Watershed Inventory Report

Phase 1 of the Watershed Improvement Plan

Oxford Township
Warren County

NJPDES Permit Number: NJG0151904

DRAFT: March 3, 2026

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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 (*regulatory citations are included at the end of each definition for those that are copied from that regulation)
   - 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. (see 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 ocean 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).*

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Acknowledgements

For Phase 1 of the Watershed Improvement Plan (WIP), the Oxford Township Watershed Inventory Report has been prepared by UTRS Civil & Environmental Engineering (UTRSCEE). The WIP is a plan required from every permittee of the NJDEP Tier A MS4 Permit; and is intended to identify opportunities to improve water quality, reduce MS4 contribution of pollutants to waterbodies with impairments and TMDLs, and address stormwater flooding to protect human health and safety along with the environment. Since 2023, Oxford Township has been reassigned from being a Tier B municipality to a Tier A municipality under NJDEP's MS4 permit program.

The following individual of UTRSCEE who have contributed to this report include:

- Donna M. Becker, P.E., Oxford Township Engineer, Stormwater Program Coordinator

This report draws upon resources including field observations and NJDEP datasets inclusive of GIS mapping. The following resources utilized for this report include but are not limited to the following:

- New Jersey Watershed Evaluation Tool (NJ-WET)
- NJGIN Open Data Portal
- MS4 WIP Guidance Webpage
- TMDL Lookup Tool
- New Jersey's Integrated Water Quality Assessment Reports (303(d) List)
- New Jersey Environmental Justice Mapping, Assessment, and Protection Tool (EJMAP)
- New Jersey Hydrologic Modeling Database ("H&H Database")

A detailed list of all references as well as links to the resources listed above are available in the References section at the end of this report.

Regional Collaboration

As of January 1, 2026, regional collaboration efforts with other MS4 permittees, environmental groups, or watershed groups involving Oxford Township as the MS4 permittee have not occurred for Phase 1 of the WIP. Future collaboration for Phases 2 and 3 of the WIP is not anticipated at this time. In the event a regional approach to the WIP is proposed, the Stormwater Program Coordinator will contact MS4 County Case Manager Hannah Maugeri and coordinate with adjacent municipalities within the Pequest River (Below Bear Swamp) watershed, Pophandusing Brook/Buckhorn Creek watershed, and Pohatcong Creek watershed. UTRSCEE will facilitate data sharing with the NJ Highlands Council and Warren County Planning Department.

Introduction

Location

Oxford Township is a municipality in northwestern New Jersey within Warren County, covering approximately 6.06 square miles in total. The Township is fully within the NJ Highlands. See Figure 1 below for a map of Oxford Township depicting the center of the Township being within the Highlands Planning Area, and the rest of the Township being within the Highlands Preservation Area.

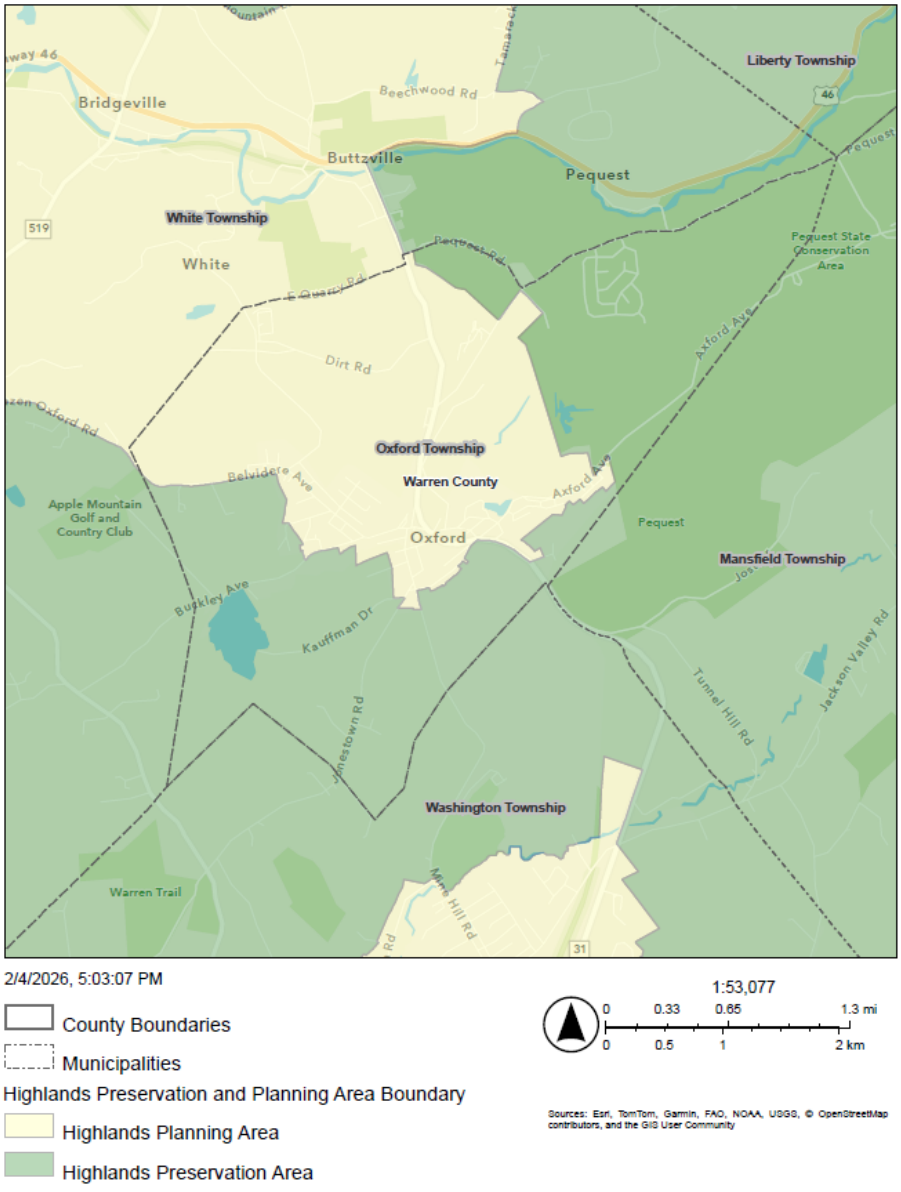

Figure 1 – Oxford Township Map

Population and Demographics

According to the 2020 U.S. Census, Oxford Township's population is approximately 2,444 residents. There are approximately 1,062 households in the Township, where the median yearly household income is $102,600. The median age in the Township is 45 years old, with approximately 16.5% of residents being 65+ years old. The overall poverty rate within the Township is 4.8% and 23.9% of residents 25+ years old have a bachelor's degree or higher.

Land Use

The NJDEP Land Use/Land Cover (2015 update) of the Township consists of the following and is depicted in Figure 2 (from Reference #12) below:

- Forest – 45.1%
- Wetlands – 20.5%
- Urban – 17.8%
- Agriculture – 13.2%
- Water – 1.9%
- Barren Land – 1.5%

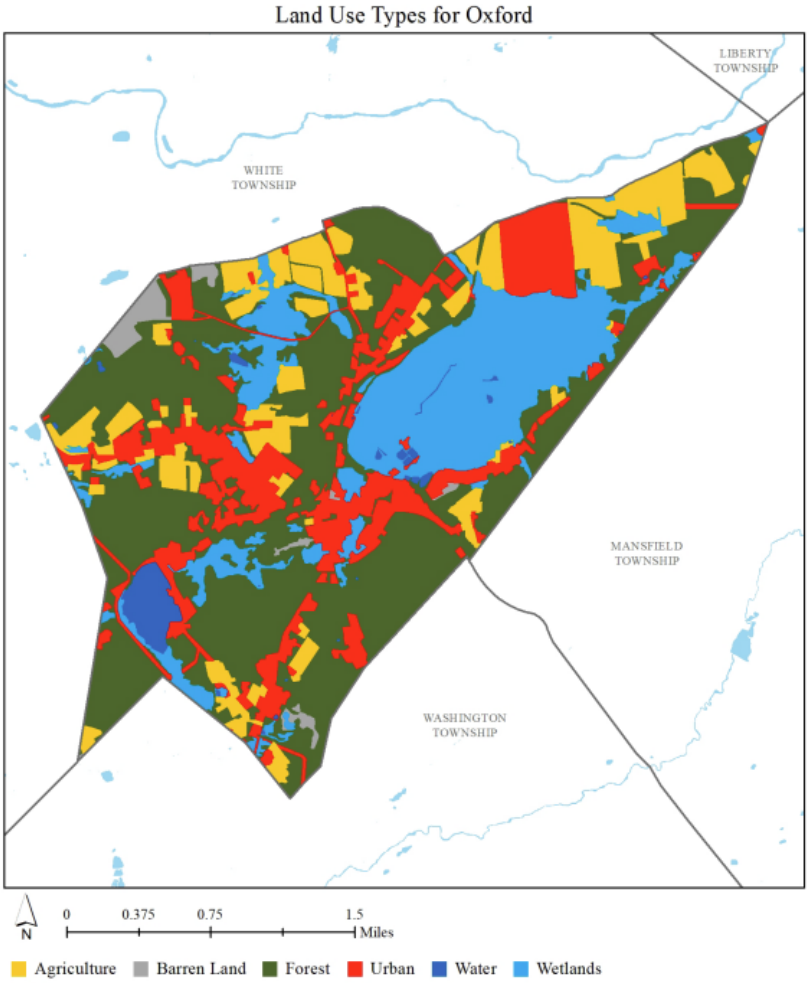

Figure 2 – Land Use Types in Oxford Township

The following pie chart in Figure 3 (from Reference #12) below depicts the distribution of land use out of the urban land cover within Oxford Township. Over half of the urban land cover consists of low and medium density residential uses.

