40 | 60 | 1876.83 |
| RR-1 | Rural Residential | 125.64 | 0.6 | 75.38 | 5 | 628.21 | 100 | 12564.11 |
| RR-2 | Rural Residential | 83.95 | 0.6 | 50.37 | 5 | 419.77 | 100 | 8395.31 |
| TOTALS: | | 2451.92 | | 3274.01 | | 33499.48 | | 396266.13 |
| 02040206030050 | | | | | | | | |
| AG | Agricultural | 1.59 | 1.3 | 2.07 | 10 | 15.92 | 300 | 477.54 |
| GC | Commercial | 49.67 | 2.1 | 104.31 | 22 | 1092.75 | 200 | 9934.09 |
| OS | Transitional Area | 0.98 | 0.5 | 0.49 | 5 | 4.91 | 60 | 58.88 |
| RR-1 | Rural Residential | 310.22 | 0.6 | 186.13 | 5 | 1551.11 | 100 | 31022.15 |
| RR-2 | Rural Residential | 314.77 | 0.6 | 188.86 | 5 | 1573.87 | 100 | 31477.33 |
| TOTALS: | | 677.24 | | 481.86 | | 4238.55 | | 72970.00 |
| 02040206030060 | | | | | | | | |
| AG | Agricultural | 828.81 | 1.3 | 1077.45 | 10 | 8288.08 | 300 | 248642.30 |
| GC | Commercial | 157.97 | 2.1 | 331.74 | 22 | 3475.42 | 200 | 31594.72 |
| OS | Transitional Area | 41.69 | 0.5 | 20.85 | 5 | 208.47 | 60 | 2501.65 |
| RR-1 | Rural Residential | 41.27 | 0.6 | 24.76 | 5 | 206.36 | 100 | 4127.23 |
| RR-2 | Rural Residential | 29.93 | 0.6 | 17.96 | 5 | 149.63 | 100 | 2992.59 |
| TOTALS: | | 1099.67 | | 1472.76 | | 12327.96 | | 289858.49 |
| 02040206030070 | | | | | | | | |
| AG | Agricultural | 561.13 | 1.3 | 729.47 | 10 | 5611.28 | 300 | 168338.31 |
| GC | Commercial | 387.67 | 2.1 | 814.10 | 22 | 8528.70 | 200 | 77533.59 |
| IC | Commercial | 226.91 | 2.1 | 476.50 | 22 | 4991.92 | 200 | 45381.13 |
| LI | Industrial | 189.25 | 1.5 | 283.88 | 16 | 3028.07 | 200 | 37850.82 |
| LR | Low Density Residential | 201.14 | 0.6 | 120.69 | 5 | 1005.72 | 100 | 20114.38 |
| OS | Transitional Area | 37.68 | 0.5 | 18.84 | 5 | 188.39 | 60 | 2260.66 |
| RR-1 | Rural Residential | 356.82 | 0.6 | 214.09 | 5 | 1784.08 | 100 | 35681.63 |
| RR-2 | Rural Residential | 38.68 | 0.6 | 23.21 | 5 | 193.41 | 100 | 3868.23 |
| TOTALS: | | 1999.28 | | 2680.78 | | 25331.56 | | 391028.74 |
| 02040206030080 | | | | | | | | |
| AG | Agricultural | 20.17 | 1.3 | 26.22 | 10 | 201.71 | 300 | 6051.35 |
| GC | Commercial | 31.06 | 2.1 | 65.23 | 22 | 683.36 | 200 | 6212.34 |
| MHR | Medium Density Residential | 12.15 | 1.4 | 17.00 | 15 | 182.19 | 140 | 1700.41 |
| OS | Transitional Area | 0.84 | 0.5 | 0.42 | 5 | 4.22 | 60 | 50.69 |
| RR-1 | Rural Residential | 16.00 | 0.6 | 9.60 | 5 | 80.01 | 100 | 1600.19 |
| TOTALS: | | 80.23 | | 118.48 | | 1151.49 | | 15614.97 |
| 02040206040030 | | | | | | | | |
| GC | Commercial | 3.40 | 2.1 | 7.14 | 22 | 74.84 | 200 | 680.37 |
| TOTALS: | | 3.40 | | 7.14 | | 74.84 | | 680.37 |

