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Watershed Inventory Report

Phase 1 of the Watershed Improvement Plan –
REVISED DRAFT (May, 2026)

NEPTUNE TOWNSHIP
MONMOUTH COUNTY

Date Approved: *Pending*

Permit Number: NJG0150631

Stormwater Program Coordinator: Terence Vogt, PE

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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
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 subwatershed, 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 sewerage 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.
    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 wasteload 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 Monmouth 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)

Acknowledgements

Neptune Township's Phase 1 Watershed Inventory Plan (WIP) report was prepared by Remington & Vernick, Engineers. Funding for preparation of the plan was provided by Neptune Township.

This WIP Inventory Report was prepared using NJDEP-GIS stormwater infrastructure mapping data obtained by RVE; which was funded in-part by a $25,000 NJDEP stormwater mapping grant provided to Neptune Township.

Regional Collaboration

Neptune Township has not collaborated regionally in the preparation of this Phase 1 Inventory Report. At Neptune's discretion it may choose to collaborate for preparation of Phase 2 and Phase 3 reports due January 1, 2027 and December 31, 2027, respectively.

Introduction

The purpose of this watershed inventory report is to provide a comprehensive understanding of key, defining features within the watersheds throughout Neptune Township. This involves gathering, organizing, and presenting information about existing conditions and infrastructure within each watershed. It aims to serve as a tool for informed decision-making, planning, and implementation of sustainable watershed management strategies aimed to protect and enhance the health of the watershed, its associated ecosystems, and the surrounding communities.

Located in Monmouth County in central New Jersey, Neptune Township covers over 8.8 square miles and is located west of Asbury Park and Belmar Borough, adjoining Neptune City (north), east the Garden State Parkway and north of Interstate 195. Its municipal address is 25 Neptune Boulevard, Neptune, NJ 07753.

According to ***2020 Census data***, Neptune, NJ had a population of approximately 28,061, The township's population was 46% White, 30% Black, 3% Asian, and 3% Hispanic. Other demographic data includes a median age of 43.1 years and a median household income of approximately $50,154 (based on 2010-2014 data). Additional demographic information is listed below:

- **Age:**
  - Median age: 43.1 years
  - Percentage under 18: 18.4%
  - Percentage 65 and older: 15.3%
- **Households:**
  - Average household size: 2.24
  - Percentage of households with married couples: 38.8%
  - Percentage of non-family households: 42.8%
- **Income (2006-2010 data):**
  - Median household income: $50,154
  - Median family income: $72,313
  - Per capita income: $31,172
  - Percentage of families below the poverty line: 3.0%

From the 2012 Neptune Township, Comprehensive NJ Master Plan Re-examination (by CME Associates)

The Township of Neptune has been approaching build-out of its vacant developable parcels. The Township of Neptune is comprised of a variety of land uses, including residential, retail, office, public and institutional uses and a nominal amount of light industrial uses.

Residential uses comprise the single largest land use category in Neptune Township. As indicated above, out of all of the parcels in the Township, nearly 87% are currently being utilized as a residential single-family, two-family, or three-family home. In addition, approximately 1% of the parcels in the Township are being utilized as apartments. Residential land uses comprise over 42% of the developable acres of the Township. The second and third largest land uses in terms of acreage are public and commercial land uses, which each comprise approximately 16% of the total developable acreage of the Township. Vacant land comprises roughly 12% of the remaining developable land of the Township. However, it should be noted that although 12% of the developable land area or 513 acres remains vacant.

A significant portion of this undeveloped area is located within the High Pointe – Route 18 Redevelopment area, comprised of approximately 166 acres, while the balance of the vacant parcels are relatively small in nature and many may not be developable due to size, location, environmental constraints, easements, and deed restrictions among other things. In addition, many of the vacant parcels are existing open spaces for condominium developments, buffer and transitional areas.

the Township has essentially approached buildout and the actual vacant and developable land that remains is considerably less than what is depicted above. As such, there are few opportunities in the Township for the new development of nonresidential or residential uses on currently vacant properties.

Slightly over 87% of the total parcels in Neptune Township, which are listed on the property tax files are classified as residential. Single-family housing is the predominant type of dwelling unit. While there are a number of two and three-family dwelling units, there are also several other

multifamily residential dwellings, including apartment buildings of various types and configurations.

Commercial uses account for 414 parcels or 3.73% of the total parcels in Neptune Township. Commercial uses are found throughout the Township, but the most prevalent areas are along the Route 33, Route 35 and Route 66 corridors.

There are three industrially zoned districts in the Township. Industrial uses have diminished significantly in the Township. There is an existing LI zone Old Corlies Avenue, as well as one along 5th and Ridge Avenues, along the Township border with the Borough of Bradley Beach.

The largest and most significant institutional use in the Township is the Jersey Shore University Medical Center. Jersey

Neptune Township contains portions of six (6) HUC-14 watersheds, listed below:

Watershed Management Area 12 (Monmouth)

- Shark River (below Remsen Mill gage)- HUC 02030104090060, Dissolved Oxygen, PCBs in Fish Tissue Impaired
- Shark River (above Remsen Mill gage) – HUC-14 02030104090040, PCB in Fish Tissue Impaired
- Jumping Brook (Ocean Co) – HUC-14 02030104090050, no impairments
- Deal Lake – HUC-14 02030104090090, E Coli Impaired
- Atlantic Coast (Whale Pond to Shark R) - HUC-14 02030104930010, Dissolved Oxygen Impairment.
- Atl drainage (Shark R - Deal Lk) – HUC-14 02030104090090, E Coli Impairment

Neptune Township contains several significant surface water bodies, including portions of the Atlantic Ocean, the Shark River estuary, and the three interconnected coastal lakes: Deal Lake, Fletcher Lake, and Wesley Lake.

Major Surface Water Bodies

- Atlantic Ocean: Neptune Township's eastern border (specifically the Ocean Grove section) is the Atlantic Ocean.
- Shark River/Shark River Bay: This estuary forms the majority of the Township's southern border and drains into the Atlantic Ocean.
- Deal Lake, Fletcher Lake, and Wesley Lake: These are small, dammed coastal lakes that form parts of the northern and eastern borders with neighboring municipalities like Asbury Park and Bradley Beach.

Streams and Tributaries

The Township's inland areas drain into the Shark River watershed via several brooks and streams, including:

- Jumping Brook
- Musquash Brook
- Wells Brook
- Hankins Brook
- Hollow Brook (a tributary of Deal Lake)
- Robins Swamp Brook
- Sarah Green Brook

Neptune Township is primarily located in the Shark River Watershed, which is part of Watershed Management Area 12 (WMA 12). Some northern and eastern areas of the township drain into Deal Lake and Wesley Lake, which also contribute to the coastal drainage system in WMA 12.

- Shark River Watershed: The majority of Neptune Township's drainage flows into the Shark River. The Shark River drains into the Atlantic Ocean through Shark River Inlet.

- Deal Lake and Wesley Lake: A portion of the northern part of the township drains into Deal Lake, and the eastern part drains into Wesley Lake, which then flows into the Atlantic Ocean.

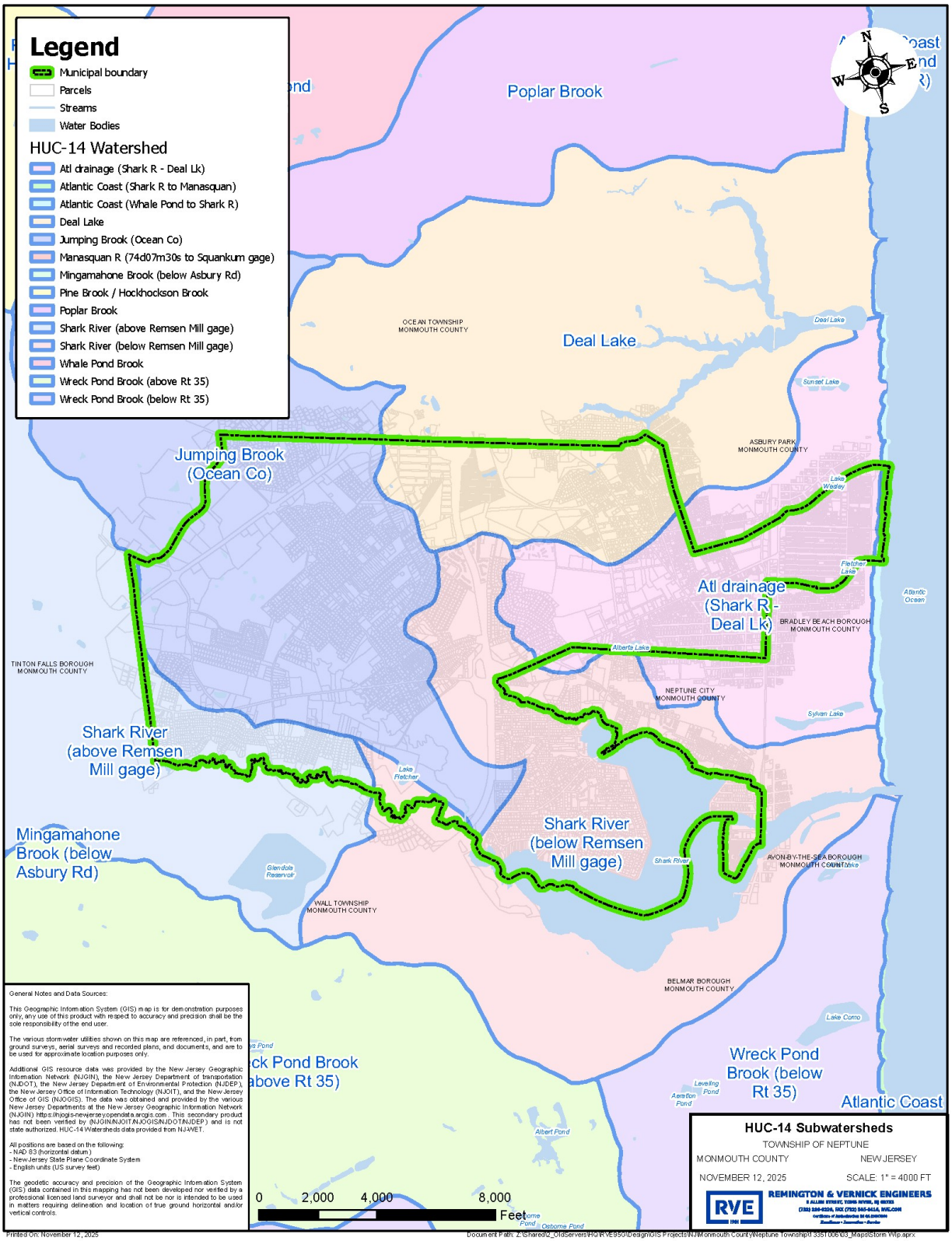
- Watershed Management Area 12 (WMA 12): Both the Shark River and the Deal Lake/Wesley Lake systems are part of this larger coastal watershed area, which covers numerous municipalities in Monmouth, Middlesex, and Ocean counties.