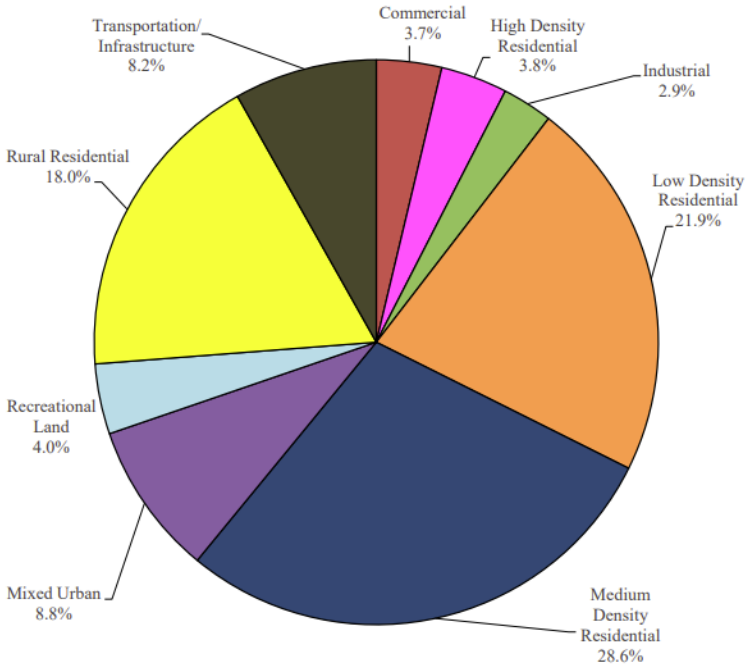

Figure 3 – Urban Land Use in Oxford Township

Subwatersheds (HUC-14) within or bordering Oxford Township

Oxford Township sits entirely within the Upper Delaware Watershed Management Area (WMA No. 1), and much of the Township is within the Pequest River (Below Bear Swamp) watershed. The exception is the westernmost portion of the Township being within the Pophandusing Brook/Buckhorn Creek watershed, and the southern tip of the Township being within the Pohatcong Creek watershed. The New Jersey Water Evaluation Tool (NJ-WET) has identified the following subwatersheds within the Township, as depicted in Table 1 below and Figure 4 (from Reference #12) below. These subwatersheds are all part of Water Region No. 4 (Northwest).

Subwatershed Name	HUC-14
Pophandusing Brook	02040105110010
Furnace Brook	02040105090050
Pequest River (Below Furnace Brook)	02040105090060
Pequest River (Furnace Brook to Cemetary Rd)	02040105090030
Pohatcong Creek (Brass Castle Creek to Route 31)	02040105140020

Table 1 – Subwatersheds of Oxford Township

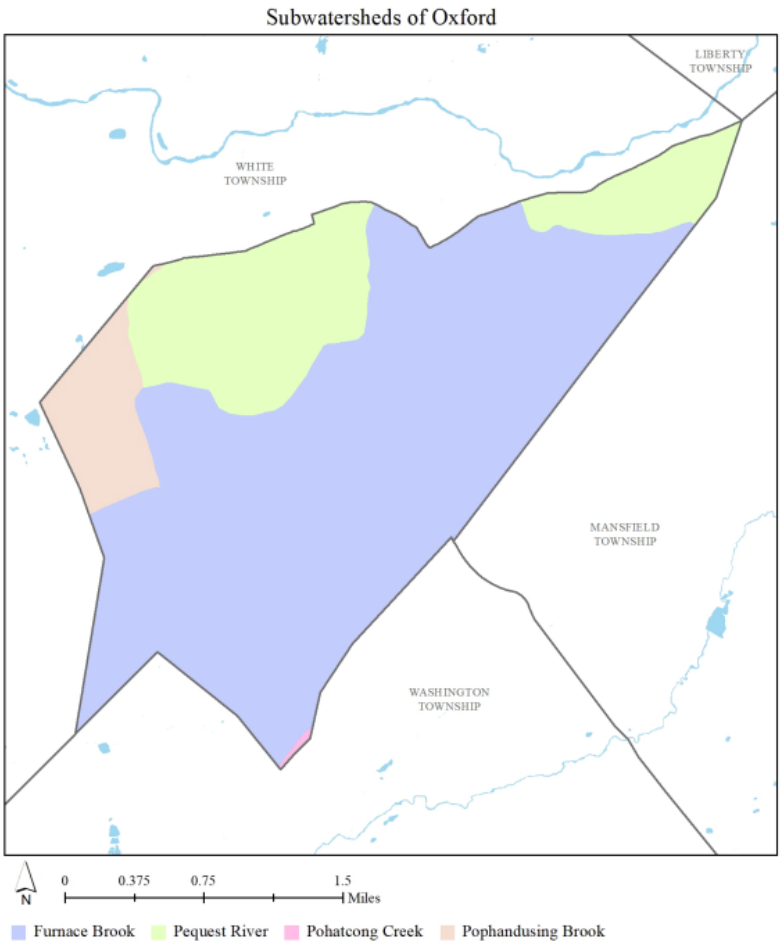

Figure 4 – Subwatersheds within Oxford Township

Flood-Prone Areas

FEMA Mapping indicates flood-prone areas of Oxford Township are present in the vicinity of Furnace Lake, Furnace Brook, and the unnamed Tributaries of Furnace Brook. Additionally, several stormwater inlets and outfalls along Belvidere Avenue and Washington Avenue within the Township experience periodic surcharge. The figure below identifies a snapshot of FEMA Firm Panels No. 34041C0236E and 34041C0220E showing flood-prone areas along Furnace Brook near the center of the Township.

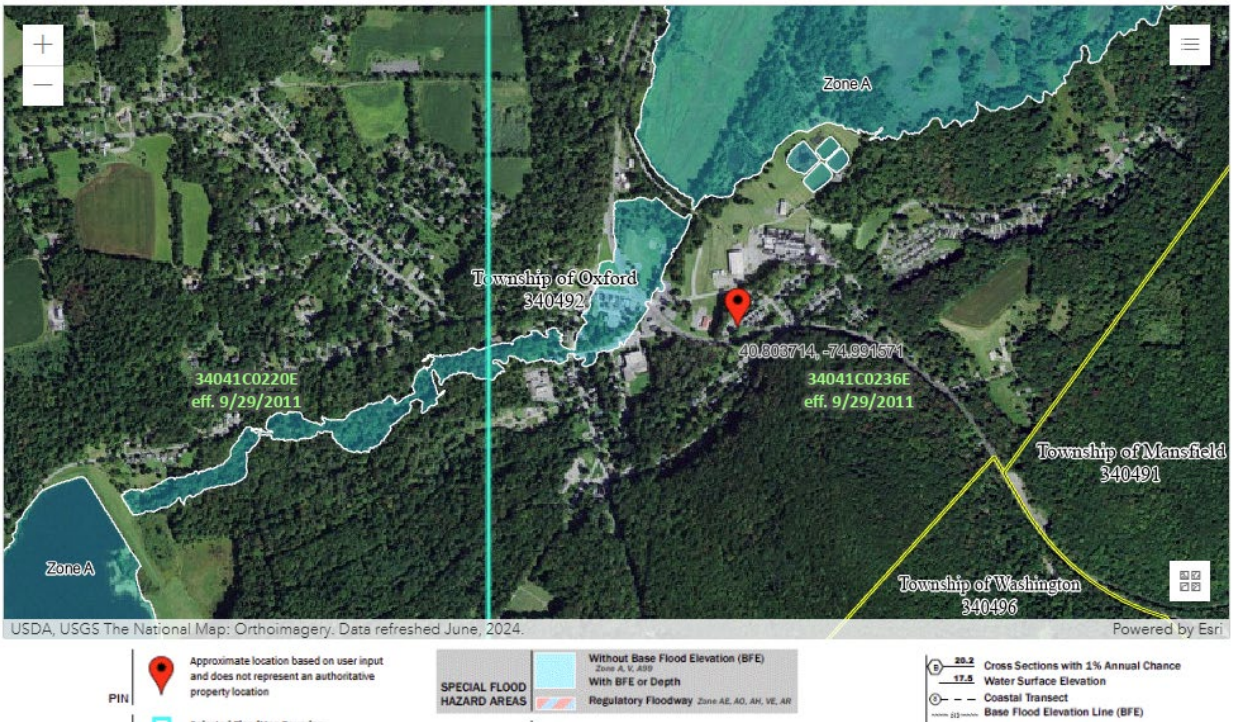

Figure 5 – Snapshot of Flood Prone Areas Identified in FEMA Flood Map Service Center