MITIGATION PLAN

A Mitigation Plan element is required in the Township's Stormwater Management Plan (NJAC 7:8-4.2). A Mitigation Plan provides measures to protect waterways and aquifers and prevents adverse impacts from stormwater runoff. The design and performance standards outlined in this plan focus on three areas: maintaining groundwater recharge, minimizing potential flooding impacts and minimizing water quality impacts from proposed development. Some projects have unique site-specific conditions that prevent them from complying with the design and performance standards in this plan. In order for the Township to grant a waiver or exemption from the design and performance standards for groundwater recharge, stormwater runoff quality or quantity, the Stormwater Management Plan must include a mitigation progress documented in a Mitigation Plan.

The Mitigation Plan must identify the measures required to offset any potential impact created by granting the variance or exemption to the performances standards. Several strategies can be used to mitigate a development project and its impacts. Applicants can: identify, design and implement a compensating measure to mitigate impacts; complete a project identified by the Township as equivalent to the environmental impact created by the exemption or variance; or, provide funding for municipal projects that would address existing stormwater impacts.

All Mitigation Plans and review should consider the location of mitigation projects in relation to the property where the projected damage will occur. Mitigation should occur within the same drainage basin as that of the proposed development so that it provides benefits and protection similar to those that would have been achieved if the stormwater and recharge performance standards had been completely satisfied. Mitigation Plans should be prioritized towards the environmentally sensitive areas within the Township. The mitigation planning and approval process must also ensure that long term maintenance is achieved by clearly assigning responsibility for maintenance and by securing the funding and resources required to perform it. Mitigation should not be an option until it is clearly demonstrated that on-site compliance is not practical.

The Township is not required to grant a variance or exemption from the design and performance standards even though there is a mitigation plan. A mitigation plan simply provides options to meet the intent of the stormwater rules; The Township reserves the right to approve or deny any proposed mitigation measures, and any variances or exemptions in accordance with the Municipal Land Use Law.

Carneys Point Township Mitigation Plan:

If a proposed development requests a variance or exemption from strict compliance with the groundwater recharge, stormwater quantity, and stormwater quality requirements outlined in the Carneys Point Township Stormwater Management Plan and the Stormwater Control Ordinance, the applicant must provide mitigation in accordance with the following criteria. The project owner or developer will be solely responsible to identify and design a mitigation project including site selection, survey, engineering, construction, maintenance, and operation.

1. A Mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from the previously developed property that does not currently meet the design and performance standards outlined in the Stormwater Management Plan.
 - The applicant can select a project listed on the Municipal Stormwater Management Plan to compensate for the deficit from the performance standards resulting from the proposed project.
 - The applicant can obtain the necessary agreements to create a project to compensate for the deficit from the performance standards resulting from the proposed project.
2. The applicant must ensure the long-term maintenance of the project.
3. If a suitable mitigation site cannot be located in the same drainage area as the proposed development, the municipality may allow the applicant to provide funding to the municipality for an environmental enhancement project that has been identified in this Stormwater Management Plan. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including the costs associated with purchasing the property or easement for mitigation and the costs associated with the long-term maintenance requirements of the mitigation measure.

List of Township's Environmental Enhancement Projects

The listed projects may be applied as a mitigation measure to compensate for a deficit from the Township's design and performance standards. The project must be reviewed and discussed with the Township and the Township Engineer prior to acceptance.

GROUNDWATER RECHARGE

- Replacement of any impervious surface with permeable material or porous paving. This could include parking areas, sidewalks, walkways, bike paths.
- Retrofitting of any Township owned stormwater facility to provide additional recharge.
- Provide contribution to the revegetation and landscaping program.

WATER QUALITY

- Stream restoration project.
- Provide contribution to provide signs at parks – no wildlife feeding.
- Update or provide an Environmental Resources Inventory.
- Provide repairs at any stormwater outfall requiring repair or water quality measures.
- Provide contribution towards open space to preserve and protect the natural features and stormwater characteristics of the Township. This will also provide groundwater recharge and water quality.

