

Township Of East Windsor Green Team

# East Windsor Township Water Story

Completed in partial fulfillment of the requirements for sustainable Jersey's Water Story Action



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# Introduction

## Background

East Windsor Township is located in central New Jersey and is bisected by the New Jersey Turnpike, Route 33, and Route 130. The municipality spans 10,032 acres, forming a ring around the municipality of Hightstown Borough. According to 2000 U.S. Census data, East Windsor's 24,919 residents occupy 15.6 square miles at a density of 1,597 individuals per square mile. The area to the west of the New Jersey Turnpike has undergone significant development, but East Windsor has taken aggressive steps to preserve farmland located in the southeast and eastern portions of the township. Currently, about 20 percent of the township is under farmland assessment and over 23 percent of the township is preserved open space.

The New Jersey State Legislatures incorporated East Windsor Township on February 22, 1798. The Township of East Windsor is situated in the northeast corner of Mercer County. The Millstone River forms the northern boundary line for both East Windsor Township and Mercer County. The Borough of Hightstown is located in its entirety within the north central portion of East Windsor Township at the crossroads of New Jersey State Highway 33, County Route 539 and County Route 571.

Early homebuyers, who came to East Windsor Township were from urban areas of New York City, appreciated the opportunity to live in a rural setting and within close proximity (commuting) to Philadelphia, New York City and within three to four hours of Washington D.C. and Boston via the New Jersey Turnpike.

Within its 15.66 square miles, housing developments were clustered along the Rt.130, Rt. 33, and Rt.539 (Old York Road) corridors. This allowed access to major roadways for easier commuting. Parks and open space were nestled in these developments to allow for the rich beauty and rural setting that East Windsor Township offers.

The southeast section of East Windsor Township is made up of farms, open space and preserved farmlands, establishing an ethos of Environmental Stewardship throughout the community.



**Fig . 1 Aerial view of East Windsor Twp Farms and Open Space**



**Fig. 1a - Fresh Apples and Peaches**



**Fig. 1b - Local Farms**



**Fig. 1c - Local Farm Fresh Vegetables and Fruits**



continue to be operated by the East Windsor Municipal Utilities Authority, with more than 90% of the houses utilizing those services. The issues involved in maintaining these facilities will be further explored in Chapters 3 and 4.

The Township is bordered by the Upper Millstone River to the northwest, Etra Lake, to the east and the Rocky Brook, which meanders through the center of the Township. The surrounding and Township owned conservation areas are integral in keeping the impervious surface level of the Township as low as possible. The Township's goal is to stay below the 10% threshold for a sub-watershed to be considered impaired for water quality. At the same time, even with these wetland and undeveloped buffers, there are a few East Windsor streets, that during major rain events, do experience periodic flooding and stormwater run-off which creates hazards for drivers and pedestrians, not to mention potential damages to property. Causes of flooding and potential solutions will be explored in Chapter 5.

Similar to many rural and suburban areas throughout the state, the Township of East Windsor has been experiencing development pressures. This is due in part to the location of the denser community of Hightstown Borough within East Windsor Township. Additionally, the location of a New Jersey Turnpike interchange within the Township and numerous intersections of major arterial and collector roads tend to promote development.

Additionally, East Windsor Township contains a wide variety of housing, from historic Victorians and contemporary executive homes, to townhouses, condominiums and apartments. East Windsor Township municipal officials are appropriately proactive in managing the growth of the township in order to achieve a balanced development pattern which enhances the quality of life for the residents of the Township.

An integral part of East Windsor Township is the variety of natural features situated amidst the portions of the Township which have developed or are planned by the Township to be developed. The natural features contained within the Township include wetlands, steep topographic slopes, flood plains, an important aquifer recharge area and rivers and streams. Additionally, the Townships geological formations and soil characteristics present important considerations for land development and land preservation.

## Focus and Outcomes of Our Water Story

The primary focus of this water story is to provide a blueprint for continuing the ethos of working with rather than against nature and our environment. This is as relevant today as it was when East Windsor Township was founded, especially with climate change occurring, loss of habitat and biodiversity, and disruption of terrain that is integral to a natural water cycle and will progressively impact our way of life. In line with the New Jersey Department of Environmental Protection, the Township will need to develop strategies to help mitigate the potential increased flooding of our roads and land and pollution of our wetlands and downstream creeks. This document aims to provide a context for that.

A secondary focus of this water story is to give the current and future residents of East Windsor Township a comprehensive understanding, in plain language, of the public health, fiscal and environmental challenges and benefits that guide policy decisions surrounding a publicly owned and operated drinking and wastewater facility. These municipal – owned and operated water and wastewater facilities are also a part of what makes the Township of East Windsor’s water story unique.

Long term outcomes, based on the above foci, are to

- Inform residents and policy makers of sustainable, environmentally friendly actions that can be taken to best accommodate our continuing changing surface water and stormwater
- Provide residents with a comprehensive understanding of the drinking and wastewater systems, including the fiscal, environmental and public health impacts that result from current and future decisions made by the Township.

In addition, planning goals include working with 3<sup>rd</sup> and 4<sup>th</sup> grade classes in the East Windsor schools to investigate these foci and generate opportunities for discussion and exploration of potential solutions. Immediate outcomes include a set of lesson plans and student-created projects that they would present to the community.



