



REMINGTON
& VERNICK
ENGINEERS

RVE HQ:
2059 Springdale Road
Cherry Hill, NJ 08003
O: (856) 795-9595
F: (856) 795-1882

**Watershed Inventory Report
Phase 1 of the Watershed Improvement Plan
For the
Township of Florence
Burlington County, New Jersey**

Permit Number: NJG0149551

Stormwater Program Coordinator: Ted Lovenduski

Approved: Pending

RVE Project No. Job 0315T020

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Acknowledgements

The Township of Florence (Burlington County) Watershed Inventory Report has been prepared by Remington & Vernick Engineers.

Funding for this project was provided by the Township of Florence.

Introduction

The Township of Florence (also referred to in this report as “The Township”) is located in Burlington County, New Jersey. Located in Central New Jersey, the Township borders the Delaware River to the north, which leads to the Delaware Bay. Other municipalities that border Florence include Springfield, Mansfield and Burlington Township. Florence Township covers approximately 9.65 square miles. Its population is 12,812 people according to the 2020 US Census. The land use within Florence can be found in Table 1 below.

Table 1: Land Use Types within Florence Township

Land Use Type	Acres	Percentage
AGRICULTURE	1129.25	17%
BARREN LAND	438.96	7%
FOREST	832.91	13%
URBAN	2826.54	43%
WATER	339.96	5%
WETLANDS	976.30	15%

Florence Township contains four sub watersheds: Assiscunk Creek (Neck Rd to Jacksonville Rd), Crafts Creek (below Rt 206), LDRV tribs (Bustleton Creek area), and LDRV tribs (Crystal Creek area). All sub watersheds are part of the Assiscunk, Crosswicks, and Doctors Watershed Management Area, according to NJDEP (See Figure 1).

There are areas within the township that may be prone to flooding. The FEMA National Flood Layer Viewer was used to identify roads that fall in the 500 and 100 year floodplains. Those roads are in Appendix A.

The Goal of the Watershed Improvement Plan (WIP) is to provide a comprehensive procedure for how the Township of Florence will comply with the new MS4 regulations put in place by the NJDEP. The WIP is required to identify opportunities to improve water quality, reduce contribution of pollutants to water bodies with impairments and TMDLs, and to address stormwater flooding to protect human health, safety, and the environment. Phase 1 is to complete stormwater inventory by mapping required features, data, and to complete a Watershed Inventory Report. Phase 2 will evaluate the information found in Phase 1 to determine what potential improvement projects may be implemented to address water quality and quantity concerns. In Phase 3, permittees will identify which of the potential improvement projects they are choosing to implement and identify schedules. There are areas within the Township may be prone to flooding. The FEMA National Flood Layer Viewer was used to identify roads that fall in the 500 and 100 year floodplains. Those roads are in Appendix A.

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Electronic Data to be Uploaded to NJDEP Online

- Drainage Areas for Outfalls
 - o Topographical Map
 - o Shape File
- Stormwater Interconnections
 - o Shape File
- Drainage Area for Each Interconnections
 - o Topographical Map
 - o Shape File
- Non-Municipally Owned Stormwater Infrastructure
 - o Shape File

Acronyms & Definitions

1. Acronyms

- i. “BMP” – Best Management Practice
- ii. “DO” – Dissolved Oxygen
- iii. “EPA” – U.S. Environmental Protection Agency
- iv. “GIS” – Geographic Information System
- v. “HUC 14” – Hydrologic Unit Code 14
- vi. “MS4” – Municipal Separate Storm Sewer System
- vii. “MTD” – Manufactured Treatment Device
- viii. “NJPDES” – New Jersey Pollutant Discharge Elimination System
- ix. “NJ-WET” – New Jersey Watershed Evaluation Tool
- x. “TDS” – Total Dissolved Solids

- xi. *“TMDL” – Total Maximum Daily Load*
- xii. *“TSS” – Total Suspended Solids*
- xiii. *“WIP” – Watershed Improvement Plan*
- xiv. *“DEM” – Digital Elevation Model*

2. Definitions

- i. *“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 sub watershed, which is identified by a 14-digit hydrologic unit boundary designation, delineated within New Jersey by the United States Geological Survey. (N.J.A.C. 7:9B)*
- ii. *“Municipal separate storm sewer” (or MS4 conveyance) means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) as defined in more detail at N.J.A.C. 7:14A-1.2.*
- iii. *“Outfall” means any point source which discharges directly to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.*
- iv. *“Storm drain inlet” means the point of entry into the storm sewer system.*
- v. *“Stormwater” means water resulting from precipitation (including rain and snow) that runs off the land's surface, is transmitted to the subsurface, is captured by separate storm sewers or other sewage or drainage facilities or is conveyed by snow removal equipment.*
- vi. *“Stormwater facility” means stormwater infrastructure including, but not limited to, catch basins, infiltration basins, detention basins, green infrastructure (GI), filter strips, riparian buffers, infiltration trenches, sand filters, constructed wetlands, wet basins, bioretention systems, low flow bypasses, Manufactured Treatment Devices (MTDs), and stormwater conveyances.*
- vii. *“Stormwater management basin” means a stormwater management basin as defined in N.J.A.C. 7:8.*
- viii. *“Stormwater management measure” means a stormwater management measure as defined in N.J.A.C. 7:8.3*
- ix. *“Stormwater runoff” means water flow on the surface of the ground or in storm sewers, resulting from precipitation.*
- x. *“Total maximum daily load” or “TMDL” means a total maximum daily load formally established pursuant to Section 7 of the Water Quality Planning Act (N.J.S.A. 58:11A-7) and Section 303(d) of the Clean Water Act, 33 U.S.C. §§12512 et seq. A TMDL is the sum of individual waste load allocations for point sources, load allocations for nonpoint sources of pollution, other sources such as tributaries or adjacent segments, and allocations to a reserve or margin of safety for an individual pollutant.*

- xi. *“Waters of the State” means the Burlington and its estuaries, all springs, streams and bodies of surface or ground water, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction” (see N.J.A.C. 7:9B-1.4).*

Public Participation

The Township plans on having several meetings with the Stakeholders. Stakeholders are listed below. Engaging with stakeholders opens a channel of communication and collaboration.

- **List of stakeholders**

- Kristan I. Marter, Mayor
- Council Members
- Thomas A Sahol, Township Administrator
- Ted Lovenduski, Storm Water Coordinator
- David Wright , Superintendent of Public Works
- New Jersey Department of Transportation
- Burlington County
- Delaware River Basin Commission
- Remington & Vernick Engineers

- **Future Scheduled Meetings**

- Public Meetings for the Watershed Improvement Plan will be scheduled during the Public Council Meetings. Public Council Meeting are the 1st , 2nd and 3rd Wednesdays of every month.