WATER QUANTITY

- Install stormwater management measures to reduce peak flow into a stream or water body.
- Possibility of reduced flooding.
- Reduce peak discharges in stormwater flow.

REFERENCES

Cumberland – Salem County Soil Conservation District and NJDEP.

New Jersey Department of Environmental Protection, Ambient Biomonitoring Network; Benthic Macroinvertebrate Data, 2006-2007.

New Jersey Department of Environmental Protection, GIS Data.

New Jersey Department of Environmental Protection, Guidance Document for Tier A Municipalities – Feb. 2004.

NJDEP, New Jersey Stormwater Best Management Practices Manual – Feb. 2004 as amended through Feb. 2021

Salem County, New Jersey – GIS Data CD

Township of Carneys Point – Master Plan, 2000.

United States Department of Commerce, U.S. Census Bureau – 2000 US Census

United States Geological Survey (USGS) – Quadrangle Map.

APPENDIX “A”

STORMWATER CONTROL ORDINANCE

**976 TOWNSHIP OF CARNEYS POINT
SALEM COUNTY, NEW JERSEY**

ORDINANCE 976

**AMENDING THE TOWNSHIP CODE TO REVISE CHAPTER 180 ARTICLE I GOVERNING "STORMWATER
MANAGEMENT"**

WHEREAS, Carneys Point Township has received a letter from the New Jersey Department of Environmental Protection (NJDEP) dated March 2, 2020 regarding required amendments to the Township's Stormwater Control Ordinance (SCO).

WHEREAS, Carneys Point Township has reviewed the Stormwater Control Ordinance.

WHEREAS, the Township Committee desires to amend and update its existing Code provisions to comply with the requirements of the NJDEP and to serve the best interests of the Township and its residents by establishing minimum stormwater management requirements consistent with NJDEP standards and *N.J.A.C. 7:8 Stormwater Management*.

NOW, THEREFORE, BE IT ORDAINED, by the Township Committee of the Township of Carneys Point, County of Salem, State of New Jersey that the Township Code be and hereby is amended as follows:

Section 1. Chapter 180 Article I: "Stormwater Management". Ordinance shall be amended as follows:

Chapter 180 Stormwater Management

Shall be revised to be:

§ 180-1. Scope and Purpose:

A. Policy Statement

Flood control, groundwater recharge, and pollutant reduction shall be achieved through the use of stormwater management measures, including green infrastructure Best Management Practices (GI BMPs) and nonstructural stormwater management strategies. GI BMPs and low impact development (LID) should be utilized to meet the goal of maintaining natural hydrology to reduce stormwater runoff volume, reduce erosion, encourage infiltration and groundwater recharge, and reduce pollution. GI BMPs and LID should be developed based upon physical site conditions and the origin, nature and the anticipated quantity, or amount, of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge.

B. Purpose

The purpose of this ordinance is to establish minimum stormwater management requirements and controls for "major development," as defined below in § 180-2.

C. Applicability

1. This ordinance shall be applicable to the following major developments:

- a. Non-residential major developments; and
 - b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.
2. This ordinance shall also be applicable to all major developments undertaken by Carneys Point.

D. Compatibility with Other Permit and Ordinance Requirements

Development approvals issued pursuant to this ordinance are to be considered an integral part of development approvals and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. In their interpretation and application, the provisions of this ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare.

This ordinance is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

§ 180-2. Definitions:

For the purpose of this ordinance, the following terms, phrases, words and their derivations shall have the meanings stated herein unless their use in the text of this Chapter clearly demonstrates a different meaning. When not inconsistent with the context, words used in the present tense include the future, words used in the plural number include the singular number, and words used in the singular number include the plural number. The word "shall" is always mandatory and not merely directory. The definitions below are the same as or based on the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2.

"CAFRA Centers, Cores or Nodes" means those areas with boundaries incorporated by reference or revised by the Department in accordance with N.J.A.C. 7:7-13.16.