Goal for the WIP

Oxford Township's goal is to document, map, and assess its MS4 stormwater infrastructure and water quality conditions, forming the basis for future watershed restoration and flood-mitigation projects to be developed in Phase 2 and implemented in Phase 3 of the WIP. This report identifies existing MS4 outfalls and interconnections with other MS4 permittees, receiving waterways, drainage areas to these outfalls and interconnections, and TMDL's and water quality impairments. Overburdened communities, impervious area coverage, and non-municipally owned or operated stormwater facilities within the Township are also identified in this report. Feedback through public engagement will be incorporated into the WIP for a comprehensive WIP strategy to meet the standards of Section H of the Tier A MS4 Permit and incorporate MS4 improvements and solutions specific to Oxford Township.

Public Participation

Engaging with stakeholders opens a channel of communication and collaboration. By connecting with stakeholders early and often, it will lead to the identification of diverse perspectives, build trust and credibility within the community, and allow communities to make informed decisions.

For the development of the WIP, Oxford Township as the MS4 permittee will meet the standards of Section H of the Tier A MS4 Permit and solicit input from stakeholders including but not limited to the following:

- Residents of Oxford Township
- Business owners within Oxford Township
- Owners of private stormwater facilities within Oxford Township
- Adjoining municipalities – White Township, Washington Township, Mansfield Township
- Warren County

Oxford Township will conduct semi-annual public information sessions (in-person or virtual) throughout the development of the WIP including presenting the draft of the Phase 1 Watershed Inventory Report in 2026. These sessions may be included on the agenda for Township Committee meetings, with time allotted for public comment. Public Notice of Township Committee meetings are provided in accordance with State standards and are posted on the Oxford Township webpage under: https://oxfordtwpnj.org/. Public engagement materials include Public Notice and Press Release, Public Comment Form, and the Standard Operating Procedure for Managing Public Comments. Records of any public information sessions and other meetings regarding the WIP will be filed in the Township Clerk's office.

In addition to public information sessions, Oxford Township maintains a dedicated stormwater webpage link located under: https://oxfordtwpnj.org/index.php/about-oxford-township-2-3-3/ which will be updated with information regarding the WIP by the Township Clerk. Upon availability, a summary of feedback received from stakeholders regarding the WIP will be included in this report.

Stormwater Outfalls

Stormwater Outfalls Owned/Operated by Oxford Township

Data including locations of stormwater outfalls owned and operated by Oxford Township were compiled from Oxford's MS4 Infrastructure Map via AutoCAD and Microsoft Excel, the GIS dataset "Outfalls in New Jersey, NJDEP MS4 Inventory and Mapping" under NJDEP Open Data, and field verification by Township Engineering staff. These outfalls were located using GPS. The MS4 outfall dataset from NJDEP Open Data was reviewed and modified prior to the list of Oxford MS4 outfalls being finalized in June 2025. It should be noted that the existing MS4 outfall dataset within Oxford Township in NJDEP Open Data includes MS4 outfalls which are owned and operated by Warren County. These County-owned outfalls were excluded from the list of MS4 outfalls owned and operated by Oxford Township. A total of **20 MS4 outfalls** were therefore identified to be owned and operated by Oxford Township.

Outfall ID	Latitude	Longitude	Receiving Surface Water Body	Water Quality Classification
500	40.8023	-75.0056	Furnace Brook	FW2-TPC1
501	40.8022	-75.0063	Furnace Brook	FW2-TPC1
502	40.8012	-75.0078	Furnace Brook	FW2-TPC1
503	40.8004	-75.0094	Furnace Brook	FW2-TPC1
504	40.7998	-75.0135	Furnace Brook	FW2-TPC1
505	40.7997	-75.0136	Furnace Brook	FW2-TPC1
506	40.7994	-75.0147	Furnace Brook	FW2-TPC1
507	40.7949	-75.0117	Furnace Lake	FW2-TM
508	40.8026	-74.9973	Furnace Brook	FW2-TPC1
509	40.8026	-74.9967	Furnace Brook	FW2-TPC1
510	40.8026	-74.9966	Furnace Brook	FW2-TPC1
511	40.8027	-74.9964	Furnace Brook	FW2-TPC1
512	40.8028	-74.9960	Furnace Brook	FW2-TPC1
513	40.8029	-74.9959	Furnace Brook	FW2-TPC1
514	40.8034	-74.9950	Furnace Brook	FW2-TPC1
515	40.8034	-74.9950	Furnace Brook	FW2-TPC1
516	40.8063	-74.9931	Furnace Brook	FW2-NT
517	40.8113	-74.9937	Furnace Brook Unnamed Tributary	FW2-NT
518	40.8120	-74.9931	Furnace Brook Unnamed Tributary	FW2-NT
519	40.8196	-74.9746	Furnace Brook Unnamed Tributary	FW2-NT

Table 2 – Summary of Oxford Township MS4 Outfalls

Receiving Surface Waters

Table 2 summarizes the Oxford Township MS4 outfalls and the receiving surface waters and water quality classifications for each segment of stream or water body that each of these outfalls discharge into. The receiving surface waters within Oxford Township include Furnace Brook, various unnamed tributaries to Furnace Brook, and Furnace Lake. These surface waters were identified and mapped in the MS4 Infrastructure Map from the GIS dataset "Surface Water Quality Classification of New Jersey" under NJDEP Open Data. In summary:

- 1 outfall discharges directly to Furnace Lake
- 16 outfalls discharge to Furnace Brook
- 3 outfalls discharge to Furnace Brook, Unnamed Tributary

Water Quality Classifications

Table 2 summarizes the Oxford Township MS4 outfalls and the receiving surface waters and water quality classifications for each segment of stream or water body that each of these outfalls discharge into. These surface waters were classified from the GIS dataset "Surface Water Quality Classification of New Jersey" under NJDEP Open Data. In summary:

- 1 outfall discharges to FW2-TM waters
- 15 outfalls discharge to FW2-TPC1 waters
- 4 outfalls discharge to FW2-NT waters

The various water quality designations are explained below:

- FW2-TM: FW2 freshwater (non-Pineland water), trout maintenance, not a Category One waterway
- FW2-TPC1: FW2 freshwater (non-Pineland water) with trout production and is classified as a Category One waterway
- FW2-NT: FW2 freshwater (non-Pineland water), non-trout, not a Category One waterway