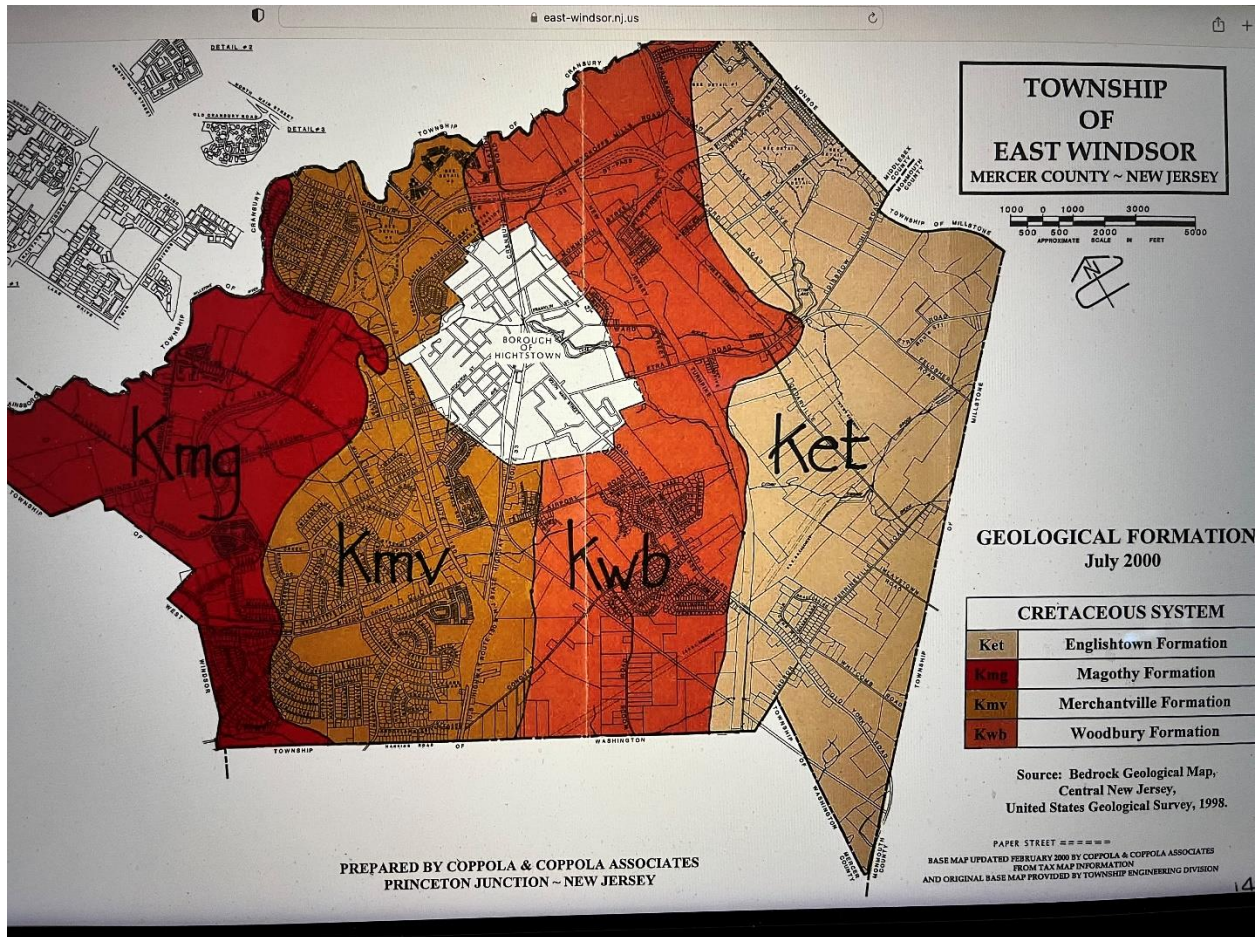


Fig. 3 - Geological Formation

# CHAPTER ONE: WATER RESOURCES IN EAST WINDSOR TOWNSHIP

## Section One: East Windsor Township Hydrologic Setting

East Windsor Township sits on a hydrologic divide, encompassing headwater tributaries for both the Delaware River and the Raritan River.

The Township of East Windsor is in northeastern Mercer County, New Jersey. It is geologically in the inner-upland physiographic subdivision of the Atlantic Coastal Plain that runs along the eastern Atlantic coastline and as such, has low elevation (generally less than 200') and is covered mainly with sandy/sandy loam soil deposits with clay (fig. 3).

The creeks and tributaries in East Windsor are part of the Millstone River basin. The largest is the Rocky Brook sub-watershed area (HUC 13) which is part of the Rocky Brook that meanders through Monmouth County and is upstream of the Millstone River Basin (HUC-14 2030105100050). This is part of the Upper Delaware/Northwest (#4) water region and the Millstone Watershed Management area which eventually drains into the Delaware River and Raritan River.