First Meeting will be scheduled in April 2026 where the WIP will be introduced and open for public comment.

Second meeting will be scheduled for June of 2026.

Meeting minutes and notes and a summary of feedback from stakeholders will be written up at each meeting and reported in WIP phase 2.

- The Watershed Improvement Plan Phase 1 will be put on the dedicated stormwater webpage at: [Public Works - Township of Florence](#)

Stormwater Outfall(s)

The information utilized in this section was gathered using the Municipal Stormwater Infrastructure data provided by the township and Colliers Engineers as part of the Outfall and MS4 Infrastructure Mapping Projects from 2020 and 2025. This data was processed using QGIS software by Remington and Vernick Engineers. Water Quality Classification Data was gathered from the NJDEP Open Data Portal. The data was accessed December 2025. The findings are summarized below in Table 2 and Figure 2.

Stormwater Outfalls Owned/Operated by Permittee

- There are 44 outfalls owned and operated by the Township of Florence.

Receiving Surface Waters

- 16% of outfalls listed below discharge into the Assiscunk Creek Tributary
- 18% of outfalls listed below discharge into the Bustleton Creek and Bustleton Creek Tributary
- 41% of outfalls listed below discharge into the Crafts Creek and Crafts Creek tributary
- 20% of outfalls listed below discharge into the Delaware River
- 4.5% of outfalls listed below discharge into wetland areas

Water Quality Classifications

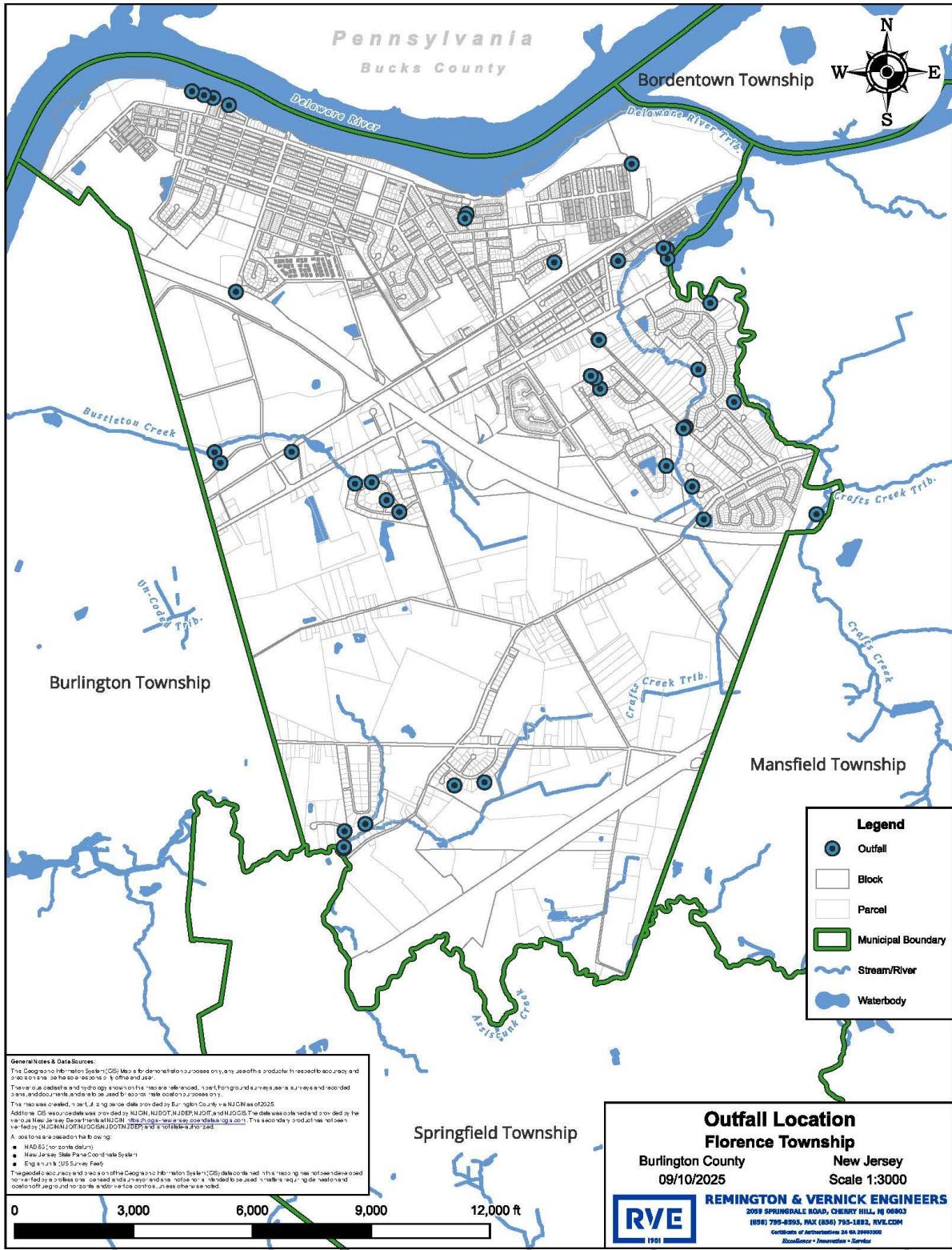
- The portion of the Delaware River that Township owned and operated outfalls discharge into is classified as FW2-NT
- The portion of the Crafts Creek that Township owned and operated outfalls discharge into is classified as FW2-NT
- The portion of the Crafts Creek Tributary that Township owned and operated outfalls discharge into is classified as FW2-NT
- The portion of the Bustleton Creek that Township owned and operated outfalls discharge into is classified as FW2-NT
- The portion of the Assiscunk Creek that Township owned and operated outfalls discharge into is classified as FW2-NT