"CAFRA Planning Map" means the map used by the Department to identify the location of Coastal Planning Areas, CAFRA centers, CAFRA cores, and CAFRA nodes. The CAFRA Planning Map is available on the Department's Geographic Information System (GIS).

"Community basin" means an infiltration system, sand filter designed to infiltrate, standard constructed wetland, or wet pond, established in accordance with N.J.A.C. 7:8-4.2(c)14, that is designed and constructed in accordance with the New Jersey Stormwater Best Management Practices Manual, or an alternate design, approved in accordance with N.J.A.C. 7:8-5.2(g), for an infiltration system, sand filter designed to infiltrate, standard constructed wetland, or wet pond and that complies with the requirements of this chapter.

“Compaction” means the increase in soil bulk density.

“Contributory drainage area” means the area from which stormwater runoff drains to a stormwater management measure, not including the area of the stormwater management measure itself.

“Core” means a pedestrian-oriented area of commercial and civic uses serving the surrounding municipality, generally including housing and access to public transportation.

“County review agency” means an agency designated by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

1. A county planning agency or
2. A county water resource association created under N.J.S.A 58:16A-55.5, if the ordinance or resolution delegates authority to approve, conditionally approve, or disapprove municipal stormwater management plans and implementing ordinances.

“Department” means the Department of Environmental Protection.

“Designated Center” means a State Development and Redevelopment Plan Center as designated by the State Planning Commission such as urban, regional, town, village, or hamlet.

“Design engineer” means a person professionally qualified and duly licensed in New Jersey to perform engineering services that may include, but not necessarily be limited to, development of project requirements, creation and development of project design and preparation of drawings and specifications.

“Development” means the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlarge-enlargement of any building or structure, any mining excavation or landfill, and any use or change in the use of any building or other structure, or land or extension of use of land, for which permission is required under the Municipal Land Use Law, N.J.S.A. 40:55D-1 *et seq.*

In the case of development of agricultural land, development means: any activity that requires a State permit, any activity reviewed by the County Agricultural Board (CAB) and the State Agricultural Development Committee (SADC), and municipal review of any activity not exempted by the Right to Farm Act, N.J.S.A 4:1C-1 *et seq.*

“Disturbance” means the placement or reconstruction of impervious surface or motor vehicle surface, or exposure and/or movement of soil or bedrock or clearing, cutting, or

removing of vegetation. Milling and repaving is not considered disturbance for the purposes of this definition.

“Drainage area” means a geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.

“Environmentally constrained area” means the following areas where the physical alteration of the land is in some way restricted, either through regulation, easement, deed restriction or ownership such as: wetlands, floodplains, threatened and endangered species sites or designated habitats, and parks and preserves. Habitats of endangered or threatened species are identified using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program.

“Environmentally critical area” means an area or feature which is of significant environmental value, including but not limited to: stream corridors, natural heritage priority sites, habitats of endangered or threatened species, large areas of contiguous open space or upland forest, steep slopes, and well head protection and groundwater recharge areas. Habitats of endangered or threatened species are identified using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program.

“Empowerment Neighborhoods” means neighborhoods designated by the Urban Coordinating Council “in consultation and conjunction with” the New Jersey Redevelopment Authority pursuant to N.J.S.A 55:19-69.

“Erosion” means the detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

“Green infrastructure” means a stormwater management measure that manages stormwater close to its source by:

1. Treating stormwater runoff through infiltration into subsoil;
2. Treating stormwater runoff through filtration by vegetation or soil; or
3. Storing stormwater runoff for reuse.

“HUC 14” or “hydrologic unit code 14” means an area within which water drains to a particular receiving surface water body, also known as a subwatershed, which is identified by a 14-digit hydrologic unit boundary designation, delineated within New Jersey by the United States Geological Survey.

“Impervious surface” means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

“Infiltration” is the process by which water seeps into the soil from precipitation.

“Lead planning agency” means one or more public entities having stormwater management planning authority designated by the regional stormwater management planning committee pursuant to N.J.A.C. 7:8-3.2, that serves as the primary representative of the committee.