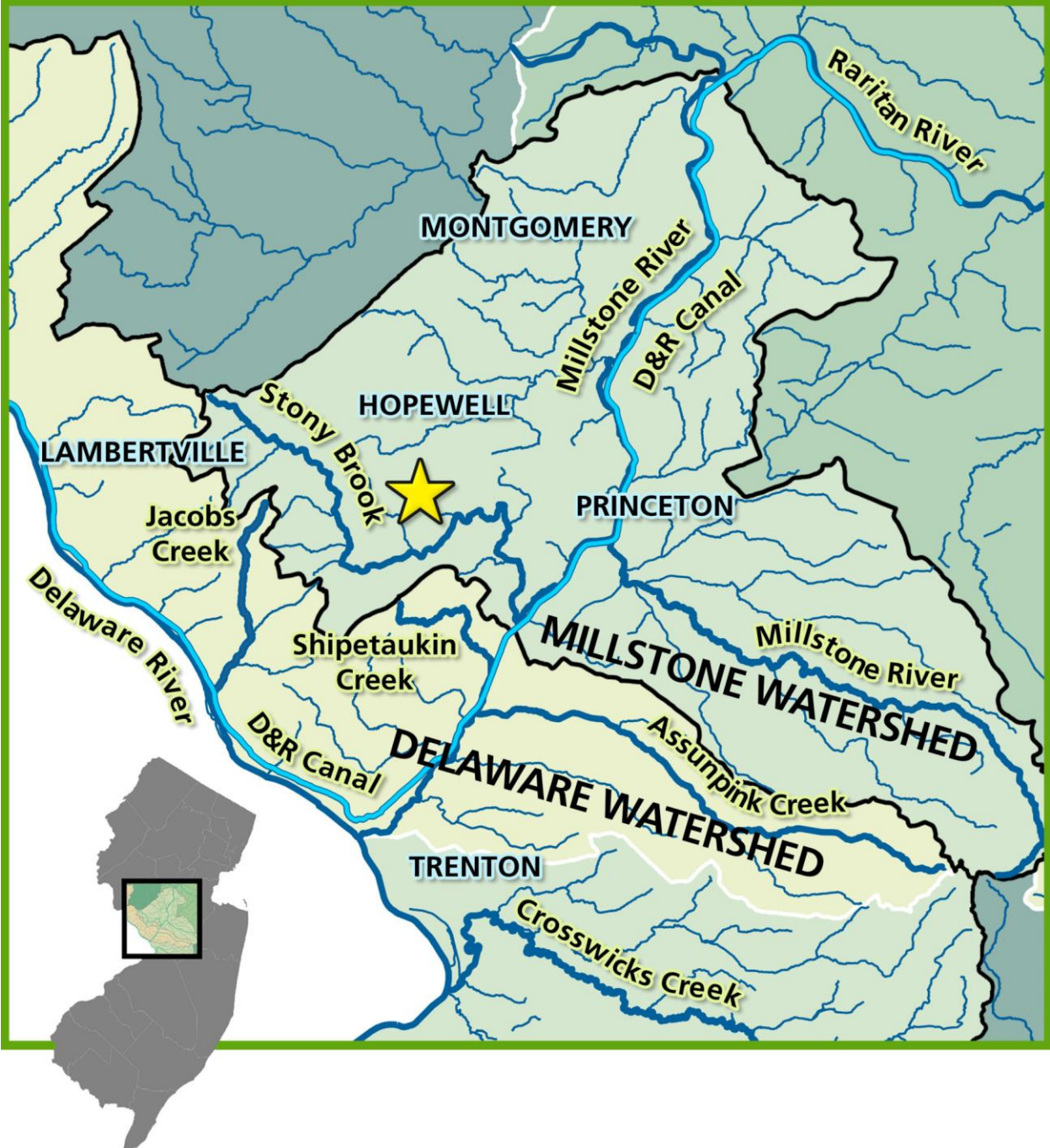


Fig. 4 - Millstone and Delaware Watershed

A section on the south-central side of the Township is in the Rocky Brook sub watershed (above the Monmouth County Line) sub-watershed areas (HUC14 02030105100040 and HUC14 02030105100050) which is in the Millstone River (above Carnegie Lake) watershed area (HUC11 02030105100). This is part of the Raritan (#2) water region and Millstone (#10) Watershed Management area which eventually drains into the Raritan River. The streams in this area are the three tributaries of Rocky Brook which flow into East Windsor Township from Millstone to the east and eventually flowing through East Windsor Township/Hightstown to the Millstone River. Since the Rocky Brook Flows through Millstone, Roosevelt and Hightstown, it is therefore impacted by development in those communities.



Fig. 5 - Upper Millstone Watershed

## Section Two: Surface Water Quality

Many of the Rocky Brook tributaries in East Windsor Township have been classified as FW2-NT. The Millstone River is classified as a FW2-NT-C1.

As shown in Fig 5, creeks and tributaries in East Windsor Township are classified as FW2-NT (Freshwater which maybe subject to man made wastewater discharges, with no trout). In accordance with N.J.A.C. 7:98 Surface Water Quality Standards, the primary use of these streams in East Windsor Township is for maintenance, migration, and propagation of the natural and established biota.

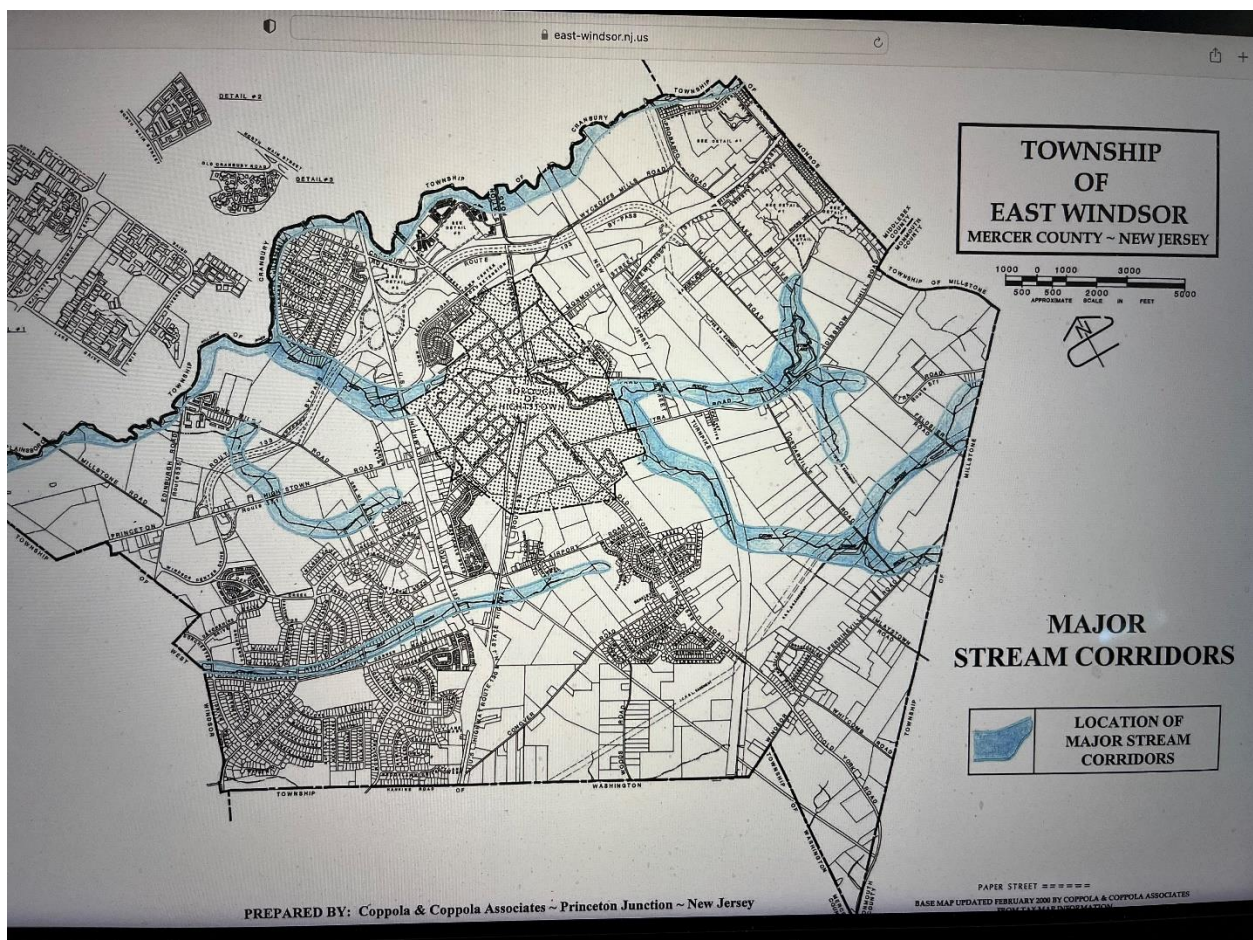


Fig 6 - Major Stream Corridors in East Windsor Township

Furthermore, much of the Millstone tributaries have been given a C1 (Category 1) antidegradation designation indicating those bodies of water are “protected from

*any measurable change to existing water quality because of their exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources”.* (Bureau of Environmental Analysis, Restoration and Standards, Surface Water Quality Standards (SWQS)). C1 streams are required to have a 300’ buffer and non-C1 (C2) streams are required to have a 50’ buffer from each bank side.