Table 2: Receiving Surface Water Bodies & Water Quality Classifications

Local Outfall ID	Receiving Surface Water Body	Water Quality Classification
OF-15	Assiscunk Creek Tributary	FW2-NT
OF-12	Assiscunk Creek Tributary	FW2-NT
OF-13	Assiscunk Creek Tributary	FW2-NT
OF-14	Assiscunk Creek Tributary	FW2-NT
OF-16	Assiscunk Creek Tributary	FW2-NT
OF-18	Assiscunk Creek Tributary	FW2-NT
OF-17	Assiscunk Creek Tributary	FW2-NT
OF-20	Bustleton Creek	FW2-NT
OF-19	Bustleton Creek	FW2-NT
OF-21	Bustleton Creek	FW2-NT
OF-22	Bustleton Creek	FW2-NT
OF-23	Bustleton Creek	FW2-NT
OF-49	Bustleton Creek	FW2-NT
OF-50	Bustleton Creek	FW2-NT
OF-24	Bustleton Creek Tributary	FW2-NT
OF-09	Crafts Creek	FW2-NT
OF-32	Crafts Creek	FW2-NT
OF-33	Crafts Creek	FW2-NT
OF-47	Crafts Creek	FW2-NT
OF-08	Crafts Creek Tributary	FW2-NT
OF-10	Crafts Creek Tributary	FW2-NT
OF-11	Crafts Creek Tributary	FW2-NT
OF-07	Crafts Creek Tributary	FW2-NT
OF-34	Crafts Creek Tributary	FW2-NT
OF-35	Crafts Creek Tributary	FW2-NT
OF-40	Crafts Creek Tributary	FW2-NT
OF-41	Crafts Creek Tributary	FW2-NT
OF-42	Crafts Creek Tributary	FW2-NT
OF-44	Crafts Creek Tributary	FW2-NT
OF-45	Crafts Creek Tributary	FW2-NT
OF-46	Crafts Creek Tributary	FW2-NT
CD202402	Crafts Creek Tributary	FW2-NT
CD202401	Crafts Creek Tributary	FW2-NT
OF-02	Delaware River	FW2-NT
OF-01	Delaware River	FW2-NT
OF-05	Delaware River	FW2-NT
OF-06	Delaware River	FW2-NT
OF-39	Delaware River	FW2-NT

Local Outfall ID	Receiving Surface Water Body	Water Quality Classification
OF-38	Delaware River	FW2-NT
OF-37	Delaware River	FW2-NT
OF-43	Delaware River	FW2-NT
OF-48	Delaware River	FW2-NT
OF-51	Wetlands	N/A
OF-52	Wetlands	N/A

Figure 2: Township of Florence Stormwater Outfalls



Stormwater Interconnection(s)

The information utilized in this section was gathered using Municipal Stormwater Infrastructure data provided by the township and Collier’s Engineers as part of the Outfall and MS4 Infrastructure Mapping Projects from 2020 and 2025. This data was processed using QGIS software by Remington and Vernick Engineers. The findings are summarized below in Table 3 and Figure 3.

Interconnections from the permittee’s MS4 into another entity

- There are **34** interconnections from the Township of Florence’s MS4 infrastructure into other entities MS4 systems. These systems are owned and operated by either Burlington County.
 - Each of these interconnections are directed piped connection.

Interconnection(s) into the permittee’s MS4 from another entity (for Tier A permittees only)

- There are **19** interconnections owned and operated by Burlington County that convey stormwater flow to interconnections owned and operated by Florence Township
 - Each of these interconnections are directed piped connection.
- There are **2** interconnections owned and operated by the NJDOT that convey stormwater flow to interconnections owned and operated by Florence Township.
 - Each of these interconnections are directed piped connection

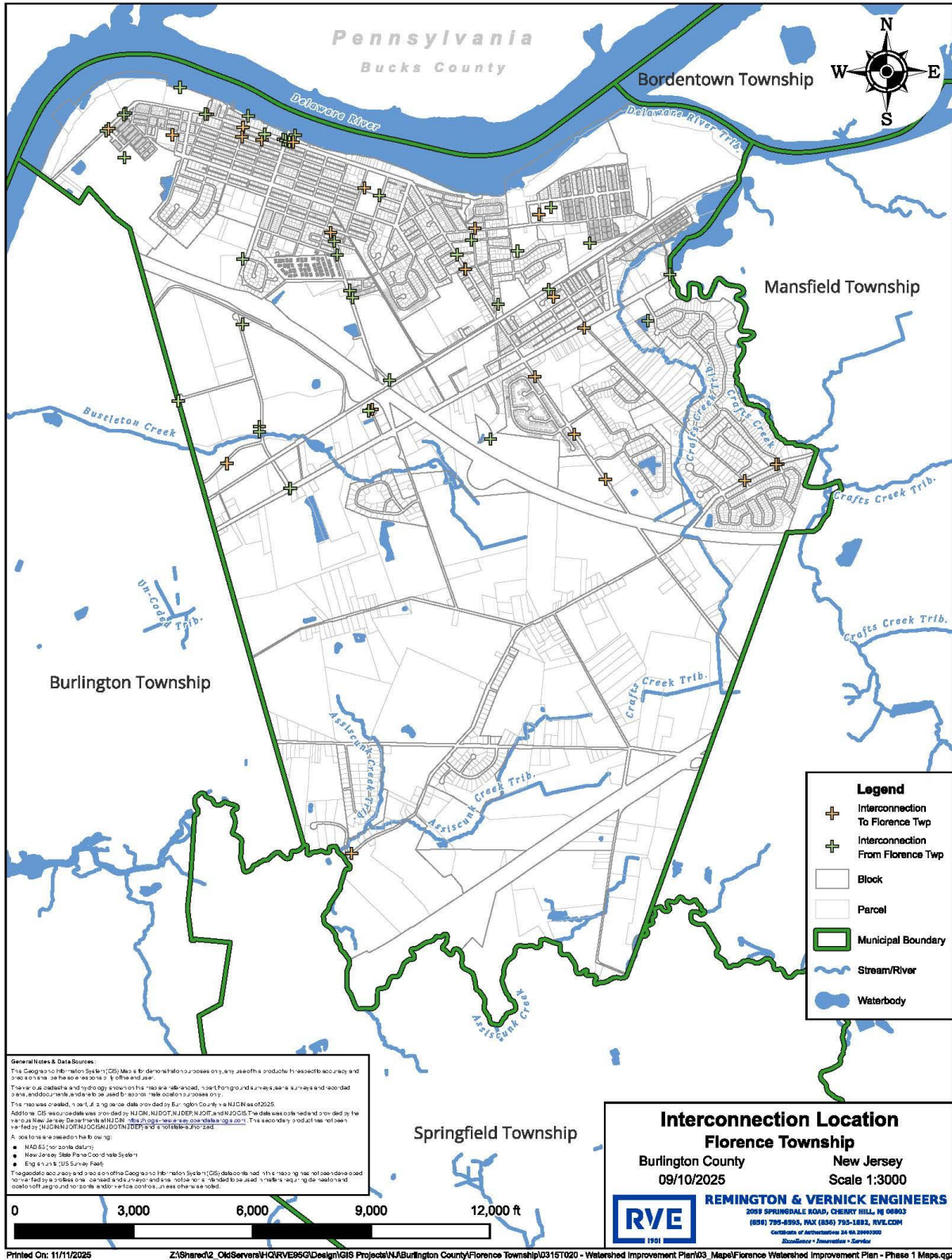
Table 3: Stormwater Interconnections from and Into the Township of Florence