Neptune Township has significant flooding problems due to its proximity to the Atlantic Ocean, Shark River, coastal lakes, and numerous streams. These issues are worsened by coastal storms, heavy rainfall, and high tides, leading to both widespread disruptions and localized, severe damage in areas like Shark River Hills. Major past floods include Hurricane Sandy in 2012, which caused flooding to a high of 14.1 feet.

Causes and types of flooding

- **Coastal and storm-driven flooding:** Strong winds, rough seas, and storm surges cause significant flooding, as seen during Hurricane Sandy and other events.
- **Rainfall and high tides:** Regular heavy rain events and high tides can cause flooding in addition to major storms, affecting areas near the numerous water bodies within the township.
- **Vulnerable areas:** Specific neighborhoods like Shark River Hills are particularly vulnerable, but flooding impacts the entire township by closing roads, disrupting utilities, and affecting all residents to some degree.
- **Increasing risk:** Climate change is contributing to higher seas and stronger storms, which is projected to increase flooding risk in the future.

Figure 1: HUC14 sub watersheds within the Township of Neptune



Public Participation (Neptune Township Phase 1 WIP Inventory Report)

- **List of stakeholders**

  The Phase 1 Watershed Inventory Report (WIP) was prepared for Neptune Township by Remington & Vernick, Engineers (RVE).

  Stakeholders for this plan include Neptune Township, Neptune Township Committee, Neptune Township Planning Board, Neptune Township Zoning Board and the Neptune Township Department of Public Works (DPW).

- **List of Previously Held Meetings (Neptune February 9, 2026 Committee meeting)**

  Neptune Township shall solicit input from stakeholders, including residents, business owners, owners of private stormwater facilities (as per b.xiii below), and other municipalities and/or dischargers to the subwatershed(s) to be involved in the Plan development process The first of two (2) public hearings was held February 9, 2026).

- **Summary of Feedback**

  There was no public feedback (comments or questions) during the February 9, 2026 public hearing.

- **Future Scheduled Meetings**

  A second (and final) semi-annual public information session shall be held by or before July, 2026. The final draft of the Phase 1 Watershed Inventory Report will be available on Neptune Township's Stormwater Webpage at the link below:

  https://www.Neptunenj.gov/department/stormwater

  The second meeting date and time will be advertised on Neptune's municipal website:

  https://www.Neptunenj.gov/

Stormwater Outfall(s)

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

Receiving Surface Water Bodies & Water Quality Classifications

Stream bodies in the majority of the Township are classified as ***Freshwater Non-Trout, Saline Estuary (FW2-NT/SE1).*** This acronym stands for:

- **FW2**: Freshwater 2 (a general classification for freshwaters not designated as FW1 or Pinelands waters).

- **NT**: Non-Trout (waters that are not capable of sustaining a natural or stocked trout population).

- **SE1:** This sub-classification applies to the saline (saltwater) portion of the water body and designates it as "saline estuarine 1." This is the highest quality classification for saline waters, indicating it supports uses like swimming and shellfish harvesting

Stream bodies along the southern boundary of the Township, feeding into the Shark River are classified as ***Freshwater Trout Maintenance, Category 1 (FW2-TMC1).*** This acronym stands for:

- **FW2**: General freshwater classification for waters not designated as FW1 or Pinelands Waters.

- **TM**: Trout Maintenance. The water is designated for the support of trout throughout the year.

- **C1**: Category One. This is a high-level antidegradation designation that protects the water's quality from any measurable changes. This classification often includes waters with high ecological significance.

Table 2: Receiving Surface Water Bodies & Water Quality Classification

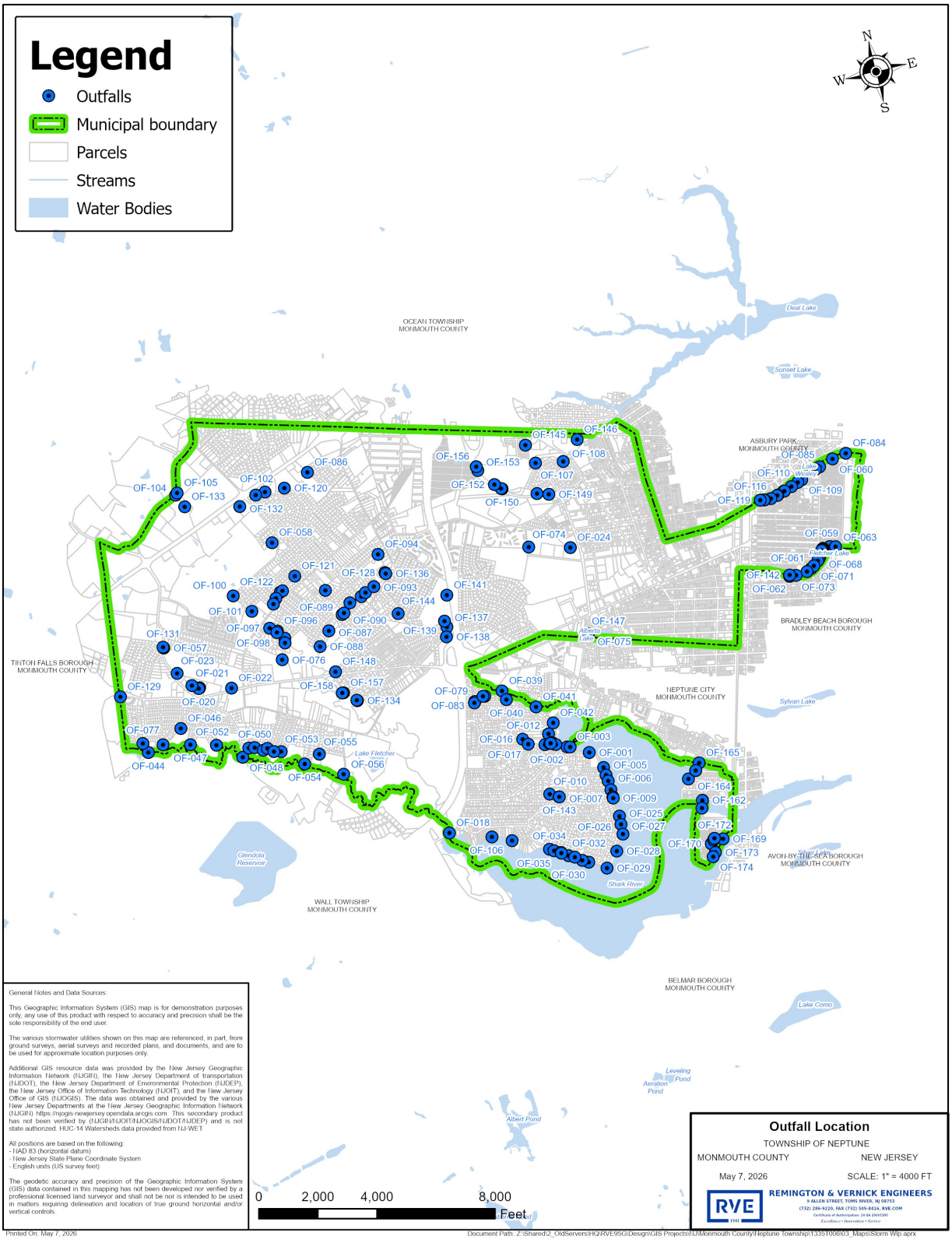
Local Outfall ID	Receiving Surface Water Body	Water Quality Classification
OF-001	Shark River	SE1
OF-002	Shark River	SE1
OF-003	Shark River	SE1
OF-004	Shark River	SE1
OF-005	Shark River	SE1
OF-006	Shark River	SE1
OF-007	Shark River	SE1
OF-008	Shark River	SE1
OF-009	Shark River	SE1
OF-010	Musquash Brook tributary	SE1
OF-011	Musquash Brook tributary	SE1
OF-012	Musquash Brook	SE1
OF-013	Musquash Brook Tributary	SE1
OF-014	Musquash Brook tribuary	SE1
OF-015	Musquash Brook tribuary	SE1
OF-016	Musquash Brook tributary	SE1
OF-017	Musquash Brook tributary	SE1
OF-018	Shark River	SE1
OF-021	Wells Brook	FW2-NT/SE1
OF-023	Wells Brook	FW2-NT/SE1
OF-024	Wetlands	
OF-025	Shark River	SE1
OF-026	Shark River	SE1
OF-027	Shark River	SE1
OF-028	Shark River	SE1
OF-029	Shark River	SE1
OF-030	Shark River	SE1
OF-031	Shark River	SE1
OF-032	Shark River	SE1
OF-033	Shark River	SE1
OF-034	Shark River	SE1
OF-035	Shark River	SE1
OF-036	Shark River	SE1
OF-037	Shark River	SE1
OF-038	Shark River	SE1
OF-039	Musquash Brook	SE1
OF-040	Musquash Brook	SE1
OF-041	Musquash Brook	SE1
OF-042	Musquash Cove	SE1
OF-043	Musquash Brook	SE1
OF-044	Shark River	FW2-TMC1

Local Outfall ID	Receiving Surface Water Body	Water Quality Classification
OF-045	Shark River	FW2-TMC1
OF-046	Shark River	
OF-047	Shark River	FW2-TMC1
OF-048	Shark River	FW2-TMC1
OF-049	Shark River	FW2-TMC1
OF-050	Shark River	FW2-TMC1
OF-051	Shark River	FW2-TMC1
OF-052	Shark River	FW2-TMC1
OF-053	Shark River	FW2-TMC1
OF-054	Shark River	FW2-TMC1
OF-055	Shark River	FW2-TMC1
OF-056	Shark River	FW2-TMC1
OF-057	Wells Brook	FW2-NT/SE1
OF-058	Jumping Brook tributary	FW2-NT/SE1
OF-059	Fletcher Lake	
OF-060	Lake Wesley	
OF-061	Fletcher Lake	
OF-062	Fletcher Lake	
OF-063	Fletcher Lake	
OF-064	Fletcher Lake	
OF-065	Fletcher Lake	
OF-066	Fletcher Lake	
OF-067	Fletcher Lake	
OF-068	Fletcher Lake	
OF-069	Fletcher Lake	
OF-070	Fletcher Lake	
OF-071	Fletcher Lake	
OF-072	Fletcher Lake	
OF-073	Fletcher Lake	
OF-074	Wetlands	
OF-075	Alberta Lake	
OF-076	Jumping Brook	FW2-NT/SE1
OF-077	Shark River	FW2-TMC1
OF-078	Shark River	FW2-TMC1
OF-079	Musquash Brook	SE1
OF-080	Musquash Brook tribuary	SE1
OF-081	Musquash Brook tribuary	SE1
OF-082	Musquash Brook tribuary	SE1
OF-083	Musquash Brook	SE1
OF-084	Lake Wesley	
OF-085	Lake Wesley	
OF-086	Jumping Brook tributary	FW2-NT/SE1
OF-087	Hankins Brook	FW2-NT/SE1