Chapter 22, East Windsor Township Technical Standards for the Construction of Improvements addresses Stormwater Management conditions for development. East Windsor Township requires NJDEP permitting from developers who develop in areas where wetlands may be present or in areas of streams and rivers. NJDEP specifies a minimum 50’ – 150’ buffer but also requires that stream buffers include adjacent 100-year floodplain areas, wetlands and wetlands transitional areas, based on recommendations from the Natural Resource Inventory Report. The Impervious Cover Assessment and Reduction Action Plan that was prepared December 30, 2020 for East Windsor Township by the Watershed Institute similarly recommends a 150’ buffer for C2 streams in order to provide stream corridor protection. There are no properties that are not in compliance with this increased buffer recommendation.

### Section Three: National Wild and Scenic Rivers

East Windsor Township does not have any streams or river segments that are part of, or contribute to, a National Wild and Scenic River.

Although no streams are part of the National Wild and Scenic River program, the Millstone River (which includes tributaries with headwaters in East Windsor Township) does flow into the Carnegie Lake then to the Raritan River.

## Section Four: Wetlands

All of East Windsor Township's creeks are encompassed within wetlands designated areas, creating ecosystem for many plants and animals.

The relatively flat landscape allows riparian wetlands to be created along all streams seen in Fig. 7, There are large swaths in East Windsor Township that have been designated as freshwater wetlands with intermediate resource value as of 2015 (NJDEP Land use/ Land cover).

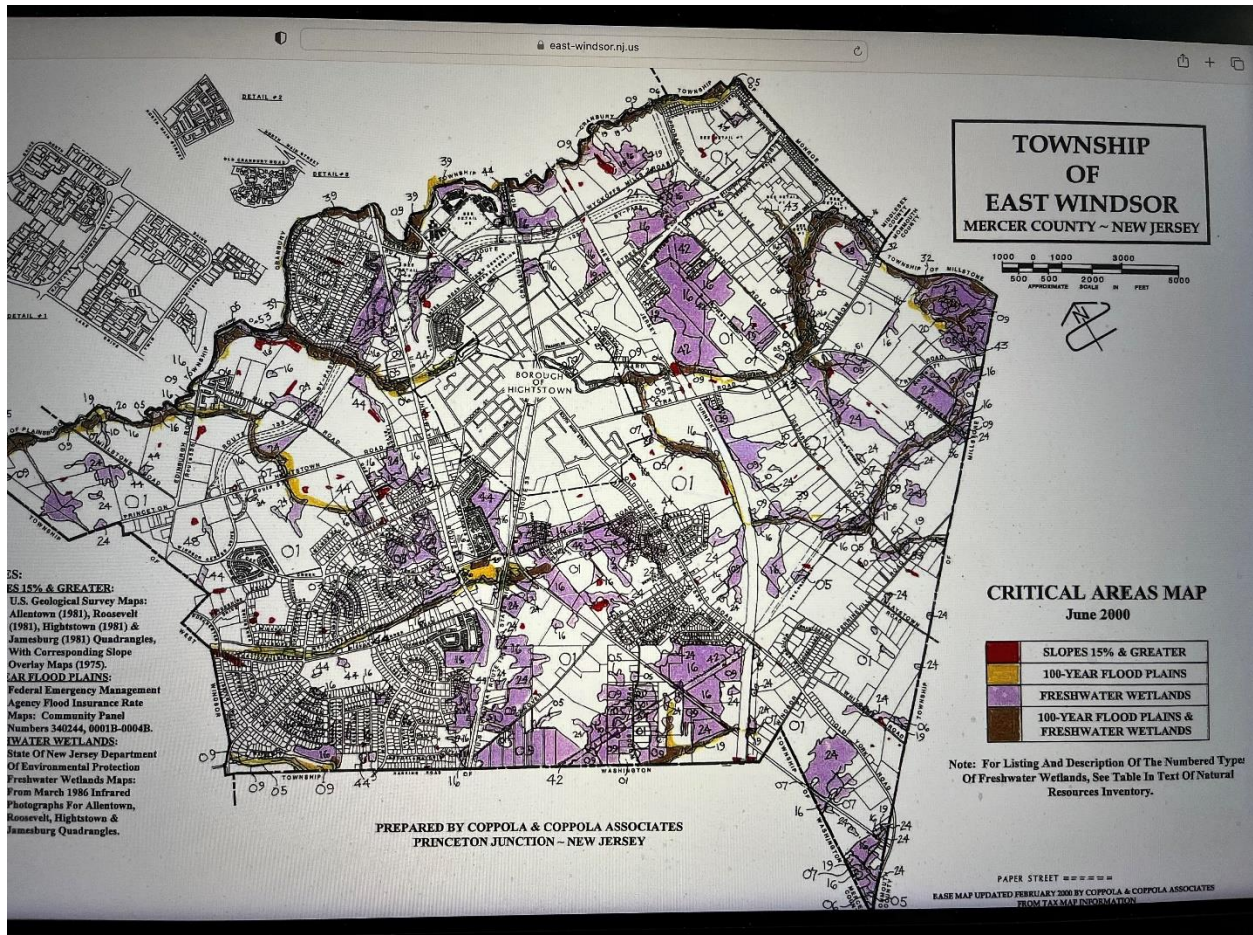


Fig. 7 - Critical Area Map of East Windsor Township (Wetlands)

These wetlands support a variety of native and invasive flora, including *Botrychium oneidense* (Bluntlobe Grapefern) and other native ferns. It is also habitat for many native faunae, and in particular, a likely habitat for the Wood Turtle – listed in 1979 as a threatened species in New Jersey.


## Section Five: Water Quality Monitoring

In 2022, the Watershed Institutes Stream Watch Chemical Action Team conducted monthly testing of nitrates, Orthophosphate concentration, pH, Turbidity, Temperature, and Dissolved Oxygen levels at a designated site on the Rocky Brook and Millstone River. In addition, the team documented habitat information such as weather, air and water temperature, algal bloom, aquatic vegetation, wildlife observations, floatable observations, water odor and color and any other relevant data.

Using the Stream Watch Water Quality Assessment Framework, water samples collected between September 2021 and September 2022, were analyzed (results average across that time shown below in fig.8 and 8a). For more information, contact the stream monitoring team.