Interconnect ID	Type	Upstream Entity	Downstream Entity
IC-01	Pipe	Florence Township	Burlington County
IC-02	Pipe	Florence Township	Burlington County
IC-03	Pipe	Florence Township	Burlington County
IC-04	Pipe	Florence Township	Burlington County
IC-05	Pipe	Burlington County	Florence Township
IC-06	Pipe	Florence Township	Burlington County
IC-07	Pipe	Burlington County	Florence Township
IC-08	Pipe	Private	Florence Township
IC-09	Pipe	Private	Florence Township
IC-10	Pipe	Florence Township	Burlington County
IC-11	Pipe	Florence Township	Burlington County
IC-12	Pipe	Florence Township	Burlington County
IC-13	Pipe	Florence Township	Burlington County
IC-14	Pipe	Florence Township	Burlington County
IC-15	Pipe	Burlington County	Florence Township
IC-16	Pipe	Florence Township	Private

Interconnect ID	Type	Upstream Entity	Downstream Entity
IC-17	Pipe	Private	Florence Township
IC-18	Pipe	Florence Township	Private
IC-19	Pipe	Private	Florence Township
IC-20	Pipe	Florence Township	Private
IC-21	Pipe	Florence Township	Private
IC-22	Pipe	Florence Township	Private
IC-23	Pipe	Private	Florence Township
IC-24	Pipe	Private	Florence Township
IC-25	Pipe	NJDOT	Florence Township
IC-26	Pipe	Florence Township	Private
IC-27	Pipe	Florence Township	Private
IC-28	Pipe	Private	Florence Township
IC-29	Pipe	Florence Township	Private
IC-30	Pipe	Burlington County	Florence Township
IC-31	Pipe	Burlington County	Florence Township
IC-32	Pipe	Burlington County	Florence Township
IC-33	Pipe	Burlington County	Florence Township
IC-34	Pipe	Burlington County	Florence Township
IC-35	Pipe	Burlington County	Florence Township
IC-36	Pipe	Florence Township	NJDOT
IC-37	Pipe	Florence Township	NJDOT
IC-38	Pipe	Florence Township	NJDOT
IC-39	Pipe	Private	Florence Township
IC-40	Pipe	Florence Township	Private
IC-41	Pipe	Florence Township	Private
IC-42	Pipe	Florence Township	Burlington Township
IC-43	Pipe	Florence Township	Private
IC-44	Pipe	Florence Township	NJDOT
IC-45	Pipe	Florence Township	Burlington County
IC-46	Pipe	Florence Township	Burlington County
IC-47	Pipe	Florence Township	Burlington County
IC-48	Pipe	Burlington County	Florence Township
IC-49	Pipe	Florence Township	Burlington County
IC-50	Pipe	Florence Township	Burlington County
IC-51	Pipe	Florence Township	Burlington County
IC-52	Pipe	Burlington County	Florence Township
IC-53	Pipe	Florence Township	Private
IC-54	Pipe	Private	Florence Township
IC-55	Pipe	Florence Township	Private
IC-56	Pipe	Burlington County	Florence Township

Interconnect ID	Type	Upstream Entity	Downstream Entity
IC-57	Pipe	Florence Township	Burlington County
IC-58	Pipe	Burlington County	Florence Township
IC-59	Pipe	Florence Township	Burlington County
IC-60	Pipe	Private	Florence Township
IC-61	Pipe	Florence Township	Private

Figure 3: Interconnections into and from the Permittee's MS4



Drainage Area(s) for Stormwater Outfalls and Stormwater Interconnections

The information utilized in this section was gathered using data from the 2019 New Jersey LiDAR flyover and Municipal Stormwater Infrastructure data provided by the Township and Colliers Engineers as part of the Outfall and MS4 Infrastructure Mapping Projects from 2020 and 2025. This data was processed using QGIS, SAGA, PCRaster, and GDAL software by Remington and Vernick Engineers. The findings are summarized below and in Table 4 and Figure 4 and Figure 5. Drainage area calculation methods are also described below.

Storm Drain Inlets

- The Township of Florence owns and operates 1164 storm drain inlets and catch basins.

MS4 Outfall Drainage Areas

- Utilizing QGIS, SAGA, PCRaster, and GDAL, the DEM from the LiDAR flyover was clipped to the Township's Boundary with a 500-foot buffer.
- The clipped DEM was pre-processed to make it hydraulically correct with a max fill depth of 1 foot.
- Flow directions were determined from the pre-processed DEM.
- Outfall drainage areas were determined by calculating and vectorizing the upslope areas of each outfalls' upstream stormwater network.

Drainage area of interconnection(s) from the permittee to another entity

- Utilizing QGIS, SAGA, PCRaster, and GDAL, the DEM from the LiDAR flyover was clipped to the Township's Boundary with a 500-foot buffer.
- The clipped DEM was pre-processed to make it hydraulically correct with a max fill depth of 1 foot.
- Flow directions were determined from the pre-processed DEM.
- The interconnection pipe network was categorized by receiving interconnections
- The Interconnection drainage areas were determined by calculating and vectorizing the upslope areas of each interconnect's upstream stormwater network.