“Major development” means an individual “development,” as well as multiple developments that individually or collectively result in:

1. The disturbance of one or more acres of land since February 2, 2004;
2. The creation of one-quarter acre or more of “regulated impervious surface” since February 2, 2004;
3. The creation of one-quarter acre or more of “regulated motor vehicle surface” since March 2, 2021 or the effective date of this ordinance, whichever is earlier; or
4. A combination of 2 and 3 above that totals an area of one-quarter acre or more. The same surface shall not be counted twice when determining if the combination area equals one-quarter acre or more.

Major development includes all developments that are part of a common plan of development or sale (for example, phased residential development) that collectively or individually meet any one or more of paragraphs 1, 2, 3, or 4 above. Projects undertaken by any government agency that otherwise meet the definition of “major development” but which do not require approval under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., are also considered “major development.”

“Motor vehicle” means land vehicles propelled other than by muscular power, such as automobiles, motorcycles, autocycles, and low speed vehicles. For the purposes of this definition, motor vehicle does not include farm equipment, snowmobiles, all-terrain vehicles, motorized wheelchairs, go-carts, gas buggies, golf carts, ski-slope grooming machines, or vehicles that run only on rails or tracks.

“Motor vehicle surface” means any pervious or impervious surface that is intended to be used by “motor vehicles” and/or aircraft, and is directly exposed to precipitation including, but not limited to, driveways, parking areas, parking garages, roads, racetracks, and runways.

“Municipality” means any city, borough, town, township, or village.

“New Jersey Stormwater Best Management Practices (BMP) Manual” or **“BMP Manual”** means the manual maintained by the Department providing, in part, design specifications, removal rates, calculation methods, and soil testing procedures approved by the Department as being capable of contributing to the achievement of the stormwater management standards specified in this chapter. The BMP Manual is periodically amended by the Department as necessary to provide design specifications on additional best management practices and new information on already included practices reflecting the best available current information regarding the particular

practice and the Department's determination as to the ability of that best management practice to contribute to compliance with the standards contained in this chapter. Alternative stormwater management measures, removal rates, or calculation methods may be utilized, subject to any limitations specified in this chapter, provided the design engineer demonstrates to the municipality, in accordance with Chapter 180-4F. of this ordinance and N.J.A.C. 7:8-5.2(g), that the proposed measure and its design will contribute to achievement of the design and performance standards established by this chapter.

"Node" means an area designated by the State Planning Commission concentrating facilities and activities which are not organized in a compact form.

"Nutrient" means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

"Person" means any individual, corporation, company, partnership, firm, association, political subdivision of this State and any state, interstate or Federal agency.

"Pollutant" means any dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, medical wastes, radioactive substance (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. §§ 2011 *et seq.*)), thermal waste, wrecked or discarded equipment, rock, sand, cellar dirt, industrial, municipal, agricultural, and construction waste or runoff, or other residue discharged directly or indirectly to the land, ground waters or surface waters of the State, or to a domestic treatment works. "Pollutant" includes both hazardous and nonhazardous pollutants.

"Recharge" means the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

"Regulated impervious surface" means any of the following, alone or in combination:

1. A net increase of impervious surface;
2. The total area of impervious surface collected by a new stormwater conveyance system (for the purpose of this definition, a "new stormwater conveyance system" is a stormwater conveyance system that is constructed where one did not exist immediately prior to its construction or an existing system for which a new discharge location is created);
3. The total area of impervious surface proposed to be newly collected by an existing stormwater conveyance system; and/or
4. The total area of impervious surface collected by an existing stormwater conveyance system where the capacity of that conveyance system is increased.

"Regulated motor vehicle surface" means any of the following, alone or in combination:

1. The total area of motor vehicle surface that is currently receiving water;

2. A net increase in motor vehicle surface; and/or quality treatment either by vegetation or soil, by an existing stormwater management measure, or by treatment at a wastewater treatment plant, where the water quality treatment will be modified or removed.

“Sediment” means solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

“Site” means the lot or lots upon which a major development is to occur or has occurred.

“Soil” means all unconsolidated mineral and organic material of any origin.

“State Development and Redevelopment Plan Metropolitan Planning Area (PA1)” means an area delineated on the State Plan Policy Map and adopted by the State Planning Commission that is intended to be the focus for much of the State’s future redevelopment and revitalization efforts.