### Upper Millstone



Water Temperature Score	3.81
Water Temperature Rating	Excellent
Nitrate Score	4.00
Nitrate Rating	Excellent
Phosphate Score	1.59
Phosphate Rating	Poor
pH Score	1.59
pH Rating	Poor
Turbidity Score	3.15
Turbidity Rating	Good
DO Score	1.94
DO Rating	Fair
E Coli Score	1.00
E Coli Rating	Poor

Fig. 8 – Upper Millstone River analysis

## Rocky Brook

Water Temperature Score	3.31
Water Temperature Rating	Excellent
Nitrate Score	4.00
Nitrate Rating	Excellent
Phosphate Score	2.17
Phosphate Rating	Fair
pH Score	3.00
pH Rating	Good
Turbidity Score	3.46
Turbidity Rating	Excellent
DO Score	4.00
DO Rating	Excellent
E Coli Score	3.37
E Coli Rating	Excellent

Fig. 8a – Rocky Brook Stream analysis

In addition, over the course of the year, the Watershed Institute Stream Watch Chemical Action Team noted sightings of insects (water strider, water skimmer, butterflies) frogs and tadpoles, Birds (Blue Jays, Robins, sparrows, turkey vultures), deer and foxes. The Watershed Institute Stream Watch Chemical Action Team also noted floating debris including leaf clumps and branches, and some plastic bottles and litter. Along the banks, the Watershed Institute Stream Watch Chemical Action Team observed a continued buildup of invasive Japanese Stilt weed.

A total Maximum Daily Load (TMDL) in East Windsor Township (Known as the Rocky Brook) is within the Millstone/Raritan Watershed area. The EPA is responsible for calculating the maximum amount of pollutant allowed in an impaired waterbody when that pollutant is discovered in the waterbody. A TMDL determines a pollutant reduction target and allocates load reductions for that pollutant source(s) in order to meet the states Water Quality Standards for public health and healthy ecosystems.

The latest report, from 2016 gives data for the total phosphorus (TP) and Total Suspended Solids (TSS) impairments in the non-tidal Raritan River Basin.

## Chapter Two: Community Access to Water

### Section One: Water Use

The East Windsor Township Public Works Department and the Environmental Commission maintains all trails and walkways that travel along all waterways and tributaries throughout East Windsor Township.

The principal community access to water within East Windsor Township is along Bear Brook (tributary). This trail is fine gravel with several foot bridges that cross the brook. There is a 3 acre pond located in the middle (Duck Pond) which allows for wildlife to visit. It is frequented daily by many of the Township residents and is open to all. A playground is located next to the pond, owned by the Township and administered by the Mayor and Council.

In addition, Trails exist through-out Etra Lake/Park, which is located on the East Windsor eastern border. This provides open public access to the Rocky Brook and Etra Lake. These trails are groomed and meander through the woods and shorelines. The lake is home to Blue gills, bass and carp, frogs, tadpoles and catfish (Fig. 9 & Fig. 10).

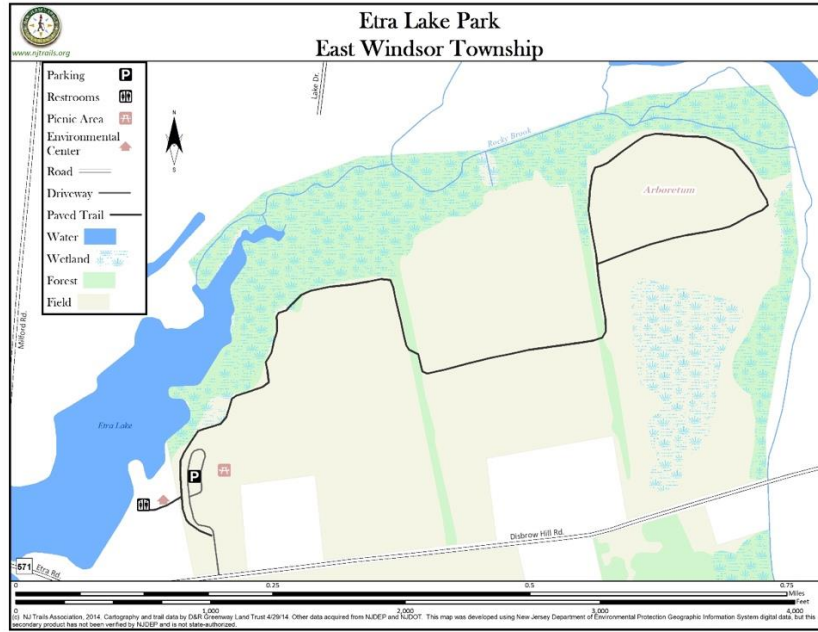


Fig. 9- Etra Lake Trail Map



Fig. 9a – Etra Lake Park Arboretum Map



Fig. 9b – Etra Lake Environmental Center

## Section Two: Recreational Fishing

East Windsor Township has recreational fishing at Etra Lake, which is fed by the Rocky Brook and along the Millstone River.

Etra Lake is home to several species of fish. There are Large Mouth Bass, Blue Gill, Carp and Catfish. There are currently no NJ Fish Consumption Advisories eating restrictions on any of these fish caught in this lake (Fig. 10). There are however restrictions on Large Mouth Bass and Blue Gill Sunfish in Peddie Lake. In addition, there are restrictions on Channel Catfish and American Eel in Lake Mercer, which is downstream from Etra Lake.



Fig. 10 – Boating and Fishing access to Etra Lake



Fig. 10a – Trail Head Markers and Exercise Stations



Fig. 10b – Access Points Throughout the shoreline & Park



### Section Three: Harmful Algal Blooms

East Windsor Township has seen no evidence of harmful Algal Blooms within Etra Lake

No Algal Blooms (HAB's) have been witnessed in Etra Lake



Fig. 10c - Etra Park

## chapter Three: Drinking Water Supply and Quality

### Section One: Public Drinking Water Supply Story

East Windsor Municipal Utilities Authority supplies drinking water to 96% of the Township. Approximately 4% is on well water.

Ninety percent of residents of East Windsor Township receive their drinking water from a publicly owned Utilities Authority. As part of the original design of the Township residential and commercial zoning, a water supply system was built in 1960 by a private company called Southern Gulf. They built two water treatment plants, Well #5 and Wells #1 and #2. Well #5 is rated at 826 gpm. Wells #1 and #2 pump a combined flow of 1,239 gpm. All East Windsor MUA's water treatment plants are iron removal.