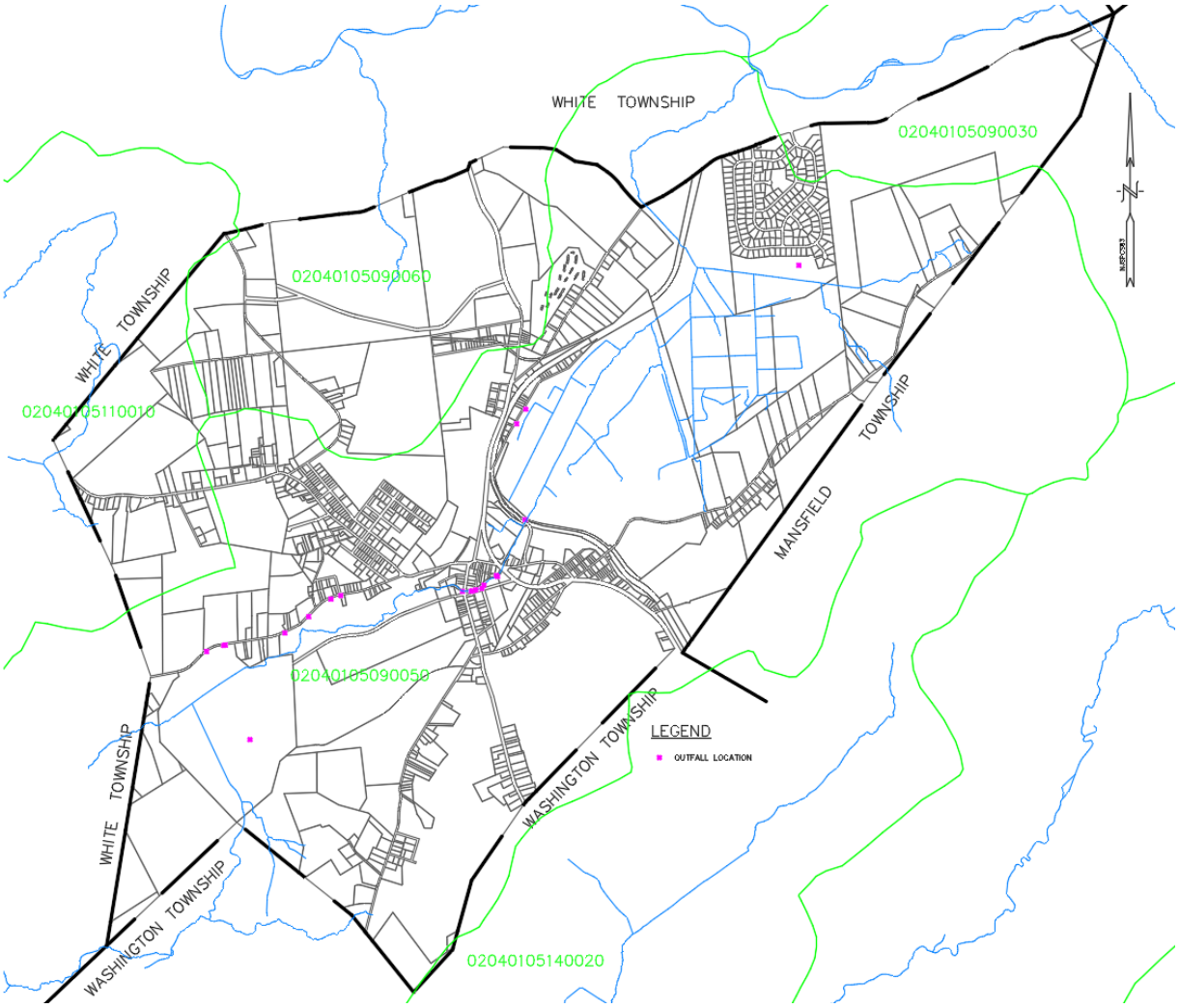

Figure 6 – Oxford Township Owned/Operated Stormwater Outfalls

Stormwater Interconnections

Interconnections from Oxford Township's MS4 into another entity

Data including locations of existing interconnections from Oxford Township's MS4 into other entities have been mapped via AutoCAD and field verified by Township Engineering staff. The Oxford Township MS4 Infrastructure Map was finalized in June 2025 and includes the locations of these interconnections into Oxford Township's MS4. These interconnections are direct pipe connections which convey stormwater from Oxford Township's MS4 system to other MS4 entities. At this time, no areas were identified where Oxford Township's MS4 system discharges into sanitary sewers or combined sewers. The number of interconnections has been identified and summarized below:

- 3 interconnections to White Township MS4
- 5 interconnections to Warren County MS4 (CR 624, CR 631, CR 625)
- 6 interconnections to NJDOT MS4 (Route 31)

Interconnections into Oxford Township's MS4 from another entity

Data including locations of existing interconnections into Oxford Township's MS4 into other entities have been mapped via AutoCAD and field verified by Township Engineering staff. The Oxford Township MS4 Infrastructure Map was finalized in June 2025 and includes the locations of these interconnections from Oxford Township's MS4. These interconnections are direct pipe connections which convey stormwater from other MS4 entities into Oxford Township's MS4 system. At this time, no areas were identified where sanitary sewers or combined sewers discharged into Oxford Township's MS4 system. The number of interconnections has been identified and summarized below:

- 2 interconnections from Warren County MS4 (CR 624)
- 1 interconnection from NJDOT MS4 (Route 31)
- 2 interconnections from Privately-owned MS4 systems

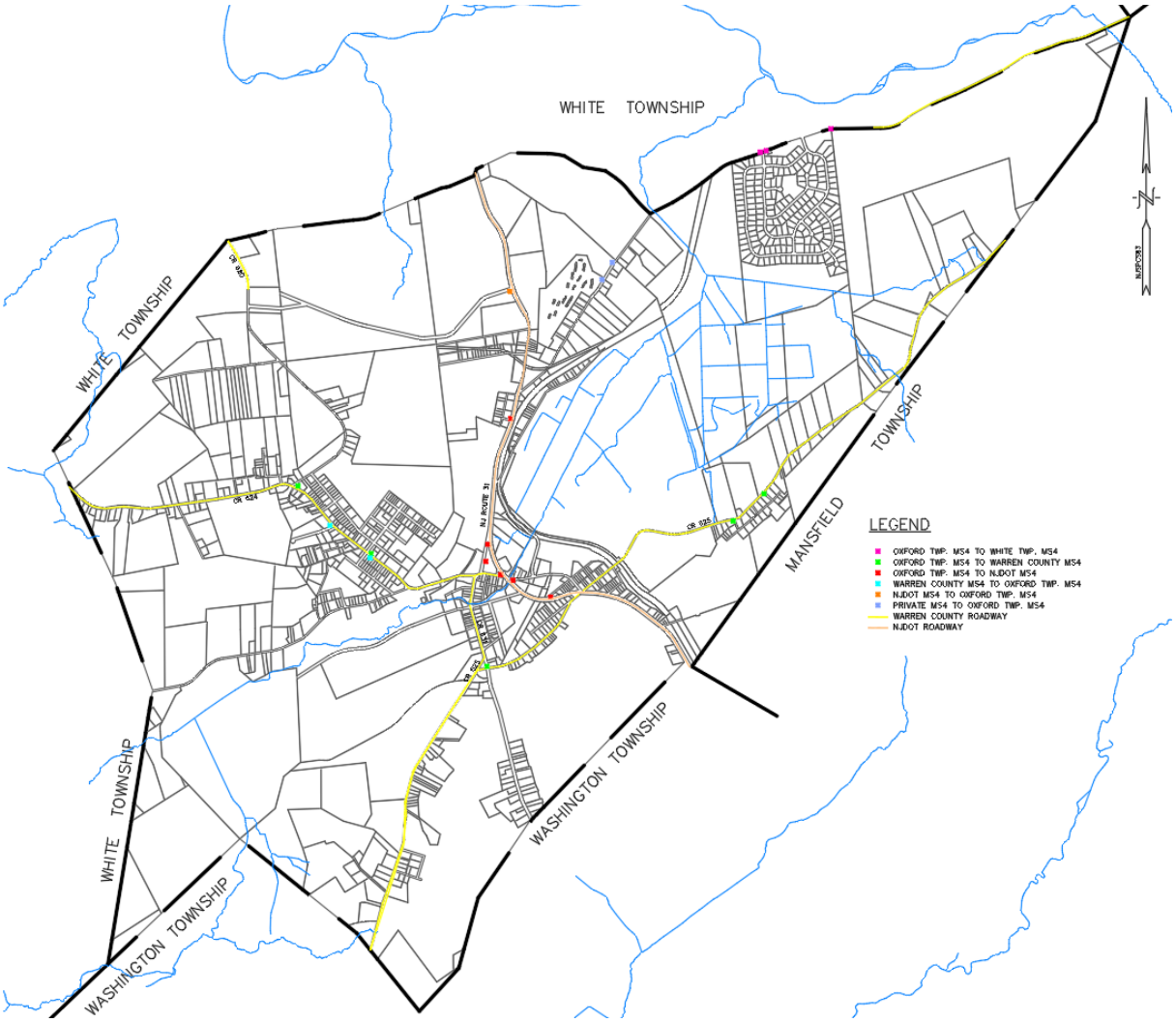

Figure 7 – MS4 Interconnections within Oxford Township

Drainage Areas for Stormwater Outfalls and Stormwater Interconnections

Storm Drain Inlets

Data including locations of existing storm drain inlets owned and operated by Oxford Township have been mapped via AutoCAD and field verified by Township Engineering staff. The Oxford Township MS4 Infrastructure Map was finalized in June 2025 and includes the locations of these inlets within Oxford Township's MS4 system. A total of **269 MS4 inlets** were identified to be owned and operated by Oxford Township, with the breakdown by inlet type summarized below:

- Type "A" Inlets: 46
- Type "B" Inlets: 181
- Type "E" Inlets: 42

MS4 Outfall Drainage Areas

Drainage areas to every outfall owned and operated by Oxford Township have been delineated using lidar topography from the NJ Highlands Council, in combination with aerial imagery. The MS4 Infrastructure Map was finalized in June 2025; and the delineations to the outfall drainage areas were completed in February 2026. The delineated drainage areas account for the drainage area to the upstream conveyance network leading into outfalls owned and operated by Oxford Township. At this time, the delineations depicted in the figure below are preliminary, and may be subject to future revisions in the event additional data is available for a more detailed, precise analysis.