Table 4: Drainage Areas for Outfalls and Outward Interconnections

Drainage Area ID	Drainage Area (acres)	Outfall	Primary Contributing Drainage Area Type
CD202401	0.341950739	MS4 Outfall CD202401	Residential
CD202402	12.35349577	MS4 Outfall CD202402	Residential
OF-01	0.013104482	MS4 Outfall OF-01	Residential
OF-02	198.9862368	MS4 Outfall OF-02	Residential
OF-05	77.20267298	MS4 Outfall OF-05	Residential
OF-06	69.79941656	MS4 Outfall OF-06	Residential
OF-07	22.50968251	MS4 Outfall OF-07	Residential
OF-08	0.764011314	MS4 Outfall OF-08	Residential
OF-09	13.91363895	MS4 Outfall OF-09	Residential
OF-10	30.10125497	MS4 Outfall OF-10	Residential
OF-11	13.89854775	MS4 Outfall OF-11	Residential
OF-12	21.50733758	MS4 Outfall OF-12	Residential
OF-13	11.04629533	MS4 Outfall OF-13	Residential
OF-14	4.839987655	MS4 Outfall OF-14	Residential
OF-15	29.54337563	MS4 Outfall OF-15	Residential
OF-16	0.437144965	MS4 Outfall OF-16	Residential
OF-17	0.156511725	MS4 Outfall OF-17	Park/Open Space
OF-18	0.933877865	MS4 Outfall OF-18	Residential
OF-19	7.256896374	MS4 Outfall OF-19	Residential
OF-20	3.154462469	MS4 Outfall OF-20	Residential
OF-21	2.0319314	MS4 Outfall OF-21	Residential
OF-22	3.90339493	MS4 Outfall OF-22	Residential
OF-23	6.674123123	MS4 Outfall OF-23	Residential
OF-24	0.545195392	MS4 Outfall OF-24	Commercial
OF-32	16.3137528	MS4 Outfall OF-32	Residential
OF-33	3.908819148	MS4 Outfall OF-33	Residential
OF-34	36.99983645	MS4 Outfall OF-34	Residential
OF-35	0.96428514	MS4 Outfall OF-35	Residential
OF-37	0.018296835	MS4 Outfall OF-37	Park/Open Space
OF-38	1.229596575	MS4 Outfall OF-38	Park/Open Space
OF-39	0.974182589	MS4 Outfall OF-39	Residential
OF-40	0.057362611	MS4 Outfall OF-40	Residential
OF-41	12.61532966	MS4 Outfall OF-41	Residential
OF-42	0.010384611	MS4 Outfall OF-42	Park/Open Space
OF-43	1.93822649	MS4 Outfall OF-43	Residential
OF-44	30.17418062	MS4 Outfall OF-44	Residential
OF-45	17.21693137	MS4 Outfall OF-45	Residential
OF-46	38.15975352	MS4 Outfall OF-46	Residential

Drainage Area ID	Drainage Area (acres)	Outfall	Primary Contributing Drainage Area Type
OF-47	33.6450862	MS4 Outfall OF-47	Residential
OF-48	5.829974294	MS4 Outfall OF-48	Residential
OF-49	49.47436215	MS4 Outfall OF-49	Commercial
OF-50	4.497806298	MS4 Outfall OF-50	Commercial
OF-51	4.480221192	MS4 Outfall OF-51	Residential
OF-52	39.14063039	MS4 Outfall OF-52	Residential

Drainage Area ID	Drainage Area (acres)	Interconnection	Primary Contributing Drainage Area Type
IC-01	7.446813009	Interconnection to County MS4	Commercial
IC-02	35.72429819	Interconnection to County MS4	Residential
IC-03	11.92509475	Interconnection to County MS4	Residential
IC-04	10.52489228	Interconnection to County MS4	Residential
IC-06	33.38876611	Interconnection to County MS4	Residential
IC-10	114.5958079	Interconnection to County MS4	Residential
IC-11	1.774296036	Interconnection to County MS4	Residential
IC-12	225.8862777	Interconnection to County MS4	Residential
IC-13	3.082516154	Interconnection to County MS4	Residential
IC-14	4.164003011	Interconnection to County MS4	Residential
IC-16	3.492459214	Interconnection to Private MS4	Residential
IC-18	48.0846274	Interconnection to Private MS4	Residential
IC-20	12.65442525	Interconnection to Private MS4	Residential
IC-21	1.923136402	Interconnection to Private MS4	Residential
IC-22	26.03797678	Interconnection to Private MS4	Residential
IC-26	3.754782663	Interconnection to Private MS4	Residential
IC-27	3.602478315	Interconnection to Private MS4	Park/Open Space
IC-29	9.969719559	Interconnection to Private MS4	Residential
IC-36	65.70581324	Interconnection to NJDOT MS4	Residential
IC-37	8.408371593	Interconnection to NJDOT MS4	Park/Open Space
IC-38	8.402437493	Interconnection to NJDOT MS4	Park/Open Space
IC-40	7.840680132	Interconnection to Private MS4	Commercial
IC-41	6.96861386	Interconnection to Private MS4	Commercial
IC-42	22.05905141	Interconnection to Burlington Township MS4	Commercial
IC-43	1.427646449	Interconnection to Private MS4	Commercial
IC-44	337.7307506	Interconnection to NJDOT MS4	Park/Open Space
IC-45	4.529937726	Interconnection to County MS4	Residential
IC-46	0.119918134	Interconnection to County MS4	Residential
IC-47	1.558934605	Interconnection to County MS4	Commercial
IC-49	36.06740329	Interconnection to County MS4	Residential

Drainage Area ID	Drainage Area (acres)	Interconnection	Primary Contributing Drainage Area Type
IC-50	51.38874451	Interconnection to County MS4	Residential
IC-51	31.6100372	Interconnection to County MS4	Residential
IC-53	0.101868783	Interconnection to Private MS4	Park/Open Space
IC-55	5.617132818	Interconnection to Private MS4	Park/Open Space
IC-57	6.186776832	Interconnection to County MS4	Residential
IC-59	0.417611084	Interconnection to County MS4	Residential
IC-61	6.485465791	Interconnection to Private MS4	Commercial

TMDLs and Water Quality Impairments

In accordance with Section 305(b) and 303(d) of the Federal Clean Water Act, the State of New Jersey is required to assess the overall water quality of the State's waters and identify those waterbodies with a water quality impairment for which Total Maximum Daily Loads (TMDL) may be necessary. NJDEP fulfills its assessment obligation under the Clean Water Act through the Integrated Water Quality Monitoring and Assessment Report (Integrated Report), which includes the Integrated List of Waterbodies, issued biennially. The Integrated Report can be found at:

<https://dep.nj.gov/wms/bears/integrated-wq-assessment-report-2022>

The New Jersey Integrated Water Quality Assessment Report (Integrated Report) is a compilation of information about the quality of New Jersey's surface waters. The New Jersey Department of Environmental Protection (DEP) prepares the Integrated Report as a biennial assessment of statewide water quality that identifies and prioritizes waters for protection, restoration, and additional monitoring or research. The Integrated Report thus serves as an effective tool for enhancing, maintaining, and restoring water quality in all surface waters of the State to support their use for aquatic life, recreation, water supply, fish consumption, and shellfish harvest for consumption.

Under this obligation, NJDEP has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. The AMNET Program is a sampling program that supports the water quality inventory report and list of impaired waters. The AMNET site is found at:

<https://www.nj.gov/dep/wms/bfbm/amnet.html>

There are over 760 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrate by the NJDEP on a five-year cycle. Streams are classified as nonimpaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. Based on the Integrated Report, the Department identifies waterbodies for which a Total Maximum Daily Load (TMDL) may be necessary.