Local Outfall ID	Receiving Surface Water Body	Water Quality Classification
OF-088	Hankins Brook	FW2-NT/SE1
OF-089	Hankins Brook	FW2-NT/SE1
OF-090	Hankins Brook	FW2-NT/SE1
OF-091	Hankins Brook	FW2-NT/SE1
OF-092	Hankins Brook	FW2-NT/SE1
OF-093	Hankins Brook	FW2-NT/SE1
OF-094	Hankins Brook	FW2-NT/SE1
OF-095	Jumping Brook	FW2-NT/SE1
OF-096	Jumping Brook	FW2-NT/SE1
OF-097	Jumping Brook	FW2-NT/SE1
OF-098	Jumping Brook	FW2-NT/SE1
OF-099	Jumping Brook	FW2-NT/SE1
OF-100	Jumping Brook	FW2-NT/SE1
OF-101	Jumping Brook	FW2-NT/SE1
OF-102	Jumping Brook tributary	FW2-NT/SE1
OF-103	Jumping Brook tributary	FW2-NT/SE1
OF-104	Jumping Brook	FW2-NT/SE1
OF-105	Jumping Brook	FW2-NT/SE1
OF-106	Shark River	SE1
OF-107	Hollow Brook	FW2-NT/SE1
OF-108	Hollow Brook	FW2-NT/SE1
OF-109	Lake Wesley	
OF-110	Lake Wesley	
OF-111	Lake Wesley	
OF-112	Lake Wesley	
OF-113	Lake Wesley	
OF-114	Lake Wesley	
OF-115	Lake Wesley	
OF-116	Lake Wesley	
OF-117	Lake Wesley	
OF-118	Lake Wesley	
OF-119	Lake Wesley	
OF-120	Jumping Brook tributary	FW2-NT/SE1
OF-121	Jumping Brook tributary	FW2-NT/SE1
OF-122	Jumping Brook tributary	FW2-NT/SE1
OF-123	Jumping Brook tributary	FW2-NT/SE1
OF-124	Jumping Brook tributary	FW2-NT/SE1
OF-125	Jumping Brook tributary	FW2-NT/SE1
OF-126	Hankins Brook	FW2-NT/SE1
OF-127	Hankins Brook	FW2-NT/SE1
OF-128	Hankins Brook	FW2-NT/SE1
OF-129	Wetlands	
OF-130	Wells Brook	FW2-NT/SE1

Local Outfall ID	Receiving Surface Water Body	Water Quality Classification
OF-131	Wells Brook	FW2-NT/SE1
OF-132	Jumping Brook tributary	FW2-NT/SE1
OF-133	Jumping Brook	FW2-NT/SE1
OF-134	Jumping Brook tributary	FW2-NT/SE1
OF-135	Jumping Brook tributary	FW2-NT/SE1
OF-136	Hankins Brook	FW2-NT/SE1
OF-137	Wetlands	
OF-138	Wetlands	
OF-139	Wetlands	
OF-140	Forested	
OF-141	Wetlands	
OF-142	Fletcher Lake	
OF-143	Musquash Brook tributary	SE1
OF-144	Woods	
OF-145	Hollow Brook tributary	FW2-NT/SE1
OF-147	Arnolad Lake	
OF-148	Jumping Brook	FW2-NT/SE1
OF-149	Hollow Brook tributary	FW2-NT/SE1
OF-150	Hollow Brook	FW2-NT/SE1
OF-151	Hollow Brook	FW2-NT/SE1
OF-152	Hollow Brook	FW2-NT/SE1
OF-153	Hollow Brook	FW2-NT/SE1
OF-154	Lake Wesley	
OF-155	Hollow Brook tributary	FW2-NT/SE1
OF-156	Hollow Brook	FW2-NT/SE1
OF-157	Jumping Brook	FW2-NT/SE1
OF-158	Jumping Brook	FW2-NT/SE1
OF-159	Musquash Brook	SE1
OF-160	Musquash Brook tributary	SE1
OF-161	Shark River	FW2-TMC1
OF-162	SharkRiver	SE1
OF-163	Shark River	SE1
OF-164	Shark River	SE1
OF-165	Shark River	SE1
OF-166	Shark River	SE1
OF-167	Shark River	SE1
OF-168	Shark River	SE1
OF-169	Shark River	SE1
OF-170	SHark River	SE1
OF-171	Shark River	SE1
OF-172	Shark River	SE1
OF-173	Shark River	SE1
OF-174	Shark River	SE1

Figure 2: Township of Neptune Stormwater Outfalls



Stormwater Interconnection(s)

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

Interconnections from the permittee's MS4 into another entity

- There are 39 interconnections from the Township of Neptune's MS4 infrastructure into other entities MS4 systems.
- All these interconnections are directed piped connection.
- One of these interconnections conveys stormwater to infrastructure owned and operated by Asbury Park.
- Eighteen of these interconnections convey stormwater to infrastructure owned and operated by The State of New Jersey.
- Seven of these interconnections convey stormwater to infrastructure owned and operated by private MS4s.
- Thirteen of these interconnections convey stormwater to infrastructure owned and operated by Monmouth County.

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

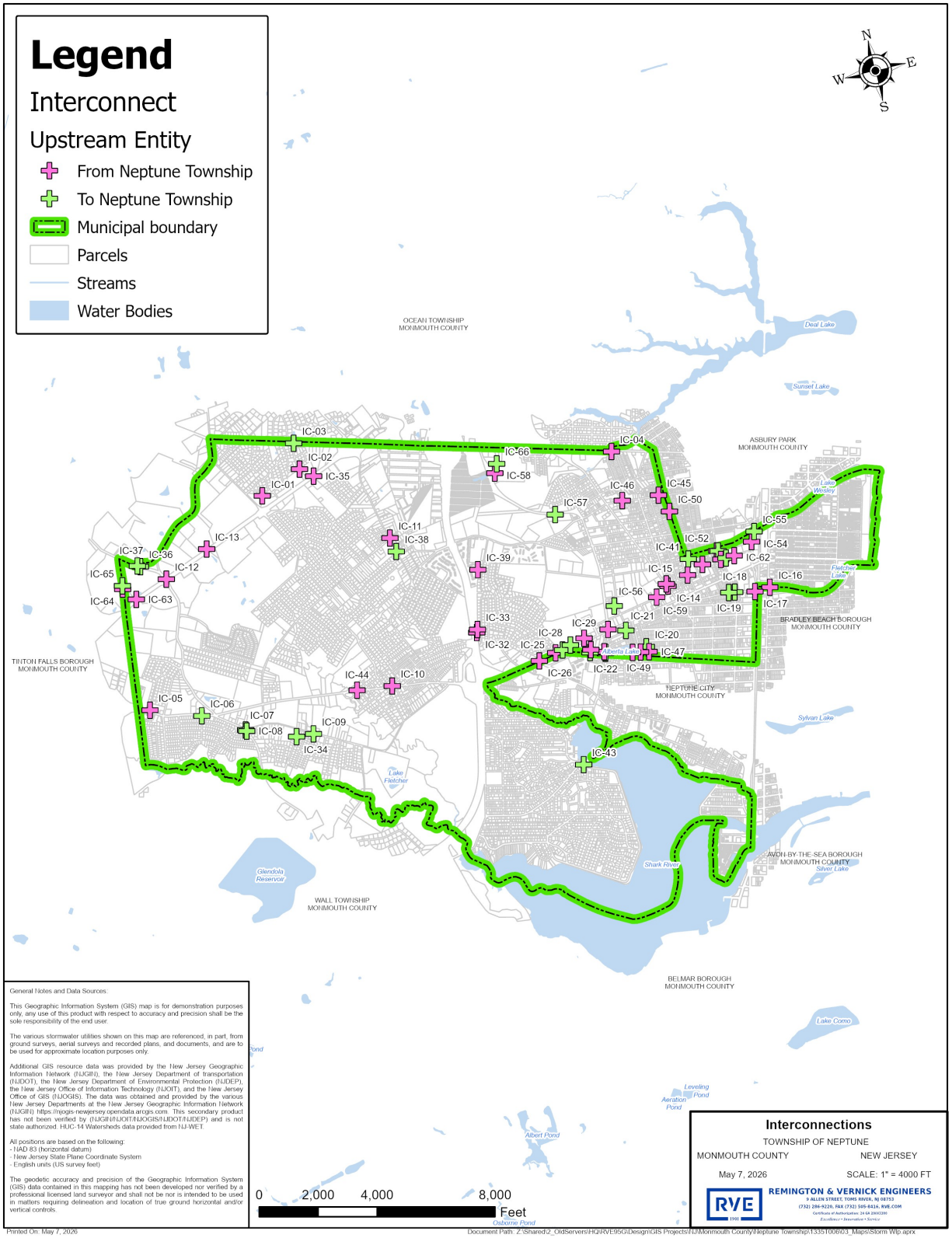
- There are Nine interconnections owned and operated by Monmouth County that convey stormwater flow to infrastructure owned and operated by the Township of Neptune.
- There are seven interconnections owned and operated by private entities that convey stormwater flow to infrastructure owned and operated by the Township of Neptune.
- There are two interconnections owned and operated by Township that convey stormwater flow to infrastructure owned and operated by the Township Neptune.
- There are eight interconnections owned and operated by The State of New Jersey that convey stormwater flow to infrastructure owned and operated by the Township Neptune.
- There are two interconnections owned and operated by Ocean Township that convey stormwater flow to infrastructure owned and operated by the Township of Neptune. There is one interconnection owned and operated by Neptune City that conveys stormwater flow to infrastructure owned and operated by the Township of Neptune.
- All interconnections are directed piped connection.