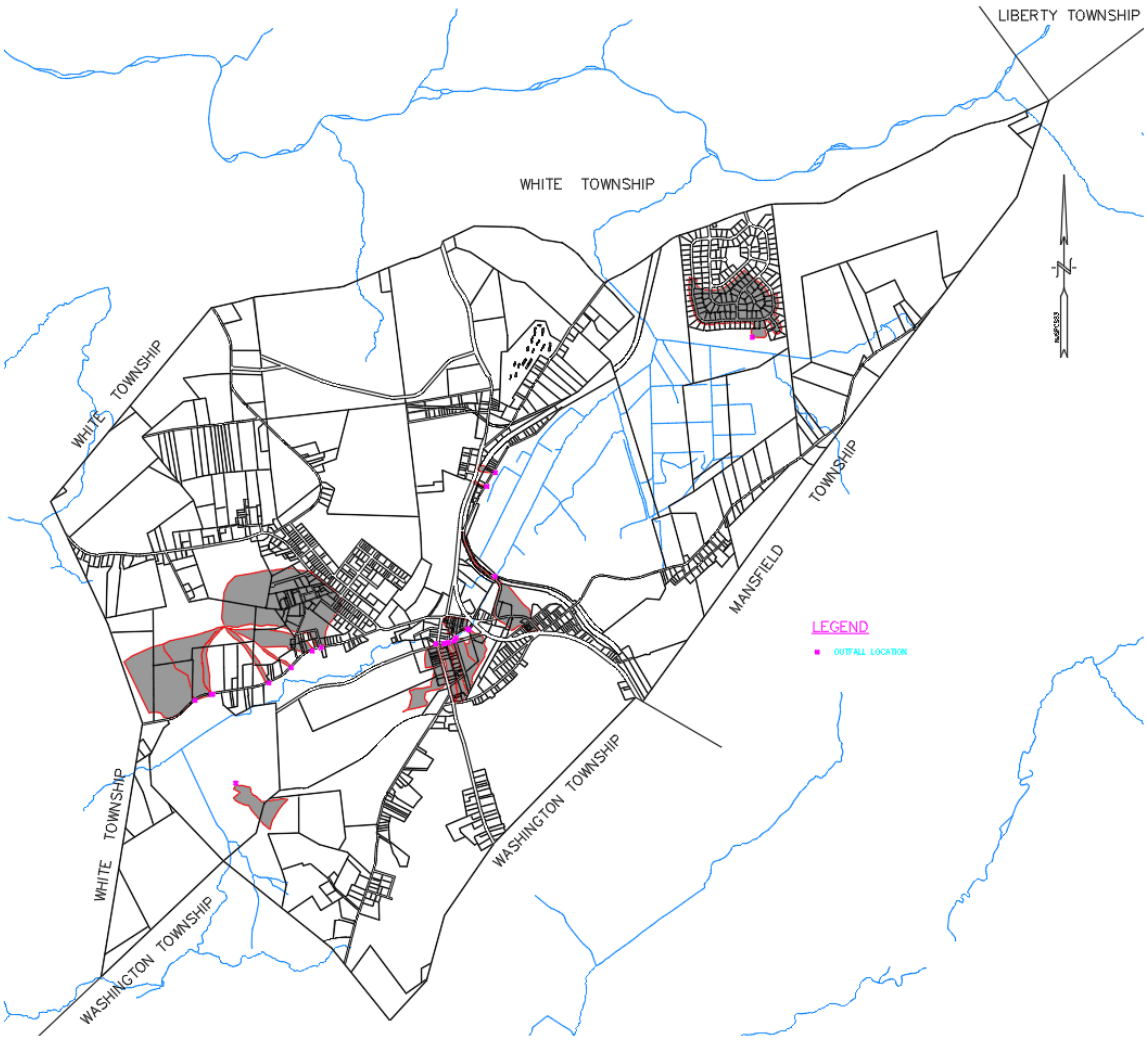

Figure 8 – Outfall Drainage Areas

<u>Drainage area of interconnections from Oxford Township MS4 to another entity</u>

Drainage areas to every interconnection have been delineated using lidar topography from the NJ Highlands Council, in combination with aerial imagery. The MS4 Infrastructure Map was finalized in June 2025; and the delineations to the interconnection drainage areas were completed in February 2026. The delineated drainage areas account for the drainage area to the upstream conveyance network leading into interconnections from Oxford Township's MS4 system to other MS4 entities. At this time, the delineations depicted in Figure 9 below are preliminary, and may be subject to future revisions in the event additional data is available for a more detailed, precise analysis. Figure 9 and Table 3 below include drainage areas of interconnections observed within Oxford Township, including interconnections from other entities into Oxford Township's MS4 system, and interconnections between private entities and State or County MS4 systems.