A Total Maximum Daily Load (TMDL) is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

Pathogens (Enterococcus, E. Coli, Fecal Coliform, Total Coliform)

Pathogens, including enterococcus, E. Coli, fecal coliform, and total coliform, enter the receiving wastes when stormwater comes into contact with sources of these pathogens, such as pet waste, animal waste from geese and other wildlife, some farming activities, illicit discharges, failing sewage conveyance systems and septic systems, combined sewage overflows, and sanitary sewer overflows (SSOs). While sewage treatment plants contribute a steady input of treated sewage to their receiving waters, stormwater runoff is the primary contributor to pathogen loads in surface waters of the state ([*Pollutants of Concern document*](#)).

When receiving surface waters include shellfish harvesting as a designated use, pathogens also pose additional concerns. Proximity to potential sources such as marinas, development served by septic systems and concentrated stormwater outfall locations warrant precautionary closures of shellfish waters on a seasonal or full-time basis. The National Shellfish Sanitation Program has established criteria for pathogens that are used to determine support of the shell fishing use ([*Pollutants of Concern document*](#)).

pH

pH (scientifically referred to as the Potential of Hydrogen) measures the concentration of hydrogen ions in a solution and is the indicator of the acidity or alkalinity of a substance, representing its ability to donate or accept hydrogen ions. pH values can range from 0 to 14, with 0 representing the most acidic and 14 representing the most basic. Fluctuations in pH and pH levels outside of the typical levels for a waterbody can negatively impact aquatic life, including reduced biodiversity if those values exceed critical thresholds. These impacts happen when the receiving waters experience even slight changes in pH levels that negatively impact reproduction, growth, and the ability to sustain life for species that live within them.

Pure water has a neutral pH equal to 7 but when chemicals or pollutants are mixed with stormwater runoff, the mixture can become either acidic or basic. Such is the case when stormwater comes into contact with ammonia, sulfur, battery acids, lime, cement, wet or fresh concrete, fertilizers, compost, and other pollutants. This mixing can happen on the ground with runoff, or can happen in the atmosphere with air pollutants causing “acid rain.” When acid rain or pH impacted storm water runoff collect in streams and ponds, the pH of that water body is changed.

Polychlorinated Biphenyls (PCBs)

The term ‘PCBs’ (Polychlorinated Biphenyls) represents a broad class of toxic industrial chemicals first discovered and synthesized in the late 19th century. Their novel chemical properties led to widespread industrial production and usage peaking between the 1930’s and late-1960’s. Some products may continue to contain PCBs, including electrical equipment, motor and hydraulic oils, oil-based paint, and some plastics. The recognition of PCB associated health hazards were first noted in the 1960’s and their production finally banned in 1979. PCBs can accumulate in the leaves and above-ground parts of plants and food crops. They are also taken up into the bodies of small organisms and fish. As a result, people who ingest fish may be exposed to PCBs that have bioaccumulated in the fish they are ingesting. Their oily nature allows them to accumulate in fatty animal tissues and bioaccumulate up the global food chain where they contribute to organ damage and carcinogenesis in higher-tiered species.

PCBs are easily carried away as TSS by stormwater runoff from products containing the compounds which are exposed to stormwater and known and unknown contaminated areas. PCBs have a moderate level of volatility, which means that their vapors are also readily carried aloft by the wind. They are then deposited on exposed surfaces via air deposition. (*Pollutants of Concern document*).

Volatile Organic Carbons (VOCs)

Volatile Organic Compounds (VOCs) is the name given to a large group of chemical compounds that vaporize into the air and can dissolve into the water from certain solids or liquids at varying rates. VOCs are released or “off-gassed” into the air by many products that are used to build and maintain motor vehicles and houses, such as paints, glues, caulk, solvents, fuels and other vehicle fluids, cleansers and disinfectants, aerosol sprays, pesticides, and wood preservatives. Common examples of VOCs are benzene, ethylene glycol, formaldehyde, methylene chloride, tetrachloroethylene, toluene, xylene, and 1,3butadiene. While many VOCs can cause adverse effects on aquatic life, there are also several adverse human health risks associated with encountering VOCs, including worsening asthma symptoms, cancer, liver and kidney damage, and central nervous system damage.

Stormwater can come in contact with VOCs from vehicle surfaces, roads, parking lots, driveways, and litter or other wastes. Once these improperly disposed materials containing VOCs encounter stormwater runoff they are discharged to the surface and ground waters of the state which are in turn used for drinking water supplies and the protection and propagation of aquatic life.

Surface water quality criteria serve to protect water quality for designated uses such as supporting the survival, growth, and reproduction of aquatic life, protecting the quality of drinking water sources, maintaining good water quality for primary and secondary contact recreational uses, and keeping fish safe for human consumption. (*Pollutants of Concern document*).

Florence's drinking water supply comes from the Potomac-Raritan-Magothy (PRM) aquifer system.

The NJDEP's Bureau of Environmental Analysis, Restoration and Standards has an interactive Geographic Information System (GIS) mapping tool, NJ-GeoWeb, that allows users to view and analyze various environmental data, including water quality. You can view water quality data for specific monitoring stations within the state's watersheds.

- **NJ-GeoWeb:** dep.nj.gov/wms/bears/water-quality-assessment/gis-and-resources/
- **NJDEP Open Data:** gisdata-njdep.opendata.arcgis.com/

Total Maximum Daily Load (TMDL) Information

Municipality and County

Florence Township
Burlington County

Total Maximum Daily Load (TMDL) Information for Selected Municipality:

Applicable Stream TMDL(s)

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

Mercury - 2010 : LDRV tribs (Assiscunk Ck to Blacks Ck) : [View the TMDL Document](#)

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

Polychlorinated Biphenyls (PCBs) - 2003 : Assiscunk Ck(Neck Rd to Jacksonville rd) : [View the TMDL Document](#)

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

Polychlorinated Biphenyls (PCBs) - 2003 : Crafts Creek (below Rt 206) : [View the TMDL Document](#)

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

Polychlorinated Biphenyls (PCBs) - 2003 : LDRV tribs (Bustleton Creek area) : [View the TMDL Document](#)

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

Polychlorinated Biphenyls (PCBs) - 2003 : LDRV tribs (Crystal Creek area) : [View the TMDL Document](#)

Applicable Lake TMDL(s)

None

Applicable Shellfish TMDL(s)

None

Below in Table 5 and Figure 6 summarize the information found using NJDEP's NJ-WET tool.