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

Local ID	Type	Upstream Entity	Downstream Entity
IC-01	Pipe	Neptune Township	State
IC-02	Pipe	Neptune Township	State
IC-03	Pipe	Monmouth County	Neptune Township
IC-04	Pipe	Neptune Township	Monmouth County
IC-05	Pipe	Neptune Township	State
IC-06	Pipe	State	Neptune Township
IC-07	Pipe	State	Neptune Township
IC-08	Pipe	State	Neptune Township
IC-09	Pipe	State	Neptune Township
IC-10	Pipe	Neptune Township	State
IC-11	Pipe	Neptune Township	Monmouth County
IC-12	Pipe	Neptune Township	State
IC-13	Pipe	Neptune Township	State
IC-14	Pipe	Neptune Township	State
IC-15	Pipe	Neptune Township	State
IC-16	Pipe	Neptune Township	State
IC-17	Pipe	Neptune Township	Monmouth County
IC-18	Pipe	Monmouth County	Neptune Township
IC-19	Pipe	Monmouth County	Neptune Township
IC-20	Pipe	Private	Neptune Township
IC-21	Pipe	State	Neptune Township
IC-22	Pipe	Monmouth County	Neptune Township
IC-23	Pipe	Monmouth County	Neptune Township
IC-24	Pipe	Neptune Township	Monmouth County
IC-25	Pipe	Neptune Township	State
IC-26	Pipe	Neptune Township	State
IC-27	Pipe	State	Neptune Township
IC-28	Pipe	State	Neptune Township
IC-29	Pipe	Neptune Township	State
IC-30	Pipe	Monmouth County	Neptune Township
IC-31	Pipe	Neptune Township	Monmouth County
IC-32	Pipe	Neptune Township	State
IC-33	Pipe	Neptune Township	State
IC-34	Pipe	State	Neptune Township
IC-35	Pipe	Neptune Township	State
IC-36	Pipe	Ocean Township	Neptune Township
IC-37	Pipe	Ocean Township	Neptune Township
IC-38	Pipe	Private	Neptune Township
IC-39	Pipe	Neptune Township	Private
IC-40	Pipe	Neptune Township	Private
IC-41	Pipe	Neptune City	Neptune Township
IC-42	Pipe	Neptune Township	Private

Local ID	Type	Upstream Entity	Downstream Entity
IC-43	Pipe	Monmouth County	Neptune Township
IC-44	Pipe	Neptune Township	State
IC-45	Pipe	Neptune Township	Monmouth County
IC-46	Pipe	Neptune Township	Monmouth County
IC-47	Pipe	Neptune Township	Monmouth County
IC-48	Pipe	Neptune Township	Monmouth County
IC-49	Pipe	Neptune Township	Monmouth County
IC-50	Pipe	Neptune Township	Asbury Park
IC-51	Pipe	Neptune Township	NJDOT
IC-52	Pipe	Neptune Township	Monmouth County
IC-53	Pipe	Monmouth County	Neptune Township
IC-54	Pipe	Neptune Township	Monmouth County
IC-55	Pipe	Monmouth County	Neptune Township
IC-56	Pipe	Private	Neptune Township
IC-57	Pipe	Private	Neptune Township
IC-58	Pipe	Neptune Township	Private
IC-59	Pipe	Neptune Township	Private
IC-60	Pipe	Neptune Township	Monmouth County
IC-61	Pipe	Private	Neptune Township
IC-62	Pipe	Neptune Township	Private
IC-63	Pipe	Neptune Township	State
IC-64	Pipe	Neptune Township	Private
IC-65	Pipe	Private	Neptune Township
IC-66	Pipe	Private	Neptune Township

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 field collected by Remington & Vernick 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. The findings are summarized below and in Table 4, Figure 4, and Figure 5. Drainage area calculation methods are also described below.

Storm Drain Inlets

The Township of Neptune owns and operates 1578 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 Borough'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 the outfalls.

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 Borough'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.
- Interconnection drainage areas were determined by calculating and vectorizing the upslope areas of the categorized interconnections.

Figure 4: Outfall Drainage Area(s)

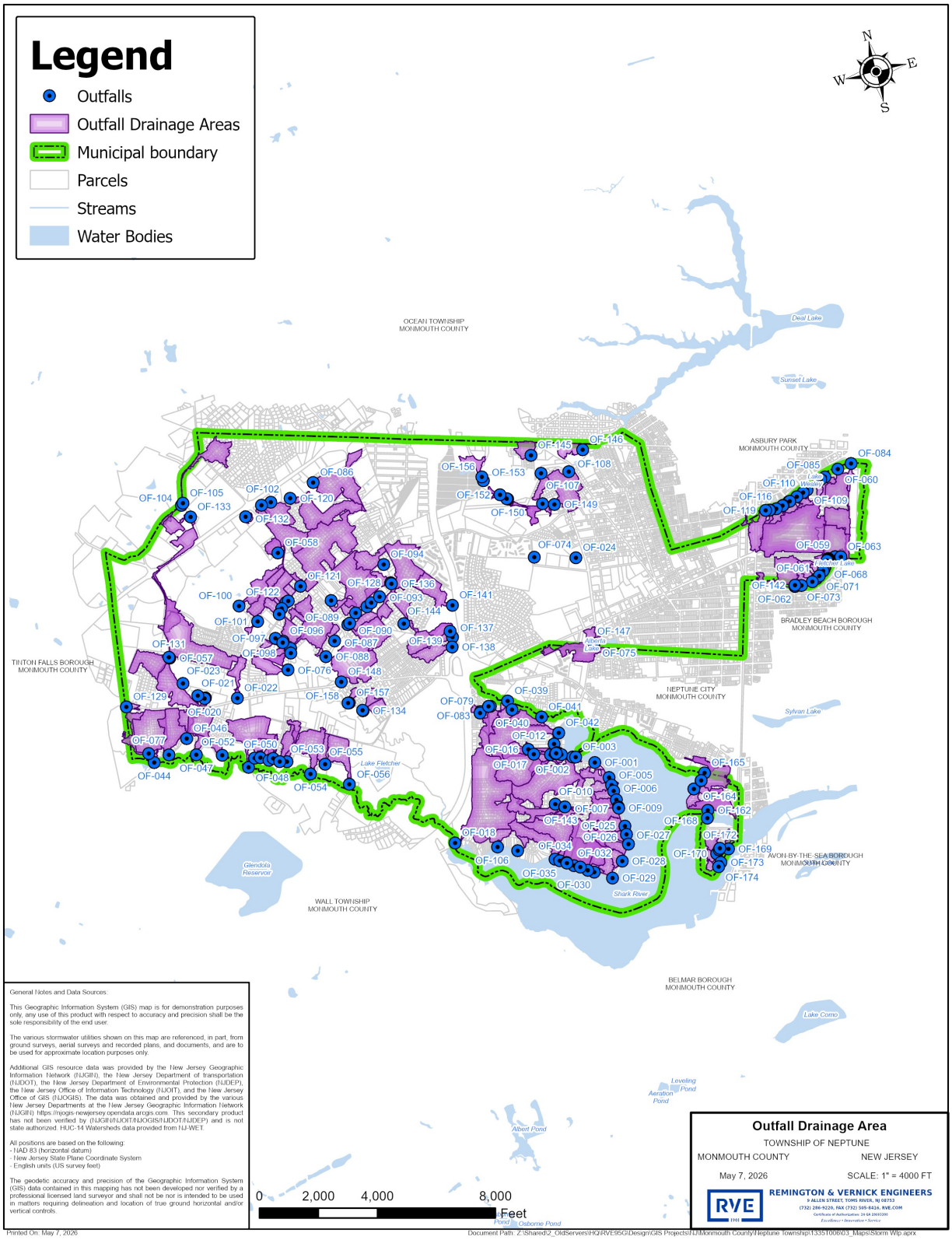


Figure 5: Interconnection Drainage Area(s)