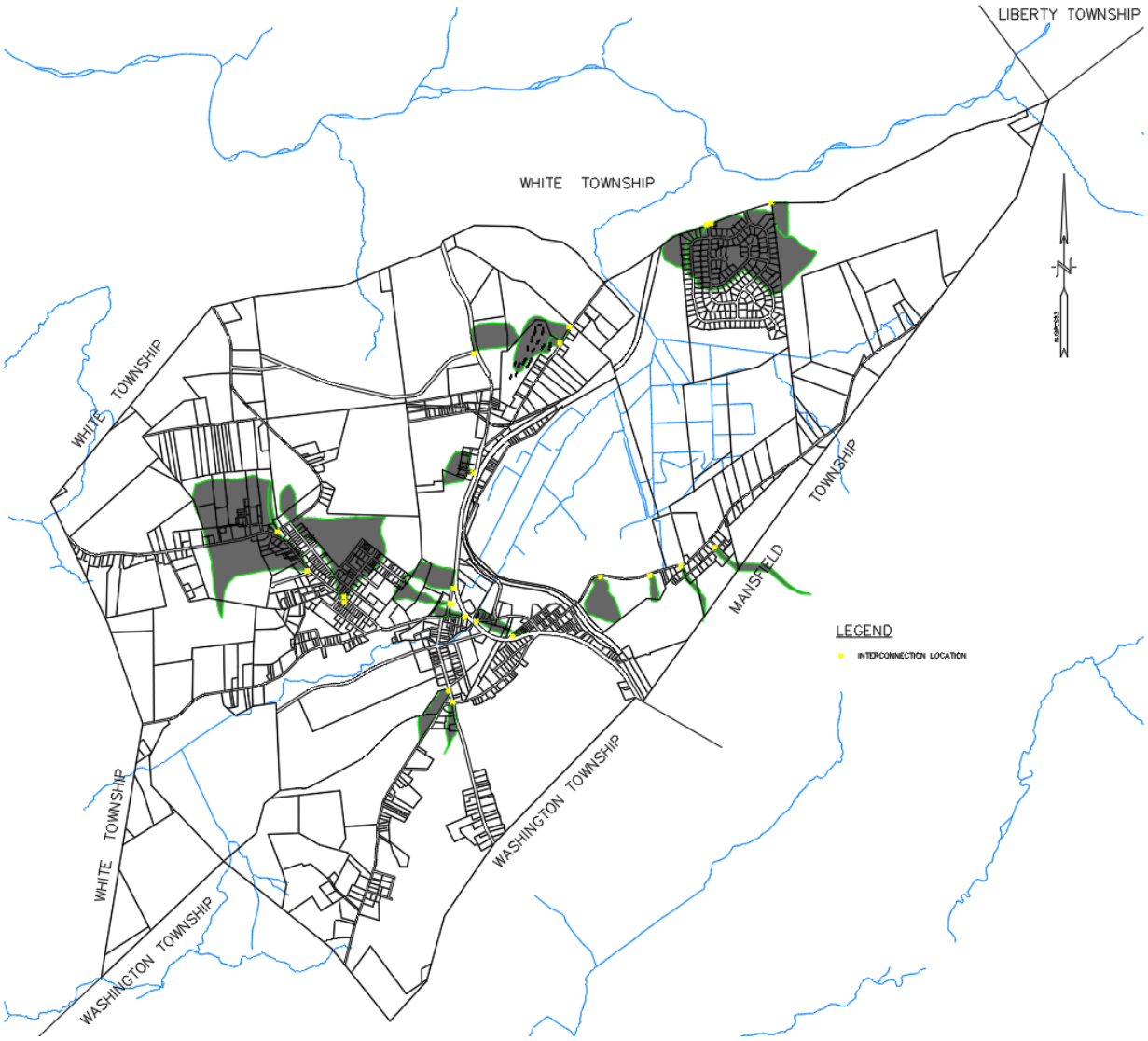

Figure 9 – Interconnection Drainage Areas

Drainage Area ID	Drainage Area (sq miles/sqft/acres)	Interconnection or Outfall	Primary Contributing Drainage Area Type
01	*57.06 acres*	*Outfall #500*	*Residential*
02	*9.05 acres*	*Outfall #501*	*Residential*
03	*0.66 acres*	*Outfall #502*	*Park or Open Space*
04	*2.29 acres*	*Outfall #503*	*Residential*
05	*2.57 acres*	*Outfall #504*	*Park or Open Space*
06	*15.59 acres*	*Outfall #505*	*Park or Open Space*
07	*28.68 acres*	*Outfall #506*	*Park or Open Space*
08	*8.15 acres*	*Outfall #507*	*Park or Open Space*
09	*8.02 acres*	*Outfall #508*	*Residential*
10	*0.15 acres*	*Outfall #509*	*Residential*
11	*3.37 acres*	*Outfall #510*	*Residential*
12	*3.68 acres*	*Outfall #511*	*Residential*
13	*0.29 acres*	*Outfall #512*	*Residential*
14	*5.33 acres*	*Outfall #513*	*Residential*
15	*4.18 acres*	*Outfall #514*	*Commercial*
16	*2.81 acres*	*Outfall #515*	*Commercial*
17	*12.41 acres*	*Outfall #516*	*Park or Open Space*
18	*0.28 acres*	*Outfall #517*	*Residential*
19	*0.69 acres*	*Outfall #518*	*Residential*
20	*32.96 acres*	*Outfall #519*	*Residential*
21	*4.14 acres*	*Interconnection #901*	*Park or Open Space*
22	*64.88 acres*	*Interconnection #902*	*Residential*
23	*7.61 acres*	*Interconnection #903*	*Residential*
24	*13.40 acres*	*Interconnection #904*	*Residential*
25	*1.30 acres*	*Interconnection #905*	*Residential*
26	*9.78 acres*	*Interconnection #906*	*Park or Open Space*
27	*1.80 acres*	*Interconnection #907*	*Park or Open Space*
28	*71.52 acres*	*Interconnection #908*	*Residential*
29	*43.24 acres*	*Interconnection #909*	*Residential*
30	*0.35 acres*	*Interconnection #910*	*Residential*
31	*4.76 acres*	*Interconnection #911*	*Commercial*
32	*2.77 acres*	*Interconnection #912*	*Residential*
33	*9.33 acres*	*Interconnection #913*	*Residential*
34	*1.57 acres*	*Interconnection #914*	*Residential*
35	*1.74 acres*	*Interconnection #915*	*Park or Open Space*
36	*4.57 acres*	*Interconnection #916*	*Park or Open Space*
37	*0.78 acres*	*Interconnection #917*	*Residential*
38	*3.61 acres*	*Interconnection #918*	*Commercial*
39	*2.02 acres*	*Interconnection #919*	*Park or Open Space*
40	*4.88 acres*	*Interconnection #920*	*Park or Open Space*
41	*7.72 acres*	*Interconnection #921*	*Park or Open Space*
42	*5.85 acres*	*Interconnection #922*	*Residential*

Table 3 – Summary of Oxford Township MS4 Interconnection and Outfall Drainage Areas

TMDLs and Water Quality Impairments

The Federal Clean Water Act (CWA) requires TMDLs (Total Maximum Daily Loads) for pollutants causing designated use impairments in surface waters. In accordance with Section 303(d) of the CWA, NJ State is also required to biennially prepare and submit to the US EPA a report which identifies waters that do not meet or are not expected to meet surface water quality standards (SWQS) after implementation of technology-based effluent limitations or other required controls.

For NJ, a TMDL quantifies the amount of a pollutant a water body can assimilate without violating NJ water quality standards and allocates that load capacity to known point and nonpoint sources. Pollutant sources which affect the water quality of NJ surface waters include the following:

Point sources include:

- Municipal wastewater treatment plant discharges
- Industrial wastewater treatment plant discharges
- Stormwater runoff (residential, agricultural)

Nonpoint sources include:

- Excess fertilizer in runoff (residential, agricultural)
- Urban stormwater runoff containing oil, grease, and toxic chemicals
- Sediment from construction sites, farmland, forest land
- Salt from irrigation or de-icing
- Bacteria from animal waste
- Atmospheric deposition (the transfer of air pollutants to the earth's surface)

TMDLs are intended to diagnose the sources of pollution and quantify water quality recovery to ensure that all NJ surface waters including rivers, lakes, and streams can be safely used for recreation, aquatic life, water supply, trout maintenance, and shellfish harvesting designated uses.
A number of TMDLs and impairments associated with surface waters within Oxford Township have been identified and cross-referenced between various tools including NJ-WET, the TMDL Look-Up Tool, and NJDEP's ArcGIS 2022 Integrated Report (Reference #2). The following table provides a summary of the reported stream and lake TMDLs and impairments for each HUC14 within or bordering Oxford Township. No shellfish TMDLs have been identified within Oxford Township.

HUC14	Subwatershed Name	TMDL(s)	Impairments
02040105110010	Pophandusing Brook	N/A	Escherichia Coli (E. Coli)
02040105090050	Furnace Brook	Streamsheds: Total Phosphorus (2010) Fecal Coliform (2003) Lakesheds: Fecal Coliform (2007)	PCBs in Fish Tissue pH Temperature
02040105090060	Pequest River (Below Furnace Brook)	Streamsheds: Fecal Coliform (2003)	pH
02040105090030	Pequest River (Furnace Brook to Cemetary Rd)	Streamsheds: Total Phosphorus (2010) Fecal Coliform (2003)	N/A
02040105140020	Pohatcong Creek (Brass Castle Creek to Route 31)	Streamsheds: Fecal Coliform (2005)	Phosphorus, Total Total Suspended Solids (TSS) Temperature

Table 4 – Summary of TMDLs and Impairments for HUC14s within or bordering Oxford Township

Environmental impacts of the TMDLs and impairments listed above for subwatersheds within, or bordering Oxford Township are described as follows and referenced from NJDEP's Pollutants of Concern document (Reference #4). Part F of the Oxford Township Tier A MS4 Permit outlines requirements to minimize and address pollution sources through actions including but not limited to the adoption of community-wide ordinances, community-wide measures, inspections of stormwater facilities owned/operated by Oxford Township, inspections of privately owned/operated stormwater facilities, and good housekeeping and best management practices of municipal maintenance yards and other ancillary operations owned/operated by Oxford Township.

E. Coli

E. coli is a pathogen originating from human and animal excrement. Waterways receiving stormwater runoff which come into contact with pet waste, waste from wildlife (ie. geese), some farming activities, illicit discharges, failing sewage conveyance systems and septic systems, combined sewage overflows, and sanitary sewer overflows (SSOs) are exposed to this pathogen. The presence of e. coli in waterways is harmful to human and animal health and can cause intestinal disease.

- E. coli has been identified in the Pophandusing Brook subwatershed.

Polychlorinated Biphenyls (PCBs):

PCBs are a toxic chemical that was widely used for industrial production up until 1979. Some products today continue to contain PCBs including electrical equipment, motor and hydraulic oils, oil-based paint, and some plastics. PCBs are carried away as total suspended solids by stormwater runoff from products containing these compounds. Additionally, PCBs are moderately volatile and can be carried aloft by the wind and deposited on exposed surfaces via air deposition. PCBs bioaccumulate in leaves and above-ground portions of plants including agricultural crops, and aquatic life in affected waterbodies. High concentrations of PCBs contribute to organ damage and carcinogenesis in affected fish further up the food chain.

- PCBs in fish tissue have been identified in the Furnace Brook subwatershed.

pH:
Fluctuations in pH of water occur when chemicals or pollutants are present in stormwater runoff which then collects into streams and ponds. Air pollution in the atmosphere can also cause “acid rain” which affects and lowers the pH of waterbodies. Pollutants include ammonia, sulfur, battery acids, lime, cement, wet or fresh concrete, fertilizers, compost, etc. Fluctuations in pH causing water to be basic (pH > 7) or acidic (pH <7) negatively impacts aquatic life and biodiversity.

- pH impairments have been identified in the Furnace Brook and Pequest River (Below Furnace Brook) subwatersheds.

Phosphorous/Total Phosphorous:
Total phosphorous is the sum of particulate and dissolved phosphorous in both organic and inorganic forms. Phosphorus is a key nutrient for plant growth, however, an excess of phosphorous in surface waters leads to overgrowth of algae and large aquatic plants (eutrophication) along with significant fluctuations in pH and dissolved oxygen. An excess of phosphorous can also lead to HABs that produce toxins harmful to human and animal health. Water supply sources containing excess phosphorus leading to excess algae growth require more extensive disinfection and oxidants.

- Total phosphorus impairments have been identified in the Pohatcong Creek (Brass Castle Creek to Route 31) subwatershed.