Table 5: TMDLs and Impairments for Sub watersheds within or bordering the Township of Florence

HUC14	Sub watershed Name	TMDL(s)	Impairment(s)
02040201090020	Crafts Creek (below Rt 206)	Polychlorinated Biphenyls (PCBs)	PCBs in Fish Tissue
		Volatile Organic Compounds (VOCs)	E. Coli
02040201090030	LDRV tribs (Crystal Creek area)	Polychlorinated Biphenyls (PCBs)	PCBs in Fish Tissue
		Volatile Organic Compounds (VOCs)	pH
02040201090040	LDRV tribs (Bustleton Creek area)	Polychlorinated Biphenyls (PCBs)	PCBs in Fish Tissue
		Volatile Organic Compounds (VOCs)	
02040201100050	Assiscunk Ck(Neck Rd to Jacksonville rd)	Polychlorinated Biphenyls (PCBs)	PCBs in Fish Tissue
		Volatile Organic Compounds (VOCs)	E. Coli
			Total Phosphorus

Overburdened Communities *(for Tier A permittees only)*

Florence Township in Burlington County, New Jersey, has been designated as an overburdened community due to meeting the state's criteria, which include a significant percentage of low-income, minority, or limited English proficiency households. Specific data shows that at least one census block group in Florence Township qualifies as an "Overburdened Community" (OBC) under New Jersey's Environmental Justice Law. The New Jersey Department of Environmental Protection (NJDEP) has published maps and data identifying these specific census block groups that meet the criteria for being overburdened.

- **Overburdened Community (OBC) Criteria:**

To be designated as an overburdened community, a census block group must meet at least one of the following conditions:

- At least 35% of households are low-income.
- At least 40% of residents are minority or members of a state-recognized tribal community.
- At least 40% of households have limited English proficiency.

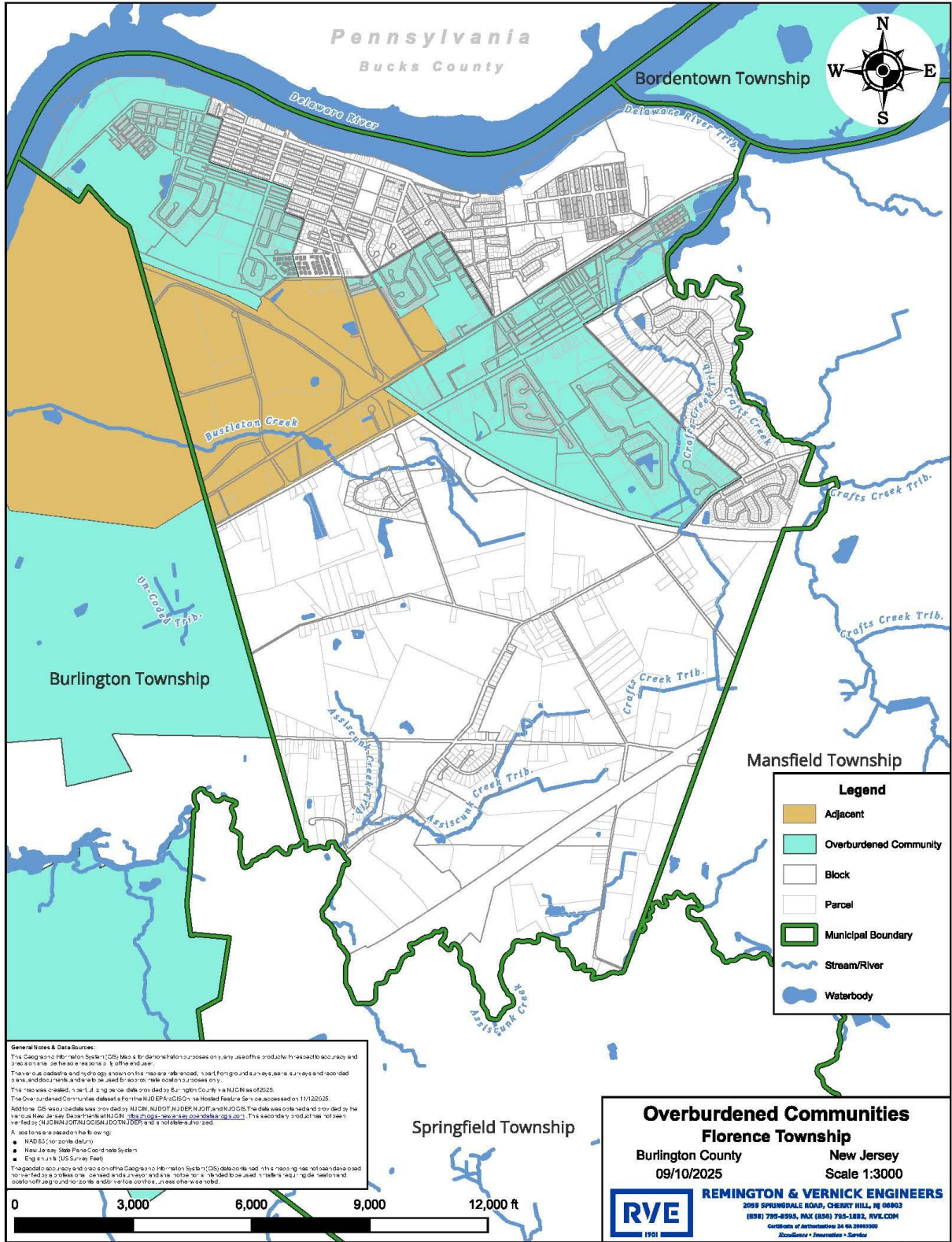
- **Florence Township Data:**

The NJDEP has officially identified and mapped the specific census block groups within Florence Township that qualify as overburdened communities.

- **Purpose of the Designation:**

This designation is part of New Jersey's Environmental Justice Law, which requires the NJDEP to evaluate the environmental and public health impacts of certain facilities on these communities and apply stricter review to permits for new or expanded facilities in these areas.

Figure 7: Overburdened Communities within the Township of Florence



Impervious Area

Information regarding impervious cover was gathered using NJ-WET and NJDEP Open Data. Within the Township of Florence, there is approximately 1473 acres of impervious area, which consist of around 23% of the total area of the Township. Of the total impervious area, 23% is in the Crafts Creek HUC 14, 9% is in the LDRV tribs (Crystal Creek Area) HUC 14, 56% is in the LDRV tribs (Bustleton Creek Area) HUC 14, and 12% is in the Assiscunk Creek HUC14. The impervious areas within the Township are detailed in Table 6 and shown below in Figure 7.

Impervious cover can have considerable impacts on ecosystem and stream health. Due to an increase in stormwater runoff caused by impervious cover, the potential for pollutants to be carried to streams and rivers increases, which in turn can impact stream quality. Additionally, stormwater runoff discharging into streams increases the volume of water traveling within those streams. Increases in stream volume can lead to changes in stream conditions as it reaches equilibrium, such as increases in erosion, sediment load, and other stream attributes.