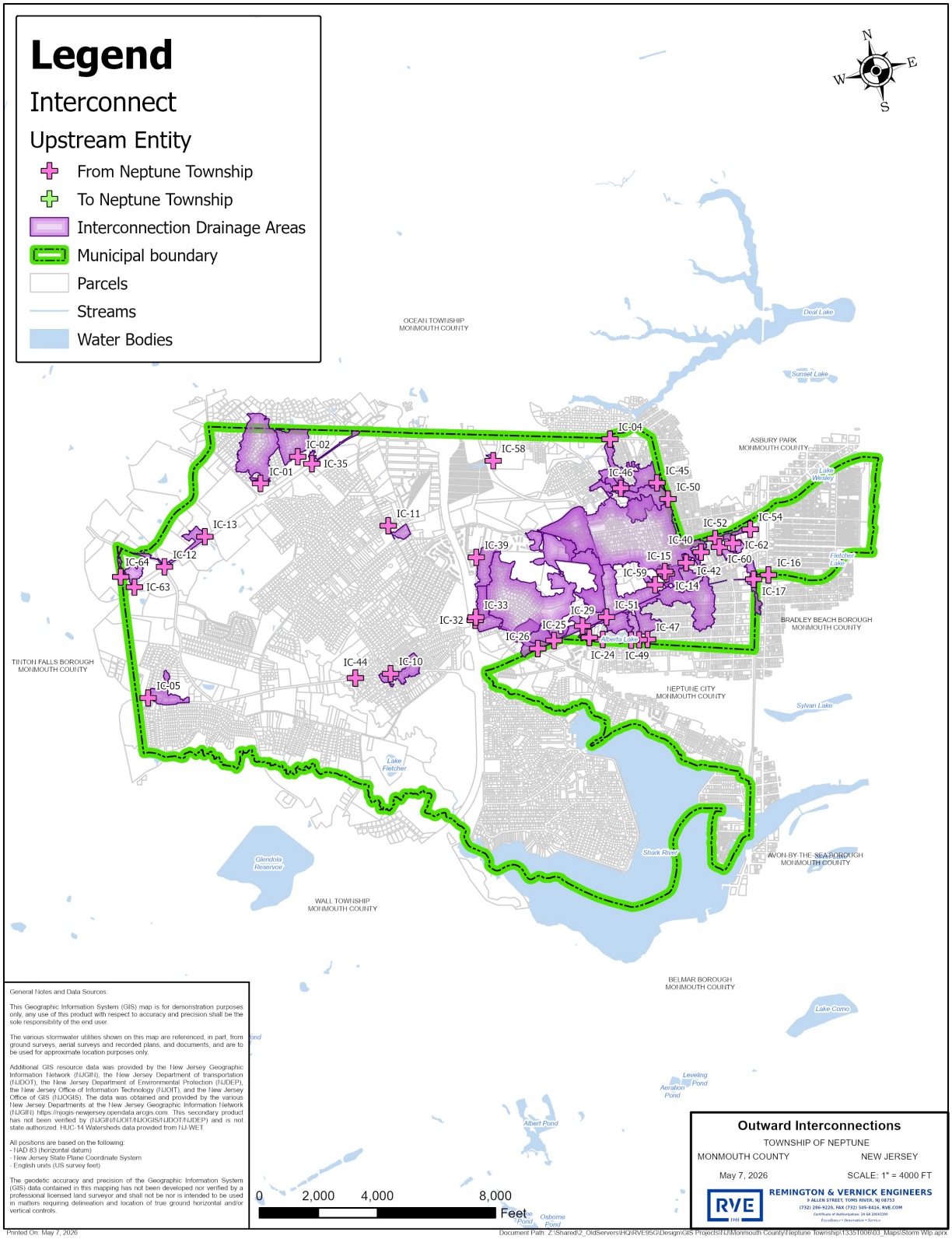


Table 4: Drainage Areas for Outfalls and Outward Interconnections

Drainage Area ID	Drainage Area (acres)	Outfall	Primary Contributing Drainage Area Type
OF-001	1.05	MS4 Outfall OF-001	Residential
OF-002	43.55	MS4 Outfall OF-002	Residential
OF-003	0.56	MS4 Outfall OF-003	Residential
OF-004	6.78	MS4 Outfall OF-004	Residential
OF-005	3.84	MS4 Outfall OF-005	Residential
OF-006	13.08	MS4 Outfall OF-006	Residential
OF-007	7.52	MS4 Outfall OF-007	Residential
OF-008	0.00	MS4 Outfall OF-008	Residential
OF-009	14.51	MS4 Outfall OF-009	Residential
OF-010	12.31	MS4 Outfall OF-010	Residential
OF-011	2.27	MS4 Outfall OF-011	Residential
OF-012	0.31	MS4 Outfall OF-012	Residential
OF-013	5.77	MS4 Outfall OF-013	Residential
OF-014	2.34	MS4 Outfall OF-014	Residential
OF-015	2.33	MS4 Outfall OF-015	Residential
OF-016	6.99	MS4 Outfall OF-016	Residential
OF-017	28.55	MS4 Outfall OF-017	Residential
OF-018	77.20	MS4 Outfall OF-018	Residential
OF-021	0.23	MS4 Outfall OF-021	Commercial
OF-023	20.94	MS4 Outfall OF-023	Residential
OF-024	0.06	MS4 Outfall OF-024	Commercial
OF-025	9.00	MS4 Outfall OF-025	Residential
OF-026	10.28	MS4 Outfall OF-026	Residential
OF-027	6.05	MS4 Outfall OF-027	Residential
OF-028	4.46	MS4 Outfall OF-028	Residential
OF-029	5.07	MS4 Outfall OF-029	Residential
OF-030	7.59	MS4 Outfall OF-030	Residential
OF-031	6.11	MS4 Outfall OF-031	Residential
OF-032	16.17	MS4 Outfall OF-032	Residential
OF-033	10.15	MS4 Outfall OF-033	Residential
OF-034	15.39	MS4 Outfall OF-034	Residential
OF-035	24.41	MS4 Outfall OF-035	Residential
OF-036	22.70	MS4 Outfall OF-036	Residential
OF-037	29.37	MS4 Outfall OF-037	Residential
OF-038	1.78	MS4 Outfall OF-038	Residential
OF-039	1.19	MS4 Outfall OF-039	Residential
OF-040	4.89	MS4 Outfall OF-040	Residential
OF-041	7.55	MS4 Outfall OF-041	Residential
OF-042	28.21	MS4 Outfall OF-042	Residential
OF-043	10.56	MS4 Outfall OF-043	Residential
OF-044	31.93	MS4 Outfall OF-044	Residential
Drainage Area ID	Drainage	Outfall	Primary Contributing

	Area (acres)		Drainage Area Type
OF-045	18.33	MS4 Outfall OF-045	Residential
OF-046	8.18	MS4 Outfall OF-046	Residential
OF-047	2.99	MS4 Outfall OF-047	Residential
OF-048	26.42	MS4 Outfall OF-048	Residential
OF-049	2.82	MS4 Outfall OF-049	Residential
OF-050	3.37	MS4 Outfall OF-050	Residential
OF-051	2.26	MS4 Outfall OF-051	Residential
OF-052	19.81	MS4 Outfall OF-052	Residential
OF-053	4.91	MS4 Outfall OF-053	Residential
OF-054	17.86	MS4 Outfall OF-054	Residential
OF-055	4.39	MS4 Outfall OF-055	Residential
OF-056	15.57	MS4 Outfall OF-056	Residential
OF-057	51.23	MS4 Outfall OF-057	Residential
OF-058	4.77	MS4 Outfall OF-058	Residential
OF-059	18.85	MS4 Outfall OF-059	Residential
OF-060	13.76	MS4 Outfall OF-060	Residential
OF-061	2.49	MS4 Outfall OF-061	Residential
OF-062	1.17	MS4 Outfall OF-062	Residential
OF-063	16.95	MS4 Outfall OF-063	Residential
OF-064	0.09	MS4 Outfall OF-064	Residential
OF-065	0.02	MS4 Outfall OF-065	Residential
OF-066	60.84	MS4 Outfall OF-066	Residential
OF-067	64.91	MS4 Outfall OF-067	Residential
OF-068	0.58	MS4 Outfall OF-068	Residential
OF-069	3.62	MS4 Outfall OF-069	Residential
OF-070	0.13	MS4 Outfall OF-070	Residential
OF-071	2.00	MS4 Outfall OF-071	Residential
OF-072	0.46	MS4 Outfall OF-072	Residential
OF-073	3.60	MS4 Outfall OF-073	Residential
OF-074	0.15	MS4 Outfall OF-074	Industrial
OF-075	15.69	MS4 Outfall OF-075	Commercial
OF-076	8.23	MS4 Outfall OF-076	Residential
OF-077	7.41	MS4 Outfall OF-077	Residential
OF-078	0.25	MS4 Outfall OF-078	Residential
OF-079	4.44	MS4 Outfall OF-079	Residential
OF-080	8.63	MS4 Outfall OF-080	Residential
OF-082	3.23	MS4 Outfall OF-082	Residential
OF-084	2.57	MS4 Outfall OF-084	Residential
OF-085	3.54	MS4 Outfall OF-085	Residential
OF-086	31.28	MS4 Outfall OF-086	Residential
OF-087	2.11	MS4 Outfall OF-087	Residential
OF-088	1.28	MS4 Outfall OF-088	Residential
Drainage Area ID	**Drainage**	**Outfall**	**Primary Contributing**

	Area (acres)		Drainage Area Type
OF-089	18.69	MS4 Outfall OF-089	Residential
OF-090	5.36	MS4 Outfall OF-090	Residential
OF-091	36.46	MS4 Outfall OF-091	Residential
OF-092	5.54	MS4 Outfall OF-092	Residential
OF-093	5.45	MS4 Outfall OF-093	Residential
OF-094	11.08	MS4 Outfall OF-094	Residential
OF-095	26.95	MS4 Outfall OF-095	Residential
OF-096	12.36	MS4 Outfall OF-096	Residential
OF-097	1.87	MS4 Outfall OF-097	Residential
OF-098	8.64	MS4 Outfall OF-098	Residential
OF-099	6.19	MS4 Outfall OF-099	Residential
OF-100	11.41	MS4 Outfall OF-100	Residential
OF-101	14.43	MS4 Outfall OF-101	Residential
OF-102	11.93	MS4 Outfall OF-102	Residential
OF-103	26.51	MS4 Outfall OF-103	Residential
OF-104	1.51	MS4 Outfall OF-104	Commercial
OF-105	14.41	MS4 Outfall OF-105	Residential
OF-106	5.20	MS4 Outfall OF-106	Residential
OF-107	5.05	MS4 Outfall OF-107	Residential
OF-108	23.54	MS4 Outfall OF-108	Residential
OF-109	0.28	MS4 Outfall OF-109	Residential
OF-110	2.58	MS4 Outfall OF-110	Residential
OF-111	0.39	MS4 Outfall OF-111	Residential
OF-112	2.36	MS4 Outfall OF-112	Residential
OF-113	0.03	MS4 Outfall OF-113	Residential
OF-114	0.37	MS4 Outfall OF-114	Residential
OF-115	0.36	MS4 Outfall OF-115	Residential
OF-116	2.88	MS4 Outfall OF-116	Residential
OF-117	1.18	MS4 Outfall OF-117	Residential
OF-118	1.21	MS4 Outfall OF-118	Residential
OF-119	12.37	MS4 Outfall OF-119	Residential
OF-120	26.72	MS4 Outfall OF-120	Residential
OF-121	59.15	MS4 Outfall OF-121	Residential
OF-122	9.65	MS4 Outfall OF-122	Residential
OF-123	2.56	MS4 Outfall OF-123	Residential
OF-124	0.85	MS4 Outfall OF-124	Residential
OF-125	4.10	MS4 Outfall OF-125	Residential
OF-126	4.38	MS4 Outfall OF-126	Residential
OF-127	0.38	MS4 Outfall OF-127	Residential
OF-128	3.81	MS4 Outfall OF-128	Residential
OF-129	1.50	MS4 Outfall OF-129	Residential
OF-130	11.37	MS4 Outfall OF-130	Residential
Drainage Area ID	**Drainage**	**Outfall**	**Primary Contributing**

	Area (acres)		Drainage Area Type
OF-131	15.87	MS4 Outfall OF-131	Residential
OF-132	1.28	MS4 Outfall OF-132	Residential
OF-133	17.47	MS4 Outfall OF-133	Commercial
OF-134	4.13	MS4 Outfall OF-134	Residential
OF-135	4.82	MS4 Outfall OF-135	Residential
OF-136	29.22	MS4 Outfall OF-136	Residential
OF-137	19.02	MS4 Outfall OF-137	Residential
OF-138	9.95	MS4 Outfall OF-138	Residential
OF-139	5.13	MS4 Outfall OF-139	Residential
OF-140	3.01	MS4 Outfall OF-140	Residential
OF-141	14.62	MS4 Outfall OF-141	Residential
OF-142	19.02	MS4 Outfall OF-142	Residential
OF-143	3.57	MS4 Outfall OF-143	Residential
OF-144	8.25	MS4 Outfall OF-144	Residential
OF-145	7.05	MS4 Outfall OF-145	Residential
OF-147	20.49	MS4 Outfall OF-147	Commercial
OF-148	34.71	MS4 Outfall OF-148	Residential
OF-149	6.26	MS4 Outfall OF-149	Commercial
OF-150	0.98	MS4 Outfall OF-150	Park/Open Space
OF-151	2.59	MS4 Outfall OF-151	Park/Open Space
OF-152	2.59	MS4 Outfall OF-152	Park/Open Space
OF-153	0.07	MS4 Outfall OF-153	Park/Open Space
OF-154	2.24	MS4 Outfall OF-154	Residential
OF-155	4.50	MS4 Outfall OF-155	Commercial
OF-156	5.59	MS4 Outfall OF-156	Commercial
OF-157	0.00	MS4 Outfall OF-157	Residential
OF-158	2.47	MS4 Outfall OF-158	Residential
OF-161	8.30	MS4 Outfall OF-161	Residential
OF-162	13.49	MS4 Outfall OF-162	Commercial
OF-163	11.41	MS4 Outfall OF-163	Commercial
OF-164	7.67	MS4 Outfall OF-164	Residential
OF-165	5.83	MS4 Outfall OF-165	Residential
OF-166	5.95	MS4 Outfall OF-166	Residential
OF-167	19.02	MS4 Outfall OF-167	Residential
OF-168	0.37	MS4 Outfall OF-168	Residential
OF-169	1.31	MS4 Outfall OF-169	Residential
OF-170	2.18	MS4 Outfall OF-170	Residential
OF-171	0.42	MS4 Outfall OF-171	Residential
OF-172	7.40	MS4 Outfall OF-172	Residential
OF-173	0.50	MS4 Outfall OF-173	Residential
OF-174	1.90	MS4 Outfall OF-174	Residential