Temperature:
Fluctuations in the temperature of waterbodies affect the concentration of dissolved oxygen in the water. Cold, deeper water holds more dissolved oxygen compared to warmer water and is necessary to sustain aquatic life including trout. Temperature impairments in the receiving waters can be due to heating of stormwater runoff as it runs across hot paved areas, such as roadways and parking lots, overflow of heated stormwater ponded in basins, stream bank erosion that widens the stream and creates more shallow stream beds, and increased solar incidence in areas where shading vegetation is lacking in the riparian buffer.

- Temperature impairments have been identified in the Furnace Brook and Pohatcong Creek (Brass Castle Creek to Route 31) subwatersheds.

Total Suspended Solids (TSS):
Total suspended solids refer to particles which are picked up by stormwater runoff into receiving waterbodies. These particles can include pavement (from wear), vehicle exhaust emissions, vehicle parts, building and construction material, road salt, road paint, pedestrian debris, soil material, plant and leaf litter, and may contain heavy metals as well as atmospheric deposition of particles that may be transported from outside of the municipality. TSS is one of the most common pollutants found in stormwater runoff. TSS harms aquatic life and the quality of drinking water. Organic TSS, such as decomposing matter or sewage effluent from illicit connections and/or SSOs include high levels of microorganisms such as protozoa, bacteria, and viruses. Such pathogens contribute to waterborne diseases like cryptosporidiosis, cholera, and giardiasis. Turbid water, whether due to organic or inorganic material, cannot be easily disinfected at potable water treatment facilities, as the suspended particles will “hide” these microorganisms.

- TSS impairments have been identified in the Pohatcong Creek (Brass Castle Creek to Route 31) subwatershed.

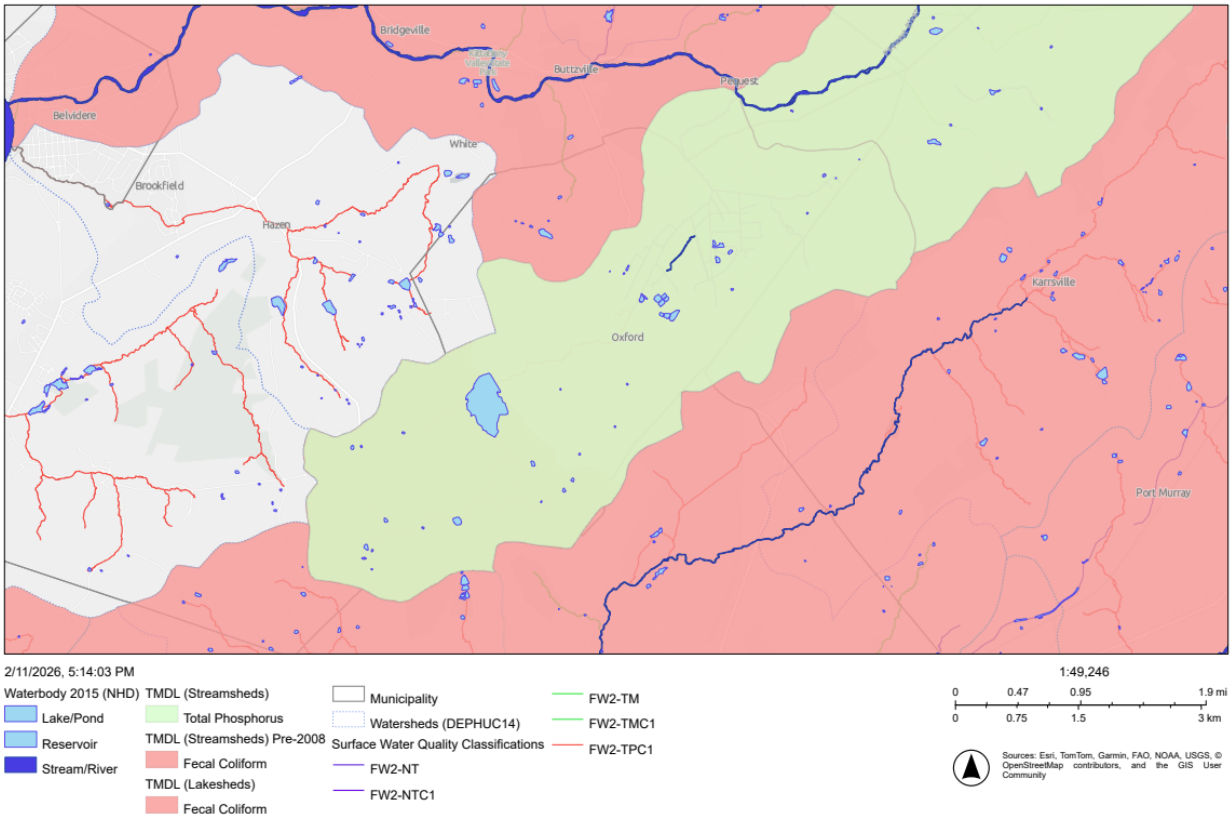

Figure 10 – TMDLs by Parameter Related to Stormwater for Oxford Township

Overburdened Communities

NJ-WET has not identified any overburdened communities within Oxford Township. The nearest overburdened community to Oxford Township is within neighboring Mansfield Township. Overburdened communities are areas where residents face a higher burden of environmental pollution and health risks, and are defined by the NJDEP as census block groups with:

1. At least 35 percent low-income households; or
2. At least 40 percent of the residents identify as minority or as members of a State recognized tribal community; or
3. At least 40 percent of the households have limited English proficiency

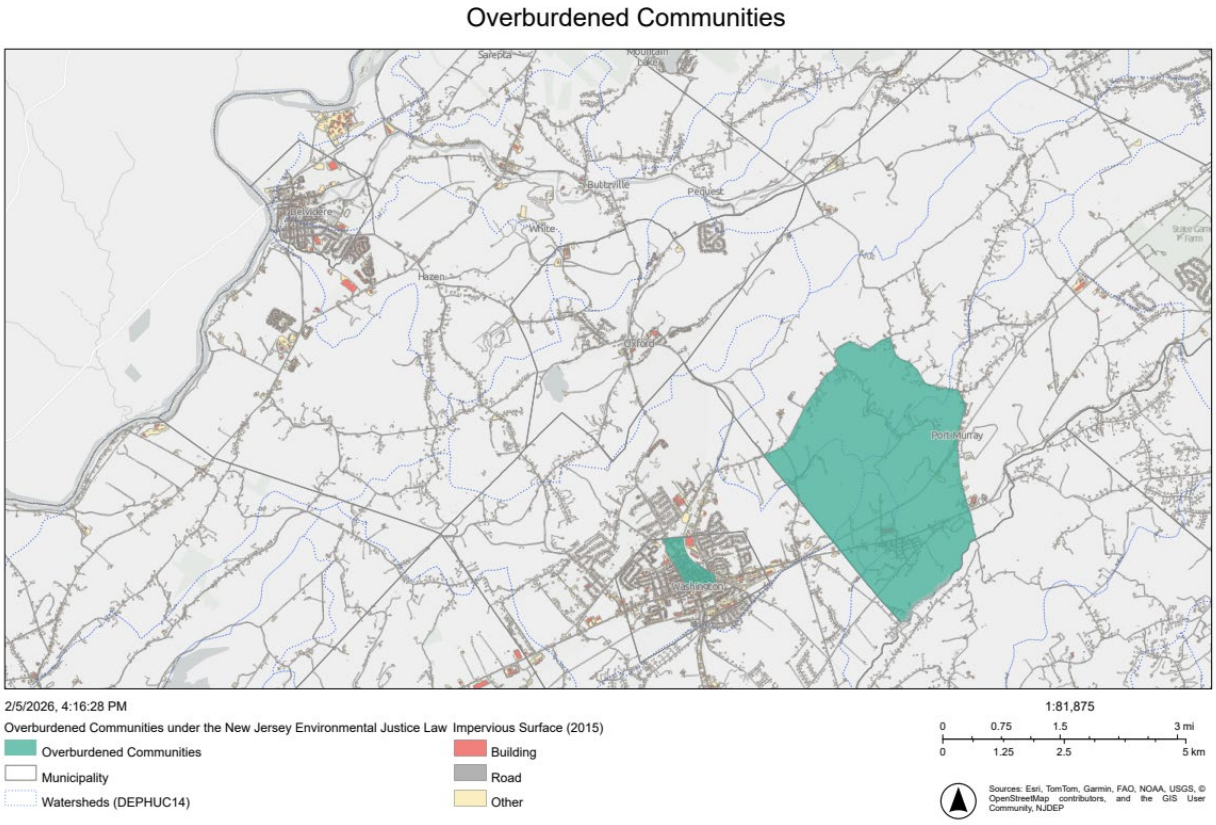

Figure 11 – Oxford Township Overburdened Communities Map

Impervious Area

An impervious surface analysis was conducted using 2020 Land Use/Land Cover data from NJDEP Open Data. The shape file from this dataset was imported into AutoCAD, preserving the attributes of each area and its type of land cover within Oxford Township. Aerial satellite imagery provided by Microsoft Bing through Autodesk's online mapping tool was overlain to verify the types of land cover present within Oxford Township. The impervious surface analysis was conducted in February 2026.