On September 4, 1963, the East Windsor Municipal Utilities Authority was formed and incorporated by the East Windsor Township government. The water system was then purchased through the sale of bonds from Southern Gulf.

Well #5 is drilled 181 feet deep into the upper Potomac – Raritan -Magothy aquifer (unconfined), part of the Coastal Plains Aquifer system. Well #5 has a raw water iron of 2.3 mg/l. This plant utilizes aeration and filtration for iron removal.

Wells # 1 and #2 are drilled 290 feet deep into the middle Potomac – Raritan - Magothy aquifer (confined), part of the Coastal Plains Aquifer system. Well #1 and #2 have a raw water iron of .2 mg/L. Well #1 and #2 are a pump and treat type plant due to the excellent quality of water present.

As development escalated throughout the late 1960's to early 1970's, two water treatment plants were constructed to meet demand. Twin Rivers Water Treatment Plant and Well #3 (360 feet deep) and Well #7 (297 feet deep) were built. These two plants are iron removal plants. Well #6 is drilled 560 feet into the middle Potomac -Magothy– Raritan aquifer (confined), part of the Coastal Plains Aquifer system. Water quality is good/excellent. Well #6 (Twin Rivers) has a pumping capacity of 1,020 gpm. Well #3 has a pumping capacity of 450 gpm and Well #7 has a pumping capacity of 1,000 gpm and a combined flow of 1,450 gpm

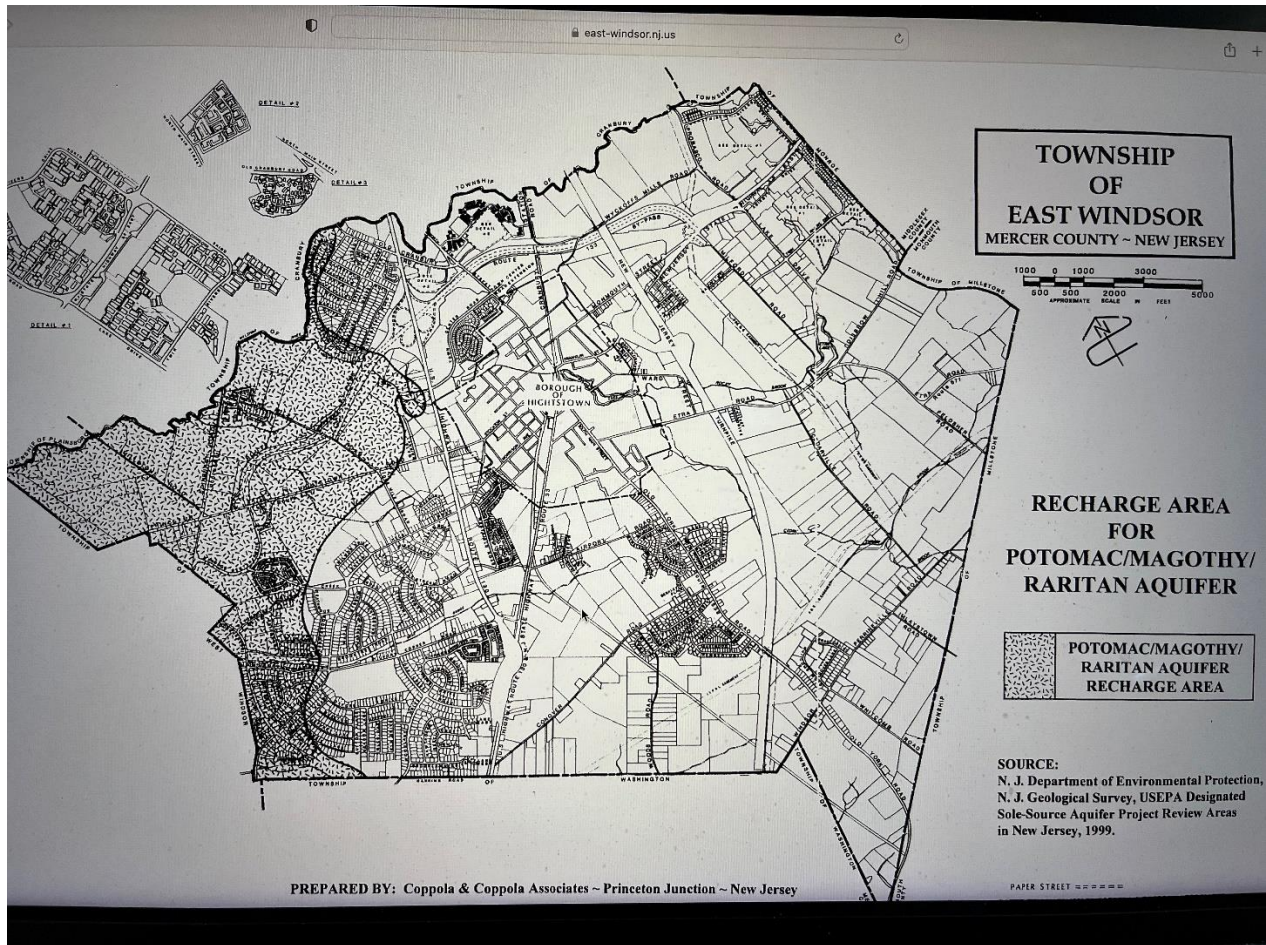


Fig. 11 - Recharge Areas in East Windsor Twp. of the Potomac Magothy Raritan Aquifer

Well Permit No.	Well Name or Designation	Subject Item ID	Pump Capacity (gpm)	Aquifer
2800053412	WELL 1	WSWL65847	682	Middle PRM
2800053411	WELL 2	WSWL65848	557	Middle PRM
2800053413	WELL 3	WSWL65869	750	Middle PRM
2800005897	WELL 5	WSWL65885	826	Upper PRM
2800007034	WELL 6	WSWL65904	1020	Middle PRM
2800013434	WELL 7	WSWL65998	1250	Middle PRM
2800042865	WELL 8	WSWL191671	1200	Middle PRM