Drainage Area ID	Drainage Area (acres)	Interconnection	Primary Contributing Drainage Area Type
IC-01	49.88	Interconnection to State MS4	Residential
IC-02	21.01	Interconnection to State MS4	Residential
IC-04	11.15	Interconnection to County MS4	Residential
IC-05	12.32	Interconnection to State MS4	Residential
IC-10	13.65	Interconnection to State MS4	Residential
IC-11	4.15	Interconnection to County MS4	Residential
IC-12	1.93	Interconnection to State MS4	Commercial
IC-13	7.53	Interconnection to State MS4	Commercial
IC-14	4.76	Interconnection to State MS4	Commercial
IC-15	0.01	Interconnection to State MS4	Commercial
IC-17	8.01	Interconnection to County MS4	Commercial
IC-24	0.58	Interconnection to County MS4	Commercial
IC-25	17.48	Interconnection to State MS4	Residential
IC-26	2.23	Interconnection to State MS4	Residential
IC-29	147.91	Interconnection to State MS4	Residential
IC-31	1.50	Interconnection to County MS4	Commercial
IC-32	15.95	Interconnection to State MS4	Residential
IC-33	8.52	Interconnection to State MS4	Residential
IC-35	4.14	Interconnection to State MS4	Commercial
IC-39	15.36	Interconnection to Private MS4	Residential
IC-40	2.65	Interconnection to Private MS4	Residential
IC-42	16.99	Interconnection to Private MS4	Residential
IC-45	24.82	Interconnection to County MS4	Residential
IC-46	2.45	Interconnection to County MS4	Residential
IC-47	11.03	Interconnection to County MS4	Residential
IC-48	5.66	Interconnection to County MS4	Residential
IC-49	12.01	Interconnection to County MS4	Residential
IC-50	25.74	Interconnection to Asbury Park MS4	Residential
IC-52	0.29	Interconnection to County MS4	Residential
IC-54	196.97	Interconnection to County MS4	Residential
IC-58	0.69	Interconnection to Private MS4	Commercial
IC-59	99.61	Interconnection to Private MS4	Commercial
IC-60	3.04	Interconnection to County MS4	Residential
IC-62	3.44	Interconnection to Private MS4	Residential
IC-63	5.89	Interconnection to State MS4	Residential
IC-64	1.53	Interconnection to Private MS4	Residential

TMDLs and Water Quality Impairments

In accordance with Section 305(b) and 303(d) of the Federal Clean Water Act, 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 (TMDLs) may be necessary. NJDEP fulfills its assessment obligation under the Clean Water Act through the Integrated Water Quality Monitoring and Assessment Report (i.e., Integrated Report), which includes the Integrated List of Waterbodies, issued biennially. A TMDL represents the assimilative or carrying capacity of a waterbody, taking into consideration point and nonpoint sources of pollutants of concern, the natural background, and surface water withdrawals. A TMDL can be thought of as a "budget" for the total amount of a pollutant that can enter a waterbody while still maintaining surface water quality standards. TMDLs have been developed for various pollutants in various waterbodies throughout the state. Tier A MS4 discharges are considered point sources under the Clean Water Act;

Surface water quality problems in Neptune Township, New Jersey, are primarily linked to **stormwater runoff**, which carries pollutants like bacteria, fertilizers, and oil from urban and suburban areas into local waterways. Other issues include potential contamination from aging septic systems, flooding due to coastal location and heavy rainfall, and overall susceptibility to pathogens.

Issues affecting Neptune Township Stormwater Water Quality

- **Stormwater Runoff**: Runoff from streets, lawns, and other impervious surfaces is a major source of pollution. It can contain bacteria, chemicals (like fertilizers and pesticides), and debris that enter the storm drains and eventually flow into rivers and the ocean without treatment.
- **Pathogens:** Rain events can significantly increase bacteria levels in streams and wetlands, particularly from sources like pet waste, wildlife, and leaking septic systems.
- **Septic Systems:** While public sewer systems are in place, some areas still rely on septic systems. A malfunctioning system can leak and contaminate groundwater, which can then impact nearby surface water.
- **Flooding:** Due to its coastal location, the township experiences frequent flooding during storms and tidal surges. This can exacerbate water quality issues by washing pollutants from land into waterways and can sometimes lead to the failure of drainage infrastructure.
- **Vulnerability to pathogens:** The New Jersey Department of Environmental Protection (NJDEP) has rated all surface water intakes in the area as highly susceptible to pathogens, although this reflects the potential for contamination, not necessarily the presence of it. Public water systems are required to monitor and treat water to ensure it remains safe.

Table(s) #: TMDLs and Impairments for Subwatersheds within or bordering (Neptune Township)

HUC 14	Subwatershed Name	TMDL(s)	Impairment(s)
02030104090050	*Jumping Brook*	*Stream sheds Fecal Coliform (2004)*	*None*
02030104090060	*Shark River*	*Stream sheds Fecal Coliform (2004), Total Phosphorous (2005), Mercury (2011)*	*Dissolved Oxygen, PCBs in Fish Tissue Impaired*
02030104090040	*Shark River (above Remsen Mill gage)*	*Stream sheds Mercury (2011)*	*PCB in Fish Tissue*
02030104090090	*Deal Lake*	*Stream sheds Mercury (2010)*	*E Coli*
02030104090090	*Deal Lake*	*Lakebeds Fecal Coliforms (2007) Total Phosphorous (2003)*	*E. Coli*
02030104090060	*Shark River*	*Shellfish Total Coliforms (2006)*	*Dissolved Oxygen, PCBs in Fish Tissue Impaired*

Dissolved oxygen (DO) refers to the concentration of oxygen gas incorporated into the water. Oxygen enters the water by direct absorption from the atmosphere and is enhanced by turbulence. Running water, such as that of a swift moving stream, normally contains more dissolved oxygen than the still water of a pond or lake. Water also absorbs oxygen released by aquatic plants during photosynthesis. Sufficient DO is essential to growth and reproduction of aerobic aquatic life (e.g., see Murphy 2006, Giller and Malmqvist 1998, Allan 1995; https://www.epa.gov/caddis-vol2/dissolved-oxygen). Low levels of oxygen (hypoxia) or no oxygen levels (anoxia) can occur when excess organic materials are decomposed by microorganisms. During this decomposition process, the DO in the water is consumed. In some water bodies, DO levels fluctuate periodically, seasonally, and even as part of the natural daily ecology of the aquatic resource. As DO levels drop, some sensitive animals may move away, decline in health, or even die.

DO is considered an important measure of water quality as it is a direct indicator of an aquatic resource's ability to support aquatic life. While each organism has its own DO tolerance range, generally, DO levels below 3 milligrams per liter (mg/L) are of concern and waters with levels below 1 mg/L are considered hypoxic and are usually devoid of life. Stormwater runoff containing nutrients such as nitrate, phosphorus, and organic TSS matter and animal and pet waste cause the levels of dissolved oxygen to decrease in the receiving waters. An increase in these materials transported via stormwater runoff will have a greater impact on receiving waters.

Pathogens, including fecal coliform, and total coliform, enter the receiving waters 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).

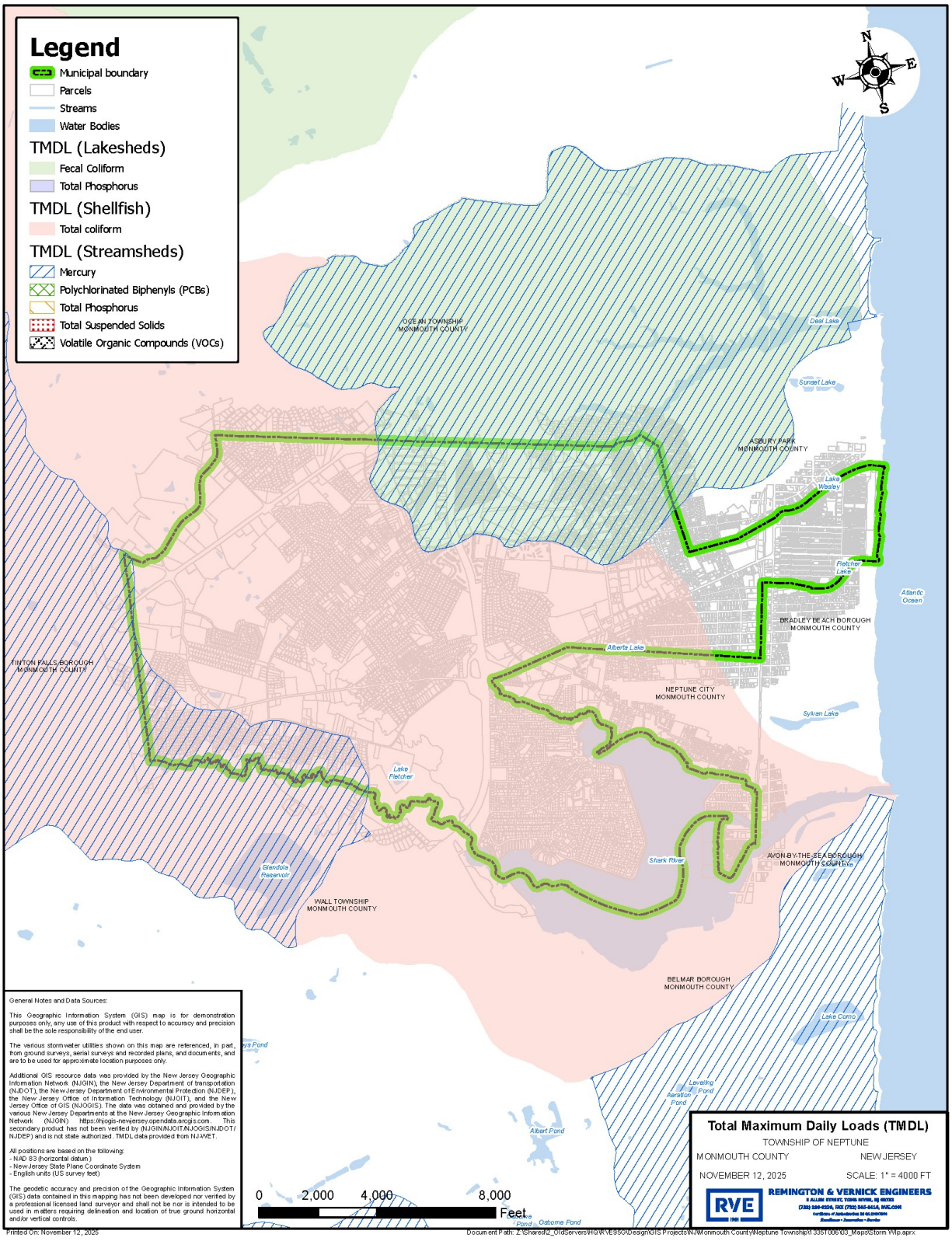
While sewage treatment plants contribute a steady input of treated sewage to their receiving waters, stormwater runoff is the primary contributor to pathogen loads in the surface waters of the state. Many of these pathogens affect the designated uses of the receiving waters and are harmful to human or animal health when ingested causing intestinal disease. Pathogens can attack the immune system and cause infections that may result in abdominal issues, respiratory problems, fever, headache, skin rashes, etc. (Water Quality Topics: Pathogens | US EPA).