“State Plan Policy Map” is defined as the geographic application of the State Development and Redevelopment Plan’s goals and statewide policies, and the official map of these goals and policies.

“Stormwater” means water resulting from precipitation (including rain and snow) that runs off the land’s surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities, or conveyed by snow removal equipment.

“Stormwater management BMP” means an excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management BMP may either be normally dry (that is, a detention basin or infiltration system), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (most constructed stormwater wetlands).

“Stormwater management measure” means any practice, technology, process, program, or other method intended to control or reduce stormwater runoff and associated pollutants, or to induce or control the infiltration or groundwater recharge of stormwater or to eliminate illicit or illegal non-stormwater discharges into stormwater conveyances.

“Stormwater runoff” means water flow on the surface of the ground or in storm sewers, resulting from precipitation.

“Stormwater management planning agency” means a public body authorized by legislation to prepare stormwater management plans.

“Stormwater management planning area” means the geographic area for which a stormwater management planning agency is authorized to prepare stormwater management plans, or a specific portion of that area identified in a stormwater management plan prepared by that agency.

“Tidal Flood Hazard Area” means a flood hazard area in which the flood elevation resulting from the two-, 10-, or 100-year storm, as applicable, is governed by tidal flooding from the Atlantic Ocean. Flooding in a tidal flood hazard area may be contributed to, or influenced by, stormwater runoff from inland areas, but the depth of flooding generated by the tidal rise and fall of the Atlantic Ocean is greater than flooding from any fluvial sources. In some situations, depending upon the extent of the storm surge from a particular storm event, a flood hazard area may be tidal in the 100-year storm, but fluvial in more frequent storm events.

“Urban Coordinating Council Empowerment Neighborhood” means a neighborhood given priority access to State resources through the New Jersey Redevelopment Authority.

“Urban Enterprise Zones” means a zone designated by the New Jersey Enterprise Zone Authority pursuant to the New Jersey Urban Enterprise Zones Act, N.J.S.A. 52:27H-60 et. seq.

“Urban Redevelopment Area” is defined as previously developed portions of areas:

1. Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
2. Designated as CAFRA Centers, Cores or Nodes;
3. Designated as Urban Enterprise Zones; and
4. Designated as Urban Coordinating Council Empowerment Neighborhoods.

“Water control structure” means a structure within, or adjacent to, a water, which intentionally or coincidentally alters the hydraulic capacity, the flood elevation resulting from the two-, 10-, or 100-year storm, flood hazard area limit, and/or floodway limit of the water. Examples of a water control structure may include a bridge, culvert, dam, embankment, ford (if above grade), retaining wall, and weir.

“Waters of the State” means the ocean and its estuaries, all springs, streams, wetlands, and bodies of surface or groundwater, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

“Wetlands” or “wetland” means an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

§ 180-3. Design and Performance Standards for Stormwater Management Measures

- A. Stormwater management measures for major development shall be designed to provide erosion control, groundwater recharge, stormwater runoff quantity control, and stormwater runoff quality treatment as follows:
 - 1. The minimum standards for erosion control are those established under the Soil and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules at N.J.A.C. 2:90.
 - 2. The minimum standards for groundwater recharge, stormwater quality, and stormwater runoff quantity shall be met by incorporating green infrastructure.
- B. The standards in this ordinance apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or Water Quality Management Plan adopted in accordance with Department rules.

§ 180-4. Stormwater Management Requirements for Major Development

- A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with § 180-10.
- B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department's Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 15.150, particularly *Helonias bullata* (swamp pink) and/or *Clemmys muhlenbergi* (bog turtle).
- C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of § 180-4P, Q and R:
 - 1. The construction of an underground utility line provided that the disturbed areas are revegetated upon completion;
 - 2. The construction of an aboveground utility line provided that the existing conditions are maintained to the maximum extent practicable; and
 - 3. The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.
- D. A waiver from strict compliance from the green infrastructure, groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of § 180-4O, P, Q and R may be obtained for the enlargement of an existing public roadway or