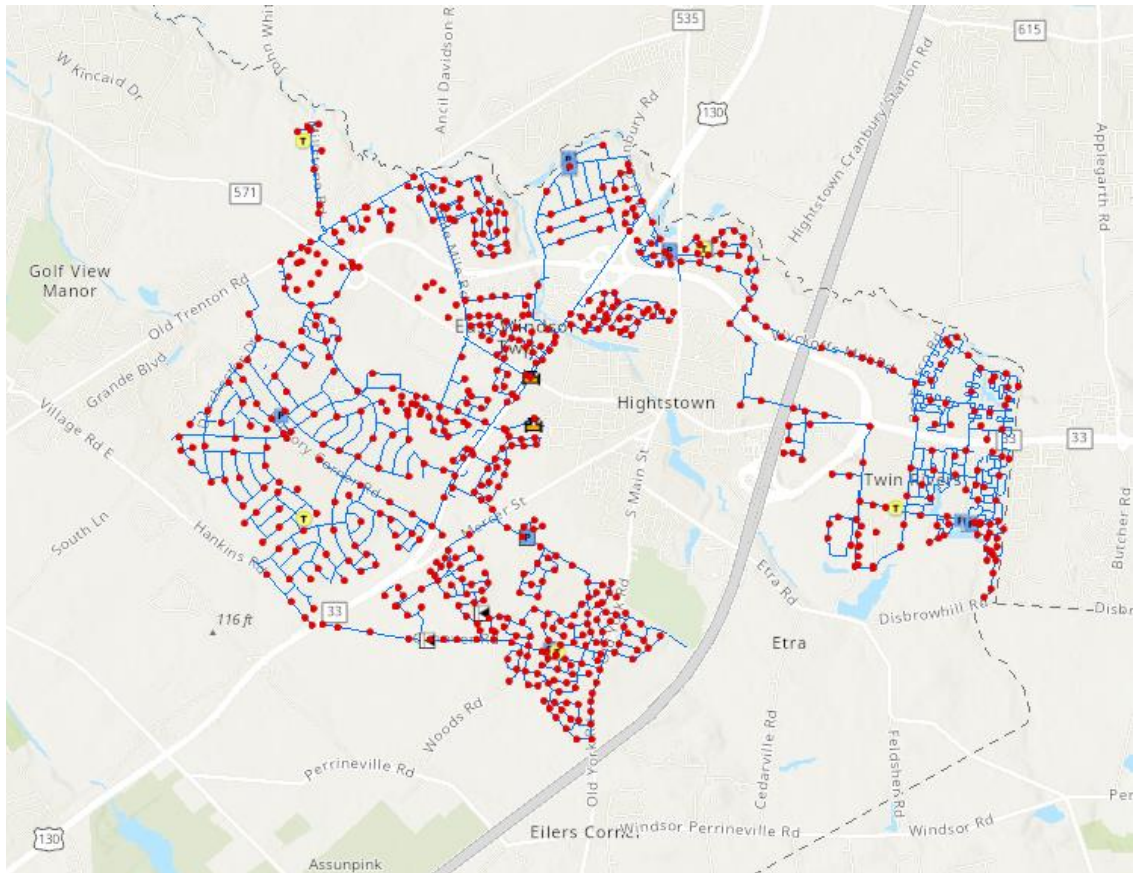


Fig. 12 - East Windsor MUA Water Infrastructure Map (GIS)

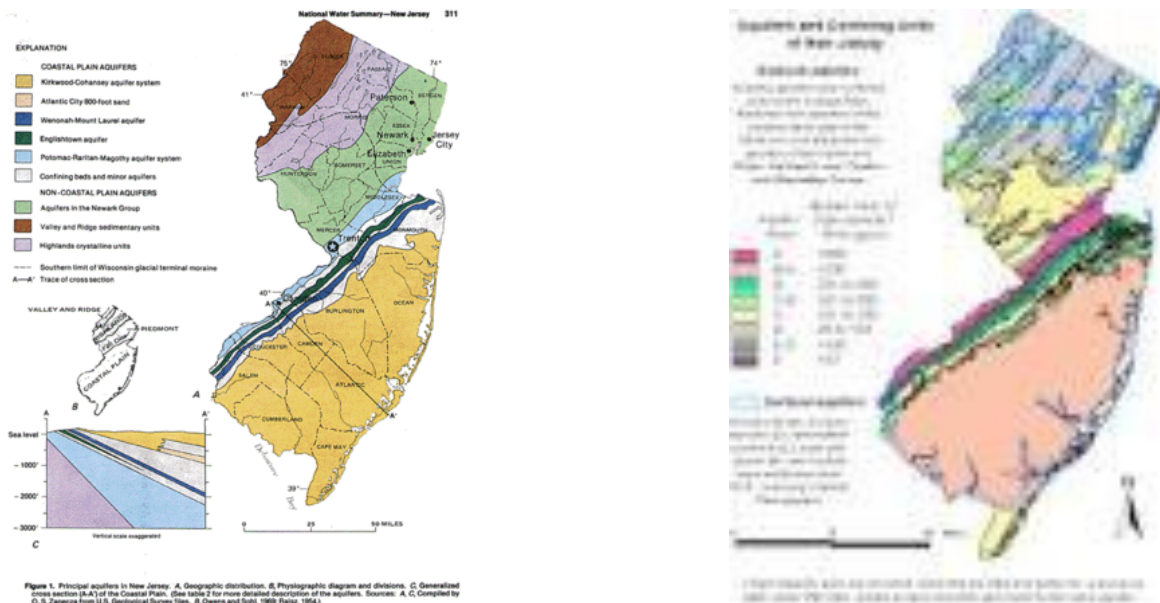


Figure 1. Principal aquifers in New Jersey. A. Geographic distribution. B. Physiographic diagram and divisions. C. Generalized cross section (A-A') of the Coastal Plain. (See table 2 for more detailed description of the aquifers. Sources: A, C, Compiled by G. S. Zapata from U.S. Geological Survey files; B, Owens and Solt, 1969; Raisz, 1954.)

Fig. 13 - Map of New Jersey Aquifers

In the late 1990's, a big development was constructed which required another treatment plant and a separate elevated storage (750,000 gallons) tank for added capacity. This plant was completed in 2000. Well #8 was drilled 456 feet deep and has a pumping capacity of 1200 gpm. It is an iron removal plant with a raw water iron of 1.5 mg/L.