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.

Phosphorus is a key nutrient for plant growth and is often the limiting nutrient in a freshwater setting. Total phosphorous is the sum of particulate and dissolved phosphorous which includes the total amount of phosphorous in both organic and inorganic forms. High concentrations of phosphorus in receiving waters may result from stormwater runoff due to poor agricultural practices, urban areas, leaking septic systems, illicit discharges or SSOs. Additional stormwater runoff sources of phosphorous include the breakdown of plant and leaf litter (including grass clippings), soil particles, pet and animal waste, fertilizer from lawns, and atmospheric deposition of phosphorus particles. Contribution from runoff from lawns and roads accounts for the greatest loading in many receiving waters.

An excess of phosphorus into a water body can have a detrimental effect on designated uses related to both public health and aquatic health. For instance, too much phosphorus in a surface water can cause increased growth of algae and large aquatic plants (a process called eutrophication) causing significant swings in pH and dissolved oxygen, which can in turn result in the violation of surface water quality criteria for these parameters and adversely affect the aquatic community. Additionally, high levels of phosphorus can also lead to HABs, that produce toxins which can be harmful to human and animal health. The presence of excessive plant biomass can also interfere with other designated uses, such as swimming or boating. When algae are present in large amounts, drinking water purveyors must also increase the use of disinfectants and oxidants to treat the algae, which can lead to an increase in disinfection byproducts such as trihalomethanes, listed as likely carcinogens by EPA.

Figure 6: TMDLs within the Permittee's MS4



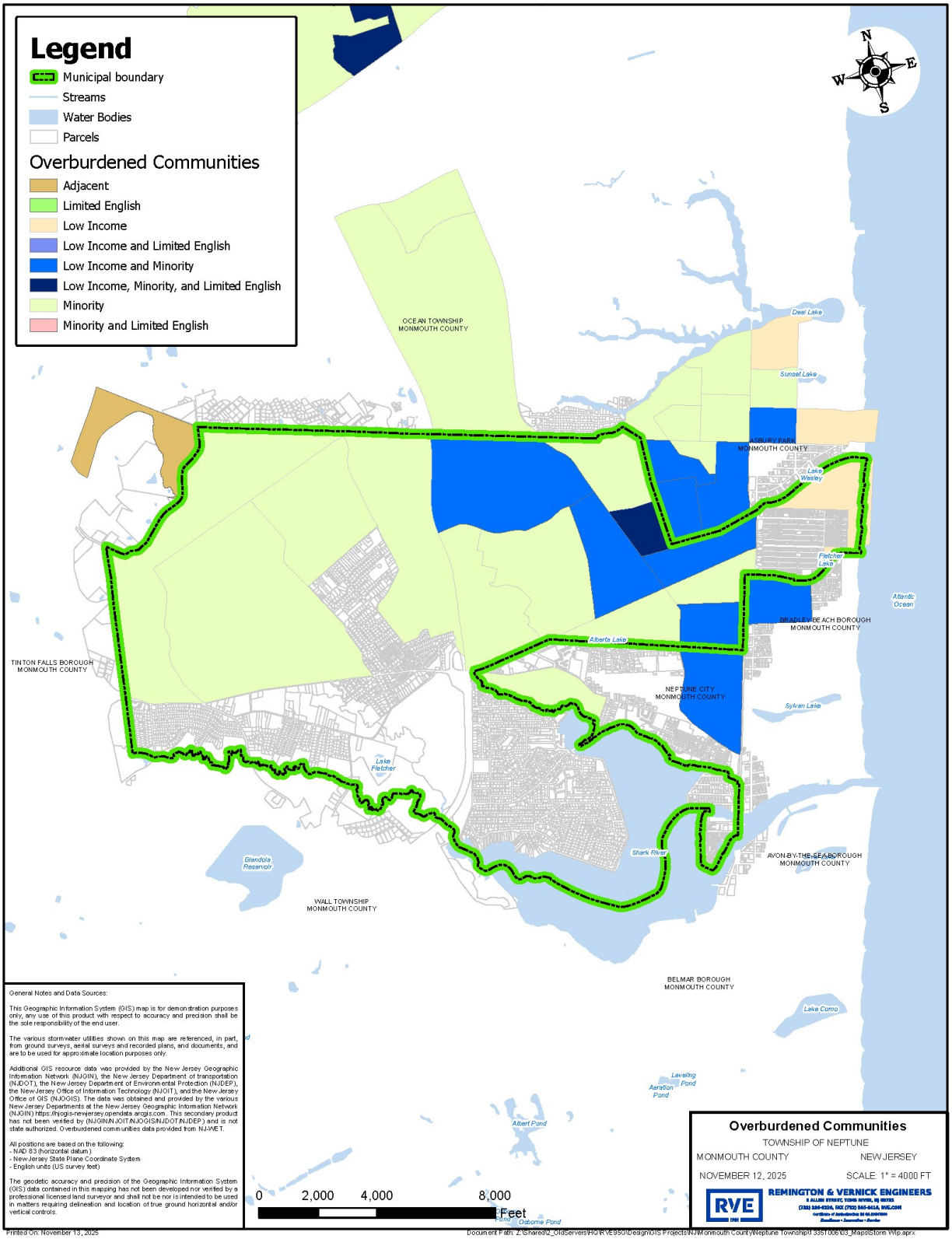
Overburdened Communities

Overburdened communities with limited financial resources have less capacity to invest in adequate stormwater management systems, increasing the vulnerability of the community to flooding. Flooding in overburdened communities can also lead to public health issues since these communities are already more susceptible to health disparities. This dataset was extracted from NJDEP's GIS Open Data source in November, 2025.

Overburdened communities' data by subwatershed is summarized below:

HUC-14	Watershed	Watershed Pop. Poverty	% of Low Income
02030104090050	Jumping Brook (Ocean Co)	1954	6.75%
02030104090060	Shark River (below Remsen Mill gage)	1025	26.6%
02030104090030	Deal Lake	2272	18.9%
02030104090090	Atl drainage (Shark R - Deal Lk)	1126	39.1%
02030104930010	Atlantic Coast (Whale Pond to Shark R)	846	40.4%
02030104090020	Poplar Brook	1447	23.9%

Figure 7: Overburdened Communities within the Township of Neptune



Impervious Area

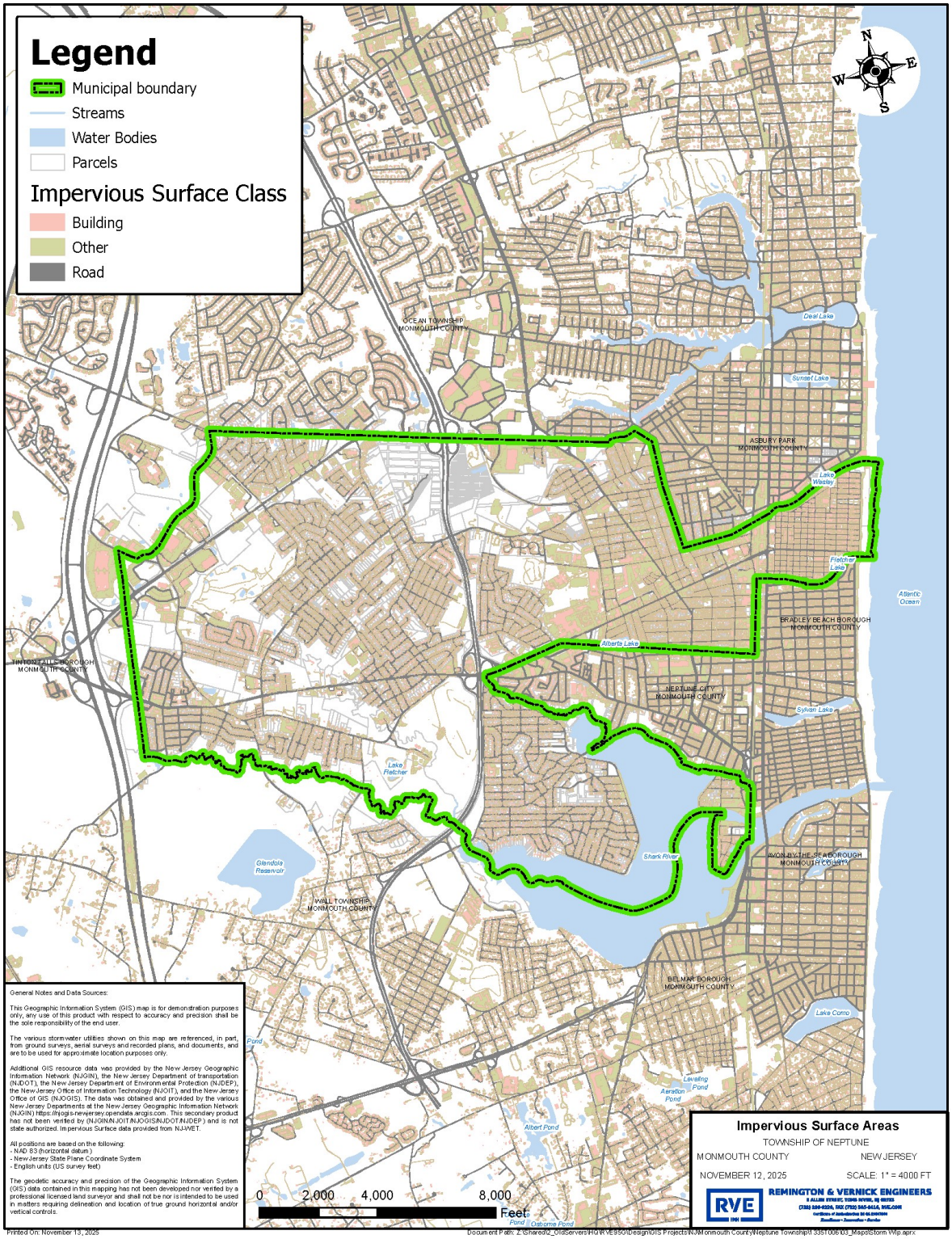
NJDEP's Open Data impervious surface GIS data layer depicts surfaces throughout Neptune Township that have been covered with materials that are highly resistant to infiltration by water, rendering them impervious. These impervious cover values were used to estimate the impervious coverage for Neptune Township. NJWET data was used in November, 2025 to obtain data for Neptune Township.