Using Scheuler’s Model of Impervious Cover (Schueler,2009), which predicts stream quality based on the corresponding impervious cover in the corresponding watershed, the following conclusions can be drawn about the streams in the HUC14 sub watersheds of Florence:

- Crafts Creek (below Rt 206) and LDRV tribs (Crystal Creek area) have an “impacted” stream quality
- LDRV tribs (Bustleton Creek area) has a “non-supporting” stream quality
- Assiscunk Ck (Neck Rd to Jacksonville rd) has a “sensitive” stream quality

Table 6: Impervious Coverage by HUC14 Sub watersheds within the Township of Florence

HUC14	Subwatershed Name	Impervious Acres	HUC14 Acres	HUC14 % Impervious	% Impervious Building	% Impervious Road	% Impervious Other
02040201100050	Assiscunk Ck(Neck Rd to Jacksonville rd)	177.22	1994.91	8.88%	16%	45%	39%
02040201090020	Crafts Creek (below Rt 206)	341.01	1468.65	23.21%	22%	34%	44%
02040201090040	LDRV tribs (Bustleton Creek area)	825.10	2483.76	33.21%	23%	29%	47%
02040201090030	LDRV tribs (Crystal Creek area)	129.63	562.49	23.04%	20%	26%	54%

Non-Municipally Owned or Operated Stormwater Facilities *(for Tier A permittees only)*

There are 48 stormwater facilities within the Township of Florence that are not municipally owned. These are all designed stormwater basins. Their locations are shown in 9 below as well as summarized in Table 7.

Table 7: Non-municipally Owned/Operated Stormwater Infrastructure in the Township of Florence

Basin ID	Project Name	HUC14	Project Block	Project Lot	Basin Type
107078	Shopping Plaza	02040201090040	159	5.02	Infiltration
103852	Hamilton Farms	02040201090040	151	1.01	Detention
108520	Quaker Group	02040201090020	165.01	2.01	Detention
111757	Quaker Group	02040201090020	165.01	2.01	Detention
112041	Quaker Group	02040201090020	165.01	2.01	Detention
112143	Dresner Storage	02040201090040	160.01	3	Detention
112252	Florence Twp Middle School Addition	02040201090040	83	1	Detention
108038	NFI Warehouse Site	02040201090040	160.01	2.01	Infiltration
106038	Roebling Station Parking	02040201090020	139	1	Detention
110127	Eckerd Pharmacy	02040201090040	99.01	22	Detention
107179	2071 Rt 130	02040201090040	162	5	Retention \ Wet Pond
108478	Mallard Creek sections 1 & 2	02040201090020	166	2	Detention
109016	Mallard Creek sections 1 & 2	02040201090020	166	2	Detention
103873	Ready Pac	02040201090040	147.01	3.11 3.01	Retention \ Wet Pond
107141	Ready Pac	02040201090040	147.01	3.11 3.01	Retention \ Wet Pond
110135	Ready Pac	02040201090040	147.01	3.11 3.01	Retention \ Wet Pond
100487	Soil Recycling Facility	02040201100050	174	2	Infiltration
103112	Soil Recycling Facility	02040201100050	174	2	Infiltration
109176	Drainage Improvements	02040201090040	179	1.02	Retention \ Wet Pond
100167	Florence Meadows	02040201090040	155	3	Detention
103703	Florence Meadows	02040201090040	155	3	Detention
108652	Florence Meadows	02040201090040	155	3	Detention
108389	Wawa	02040201090040	163.02	13.01 13.02 13.	Detention
106786	Burger King	02040201090040	163.02	6	Detention
107427	Michael Sassman	02040201090030	126.02	1.02	Infiltration \ Detention
101743	Continueing Care Concepts	02040201090040	155.49	54.05	Infiltration

Basin ID	Project Name	HUC14	Project Block	Project Lot	Basin Type
107099	Oak Mill	02040201090040	156.01	2	Retention \ Wet Pond
103210	Florence Fire Hall	02040201090040	155.47	10.01	Retention \ Wet Pond
106993	Florence Fire Hall	02040201090040	155.47	10.01	Retention \ Wet Pond
108712	Florence Fire Hall	02040201090040	155.47	10.01	Infiltration
100810	Tidewater Farms	02040201090020	166	4.01	Detention
109367	Tidewater Farms	02040201090020	166	4.01	Detention
108966	Rt 130 Interchange	02040201090040	163.01	5	Detention
109466	Florence Speculative Building 3	02040201090040	158	1	Detention
110397	Preserve at Brookside	02040201090020	165.01	5.08	Detention
104778	Florence Station	02040201090040	158	7.02	Detention
105398	Florence Station	02040201090040	158	7.02	Detention
106921	Albax	02040201090020	100	8.03	Infiltration
103616	Gallina Plaza	02040201090020	110	3.01 8.01	Infiltration \ Detention
110342	Haines Industrial Center	02040201090040	158	1	Detention
112144	Roebing Bank	02040201090020	109	1	Retention \ Wet Pond
114669	Cedar Lane South Industrial Park	02040201090040	155.47	12.02	Infiltration
114670	Cedar Lane South Industrial Park	02040201090040	155.47	12.02	Infiltration
114671	Cedar Lane South Industrial Park	02040201090040	155.47	12.02	Infiltration
115303	Proposed Convenience Store and Fueling Station	02040201090040	160.01	1.02	Detention
115602	Lennar at Florence	02040201090020	165.04	63	Retention \ Wet Pond
116185	Primestone	02040201090040	163.02	13.02	Infiltration
117473	2001 Route 130 Associates, LLC	02040201090040	159.02	6.01, 9, 10	Infiltration \ Detention

Conclusion

This Watershed Inventory Report, Phase 1 of the Watershed Improvement Plan, identifies stormwater infrastructure, as required in the MS4 permits. It also summarizes water quality data, including stream classifications, TMDLs, and water quality impairments. The data that accompanies this inventory report has been compiled as an electronic map and submitted to the NJDEP through NJDEP Online via the Document Submittal Service. The information from this inventory report will be used to make informed decisions during the creation of the Watershed Assessment Report, Phase 2 of the Watershed Improvement Plan. The work done in Phase 2 will identify areas of potential concern and where potential water quality improvement projects may be implemented to address any water quality and quantity issues identified in this inventory report.

APPENDIX A
FEMA National Flood Layer Viewer Street List

MUN	FLORENCE TWP	
	Street Name	Length Affected
100 Year Flood Zone	Cedar Lane	164.79
	Hegy Court	344.61
	Hornberger Avenue	961.56
	John Galt Way	113.66
	Old York Road	112.47
	Potts Mill Road	84.85
	West Front Street	333.53
500 Year Flood Zone	Hornberger Avenue	60.11
	West Front Street	367.77

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