To assess the extent of impervious coverage within Oxford Township, land areas from the 2020 Land Use/Land Cover dataset with the "urban" and "barren land" land use designations were closely reviewed and cross-referenced with aerial imagery. Areas including buildings, roadways (pavement and gravel), and other paved surfaces including driveways, parking lots, and swimming pools were included as impervious cover. For this analysis, Furnace Lake and all other waterbodies were considered impervious surfaces since no infiltration within these areas is anticipated. To simplify the analysis, most of the areas of medium and high-density residential areas was considered impervious cover. Therefore, the estimate of impervious coverage within Oxford Township is a conservative estimate.

As noted in NJDEP's Land Use and Land Cover webpage, impervious coverage is considered a useful indicator of land development impacts on water resources. Land developed and converted into impervious cover alters drainage patterns as infiltration is prevented through these surfaces. As runoff travels through impervious surfaces such as parking areas, driveways, and roadways, pollutants are often picked up prior to the runoff ultimately discharging to a waterway. Water quality impairments such as the impairments noted in the "TMDLs and Water Quality Impairments" section of this report negatively affect biodiversity of aquatic life in waterways.

Figure 12 depicts the areas of impervious coverage verified within Oxford Township following the impervious surface analysis. Approximately **611.58 acres** of impervious area is present within the Township, accounting for **15.9%** of the total area of the Township. The area of impervious coverage excluding Furnace Lake is **555.63 acres**, or **14.4%** of the total area of the Township. An approximate breakdown of the percentage of impervious cover in each subwatershed within Oxford Township (including Furnace Lake) is provided on Table 5 below.

Subwatershed Name	HUC-14	Subwatershed Area (acres)	Impervious Area (acres)	Impervious Area (%)
Pophandusing Brook	02040105110010	258.37 acres	36.67 acres	14.2%
Furnace Brook	02040105090050	2,756.59 acres	493.00 acres	17.9%
Pequest River (Below Furnace Brook)	02040105090060	613.58 acres	70.00 acres	11.4%
Pequest River (Furnace Brook to Cemetary Rd)	02040105090030	217.91 acres	11.91 acres	5.5%
Pohatcong Creek (Brass Castle Creek to Route 31)	02040105140020	1.55 acres	0.0 acres	0%

Table 5 – Impervious Areas within each Subwatershed in Oxford Township

Figure 12 – Impervious Areas within Oxford Township

Non-Municipally Owned or Operated Stormwater Facilities

Data including locations of non-municipally (privately) owned or operated stormwater facilities within Oxford Township have been mapped via AutoCAD and field verified by Township Engineering staff. The Oxford Township MS4 Infrastructure Map was finalized in June 2025 and includes the locations of these privately owned and operated stormwater facilities. A total of **two (2)** privately owned and operated stormwater facilities within Oxford Township have been identified and are noted in the table and figure below. Privately owned stormwater outfalls have not been identified within Oxford Township.

Data of privately owned and operated stormwater facilities within Oxford Township will be updated annually following the construction of new, privately owned facilities in approved major development or redevelopment projects.

Local ID	Type	Owner	Block	Lot	HUC14	Subwatershed Name
BMP-4	Detention Basin	Highlander Hills Estates	34	3	02040105090050	Furnace Brook
BMP-5	Detention Basin	Word of Life Church	2	61	02040105090050	Furnace Brook

Table 6 – Summary of Non-Municipally Owned or Operated Stormwater Facilities in Oxford Township

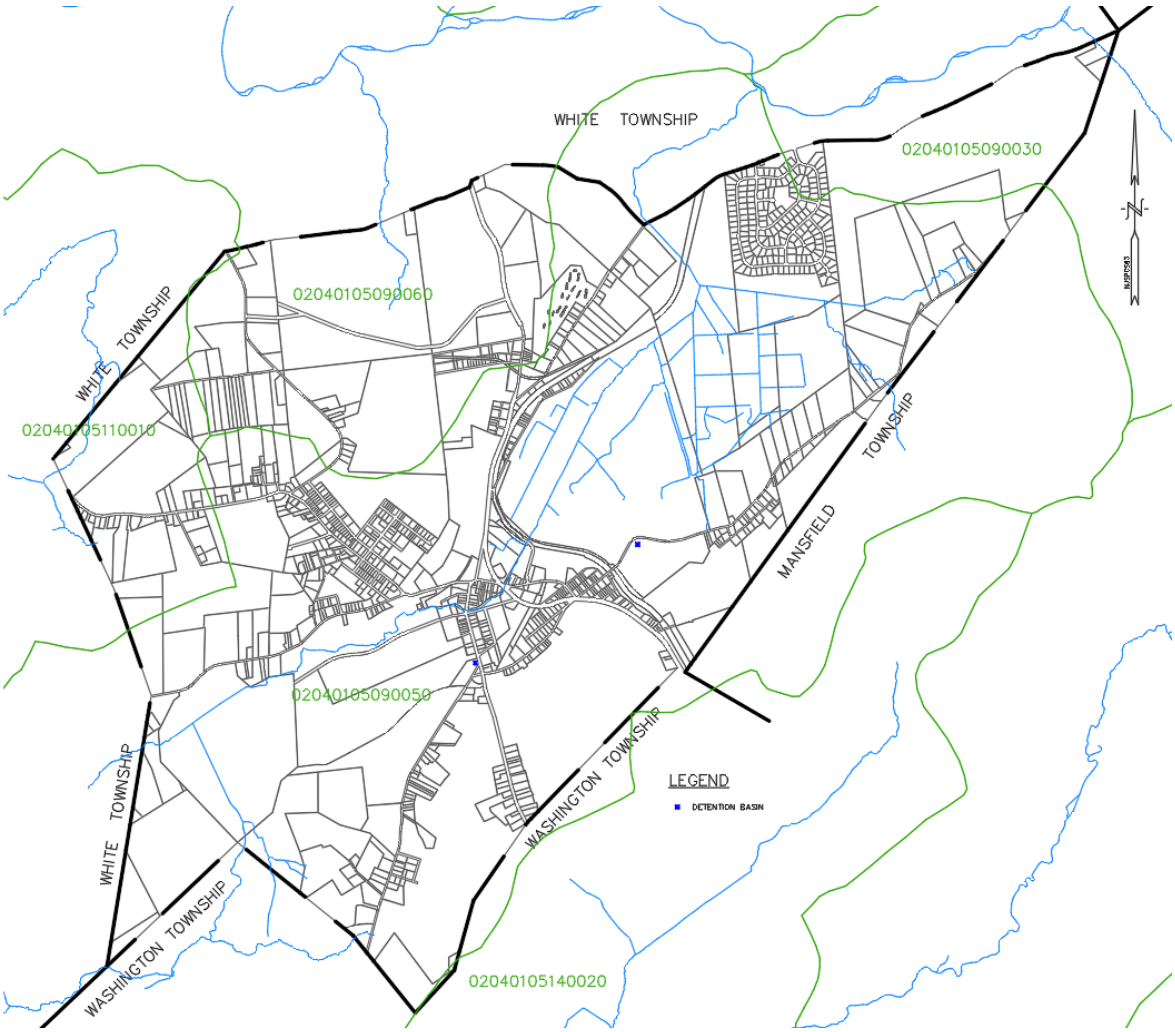

Figure 13 – Non-municipally Owned/Operated Stormwater Facilities in Oxford Township

Conclusion

The Watershed Inventory Report, Phase 1 of the Watershed Improvement Plan has been prepared in accordance with the requirements under Section H of Oxford Township's Tier A MS4 permit. This report has been prepared in conformity with the MS4 mapping which has been completed and submitted as an electronic map to the NJDEP; and identifies Township owned and operated stormwater infrastructure including outfalls, inlets, and interconnections with infrastructure owned and operated by other MS4 entities. Non-municipally owned and operated stormwater management facilities have also been identified.

Additionally, the report describes stream classifications and subwatersheds within the Township and describes the TMDLs and water quality impairments which are present. The report provides an analysis of existing land cover within the Township including impervious coverage, and maps drainage areas to MS4 outfalls and MS4 interconnections.

Public engagement in addition to the data collected will be essential in the development of the Watershed Assessment Report, Phase 2 of the Watershed Improvement Plan. The data collected from Phase 1 of the Watershed Improvement Plan will provide the groundwork to pinpoint areas of concern and propose potential water quality improvement projects for impaired waterbodies within the Township.

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