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.

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

HUC14	Subwatershed Name	HUC14 Acres	class	Imervious Acres	HUC14 % Impervious
02030104090030	Deal Lake	748.86269	**Overall**	**256.15**	**34.21%**
			Building	51.20	6.84%
			Other	117.67	15.71%
			Road	87.28	11.66%
02030104090040	Shark River (above Remsen Mill gage)	334.07024	**Overall**	**125.74**	**37.64%**
			Building	29.95	8.97%
			Other	51.58	15.44%
			Road	44.21	13.23%
02030104090050	Jumping Brook (Ocean Co)	2051.53	**Overall**	**673.89**	**32.85%**
			Building	153.69	7.49%
			Other	283.59	13.82%
			Road	236.62	11.53%
02030104090060	Shark River (below Remsen Mill gage)	1482.7889	**Overall**	**411.09**	**27.72%**
			Building	97.33	6.56%
			Other	137.45	9.27%
			Road	176.31	11.89%
02030104090090	Atl drainage (Shark R - Deal Lk)	1000.3761	**Overall**	**681.11**	**68.09%**
			Building	191.54	19.15%
			Other	300.40	30.03%
			Road	189.17	18.91%

Figure 8: Impervious Area within the Township of Neptune



Non-Municipally Owned or Operated Stormwater Facilities

There are 57 known stormwater facilities within the Township of Neptune that are not municipally owned. They are summarized in the table and Figure 9 below.

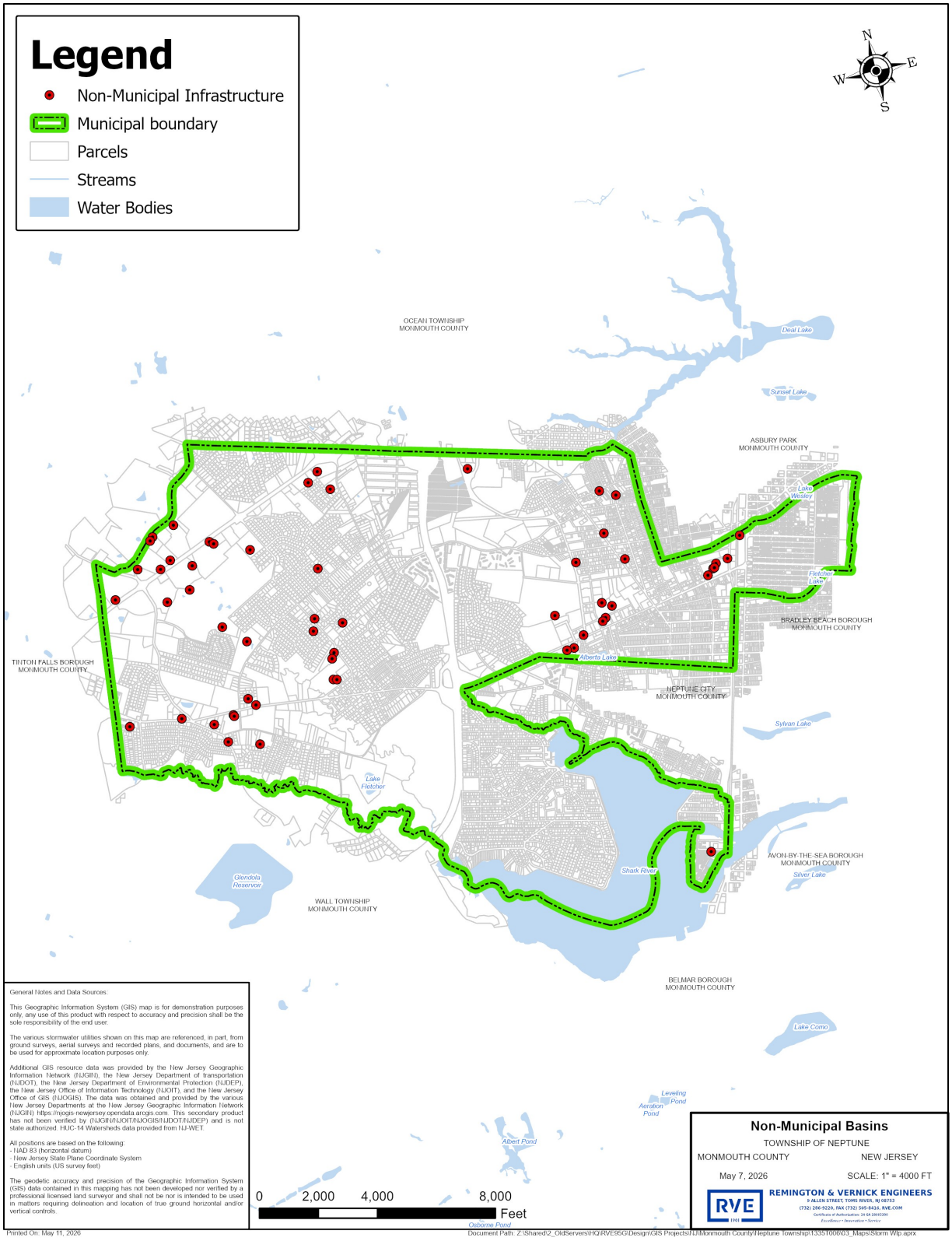
Table 7: Non-Municipally Owned or Operated Stormwater Facilities within the Township of Neptune

Basin ID	Project Name	HUC14	Project Block	Project Lot	Basin Type
102212	Heritage Estates III	02030104090050	8000	19 & 21	Detention
108733	Summerfield Estates	02030104090030	189	15, 16, 81-91	Detention
101157	Channel Modifications	02030104090050	10015	9,9.01,10,10.01	Detention
113504	Midtown Senior Apartments	02030104090030	189	10	Detention
100781	Athletilc Field Improvements-Memorial Complex	02030104090050	344	56	Infiltration \ Detention
111296	Neptune Park For Industry	02030104090050	10017	5	Detention
110605	Asbury Park Press Inc	02030104090050	1508	3	Infiltration
110122	Neptune Summerfield Elementary School	02030104090050	344	56, 57	Infiltration
111556	Neptune Summerfield Elementary School	02030104090050	344	56, 57	Infiltration
108787	Additions to Greengrove Elementary School	02030104090050	1000	6.01	Infiltration \ Detention
110308	United Stor All	02030104090030	1007.01	77 & 78	Detention
104794	Compass Pointe	02030104090060	563	3	Detention
111715	Neptune Social Security Building	02030104090050	9025	52.01	Detention
107553	Residence Inn	02030104090050	10000	7.02	Detention
106971	Early Childhood Center	02030104090090	155	14.01	Detention
101915	Heritage Estates II	02030104090050	9002	9,26	Retention \ Wet Pond
109540	GM Coastal Properties	02030104090040	1405	12,14,15	Infiltration
109450	Midtown Senior Apartments	02030104090030	189	10	Detention
105298	Quick Chek Food Store	02030104090050	1200	12	Detention

Basin ID	Project Name	HUC14	Project Block	Project Lot	Basin Type
110467	Green Grove	02030104090050	8000	20	Detention
101149	Community School	02030104090090	155	13.01	Infiltration
103796	Community School	02030104090090	155	13.01	Infiltration
110722	Community School	02030104090090	155	13.01	Infiltration
112895	Community School	02030104090090	155	13.01	Infiltration
109131	Maggio professional Bldg	02030104090050	10015	4	Detention
103697	Auto Zone Neptune	02030104090030	225.03	28	Infiltration \ Detention
113564	Landmark Place Subdivision	02030104090040	6006	1	Infiltration
108250	Foodbank of Monmouth Ocean Counties	02030104090050	9025	51	Detention
107602	Warehouse	02030104090090	267.05/266/271	1/2/3/33/1	Detention
110549	Warehouse	02030104090090	267.05/266/271	1/2/3/33/1	Detention
102020	West Grove Square	02030104090090	151	2 & 29	Detention
101424	walgreens	02030104090090	283.01	6-Jan	Infiltration
110594	The Home Depot	02030104090050	10000	7.01, 23, 24, 7	Detention
113278	The Home Depot	02030104090050	10000	7.01, 23, 24, 7	Detention
106452	Child care facility	02030104090090	3000	1,4,8	Detention
105055	MON-OC Credit Union	02030104090050	9025	50	Detention
102149	Summerfield	02030104090050	7006	2	Infiltration
101135	Wells Brook Apartments	02030104090050	10015	9	Detention
103638	Walmart	02030104090050	10017	1,13,19,20	Infiltration
104674	Walmart	02030104090050	10017	1,13,19,20	Infiltration
106416	Walmart	02030104090050	10017	1,13,19,20	Infiltration
109337	Walmart	02030104090050	10017	1,13,19,20	Detention
110030	Walmart	02030104090050	10017	1,13,19,20	Detention
106777	Woodlands at Neptune	02030104090050	10000	9.01	Detention
114937	DJS Management Offices	02030104090030	263	41, 42, 43, 44, 45, 73, 74	Infiltration
115040	jumping brook cc	02030104090050	10000	7	Detention
115043	abbas family trust	02030104090090	218.01	652	Infiltration
115047	quick chek	02030104090090	3102	1	Detention
117597	JCFL Properties	02030104090040	6006	9	Infiltration
117656	Temporary Contractor Parking	02030104090090	3102	1-9,14-20	Infiltration \ Detention
118089	Wawa Rt. 66 Neptune	02030104090050	48.02,10000	27,28	Detention

Basin ID	Project Name	HUC14	Project Block	Project Lot	Basin Type
118090	Wawa Rt. 66 Neptune	02030104090050	48.02,10000	27,28	Detention
118152	MEDICAL OFFICE - NEPTUNE	02030104090050	7019	7	Detention
118153	MEDICAL OFFICE - NEPTUNE	02030104090050	7019	7	Detention
118167	NEPTUNE TOWNSHIP SENIOR CENTER	02030104090090	272	8	Infiltration
118168	NEPTUNE TOWNSHIP SENIOR CENTER	02030104090090	272	8	Infiltration \ Detention
118174	TEAM AND CONCESSION STAND	02030104090050	344	56	Infiltration

Figure 9: Non-Municipal Stormwater Infrastructure within the Township of Neptune



Conclusion

This Watershed Inventory Report shall serve as a record of the known stormwater infrastructure, water quality data, and additional relevant information within Neptune Township. All the datasets contained in this report have been compiled into a GIS digital map that can be utilized to look at the data in far more detail than the static maps included will provide. This report will be followed by a Watershed Assessment Report, which will provide an assessment of potential water quality improvement projects that can be done to address water quality issues that have been identified in this report.

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NJDEP ***Pollutants of Concern*** document, not dated.

Report entitled "Hamilton Township (Mercer County) Watershed Inventory Report", developed by the Rutgers Cooperative Extension Water Resources Program, dated January 31, 2024