Raw Water Sample		Pre- Filter Sample			Finished Water Sample			
PH	Iron	PH	Iron	Cl2	PH	Iron	Cl2	Fluoride
4.65	1.87	7.2 - 7.5	1.5	1.0 - 1.2	7.3 - 7.4	0.0 - 0.09	1.0 - 1.1	.5 - .6

Fig. 14 – Range - Water Quality Sampling Analysis (mg/l)

The most recent (2023) Annual Drinking Water Quality Report (Fig. 15) indicates that there are no violations for Barium, copper, lead (no lead service lines), nitrate, disinfectant by-products (THM's and HAA5's – Chlorine by-products). The report also gave a "low" susceptibility rating for both aquifers (upper – unconfined and the middle – confined) for pathogens, nutrients, pesticides, Volatile Organic Compounds, Inorganics, radionuclides, and Radon.

### Table of Detected Contaminants

#### Primary Regulated Substances

Contaminant	Units	MCL	MCLG	Range Detected	Highest Level	Compliance Achieved	Typical Source
<b>Inorganic Chemicals (2020) <sup>1</sup></b>							
Barium	ppm	2	2	0.018 - 0.035	0.035	Yes	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits; runoff from cropland
Fluoride <sup>2</sup>	ppm	4	4	0.42 - 0.84	0.84	Yes	Erosion of natural deposits; water additive which promotes strong teeth
Nickel	ppm	NLE	NA	ND - 0.009	0.009	Yes	Naturally occurring; industrial electroplating, stainless steel, and alloy production; runoff from mining and refining operations
Nitrate (2021)	ppm	10	10	ND - 0.49	0.49	Yes	Runoff from fertilizer use; industrial or domestic wastewater discharges; erosion of natural deposits
<b>Disinfectant Treatment Byproducts (2021)</b>							
Total Trihalomethanes (TTHMs)	ppb	LRAA = 80	NA	1.46 - 10.05	LRAA = 7.6	Yes	Byproduct of drinking water disinfection
Haloacetic Acids (HAA5s)	ppb	LRAA = 60	NA	ND - 4.20	LRAA = 2.1	Yes	Byproduct of drinking water disinfection
<b>Disinfectants (2021)</b>							
Chlorine	ppm	MRDL = 4	MRDLG = 4	0.15 - 0.96	0.64 <sup>3</sup>	Yes	Water additive used to control microbes
<b>Radiological Substances (2020) <sup>1</sup></b>							
Alpha Emitters	pCi/L	15	0	9.2	9.2 <sup>4</sup>	Yes	Erosion of natural deposits
Combined Radium 226 and 228	pCi/L	5 <sup>5</sup>	0	3.4	3.4	Yes	Erosion of natural deposits

#### Microbiological Contaminants (2021)

Contaminant	Units	MCL	MCLG	Highest Level Detected	Compliance Achieved	Typical Source
Total Coliform (TC) Bacteria	# of positive samples	TT	NA	1	Yes	Naturally present in the environment
<i>E. coli</i> (EC)		Both Routine and Repeat samples are positive	0	1 Routine and 0 Repeat samples	Yes	Human and animal fecal waste

#### Copper and Lead Study (2021)

Contaminant	Units	AL	MCLG	90th Percentile	Homes Above AL	Compliance Achieved	Typical Source
Copper	ppm	1.3	1.3	0.133	0	Yes	Corrosion of household plumbing systems
Lead	ppb	15	0	2.58	0	Yes	Corrosion of household plumbing systems

#### Secondary Contaminants (2020) <sup>1</sup>

Contaminant	Units	RUL	MCLG	Range Detected	Highest Level Detected	RUL Achieved
Iron <sup>6</sup>	ppb	300	NA	ND - 218	218	Yes
Sodium <sup>7</sup>	ppm	50	NA	1.62 - 8.49	8.49	Yes
Zinc	ppm	5	NA	ND - 0.06	0.06	Yes

Fig. 15 – 2023 Consumer Confidence Report

All households that are connected to the water system pay a fixed charge of \$20.06/quarter and \$2.19/ 1000 gallons. The average water bill is \$55.10/quarter

(5/8" meter). The fixed charge changes as the size of the meter increases, due to the larger demand put on the system.

The East Windsor Municipal Utilities Authority currently is in the planning stage to build a new water treatment plant. The East Windsor MUA currently operates five water treatment plants with a combined flow of 6.5 MGD. One plant, Well #5 is not in use due to flooding conditions (climate change). Two of the water treatment plants were built prior to 1986 when the Safe Drinking Water Act was enacted. Even though these wells produce excellent clean water, upgrades must include meeting the Safe Drinking water act. The new water treatment plant will take the place of two of the existing water treatment plants (well #5, Well #1 and #2) that are near the end of the useful life and allow for increased capacity to meet the needs of the residents for the next 60 years.

## Section Two: Lead in Drinking Water

The latest drinking water quality tests indicate that no samples exceeded the allowable level of lead

As reported in the most recent Annual Drinking Water Quality Report (2022), there are no lead contamination violations. It should be noted that the testing stops at the pipes that lead into private homes. About 50% of all homes in East Windsor Township were built after 1986, when lead solder was no longer allowed to be used. It is recommended that all residents with homes built before 1986 have their tap water tested to verify the safety and potability of their water. It is recommended to replace all old fixtures (pre - 2000) which has brass in them as lead was used in the manufacturing of the brass fixtures.

The East Windsor Municipal Utilities Authority infrastructure has no lead services or goosenecks within the system as the system was built from 1960 to present. Lead services and goosenecks were utilized in the 1930's thru the early 1950's.

East Windsor Municipal Utilities Authority has and continues to test for per- and polyfluoroalkyl substances (PFAS or "forever chemicals") in drinking water. The East Windsor Municipal Utilities Authority has sampled multiple times and has not detected it in any samples. The East Windsor Municipal Utilities Authority will be testing again in 2024.

## Section Three: Private Wells for Water Supply

A small number of residences on the southeastern and northwestern section of East Windsor Township use private wells for their water supply.

There are approximately 100 residences (1.5%) which rely on private wells for their water, most located in the southeastern section (east of the NJ Turnpike – Farm area) and Northwest section (Route 571 / Etra Road). There are approximately 12 residences on Route.539 (Old York Road), that have well water. There are several residences on Woods Road, Conover Road and Route 130 and also Route.571, west of Old Trenton Road.

Those residences which are on private wells are expected to meet the requirements for testing when selling their homes as specified in the Private Well Testing Act, N.J.S.A. 58:12A-26 et seq. (PWTA). It is recommended however that all private well owners test their wells at least once a year to ensure the water their families are drinking is safe. The East Windsor Municipal Utilities Authority offers free sampling (limited analysis – Iron, pH, Bacteriological) to all residences. The Township mission is that everyone in the community should be drinking good, clean water. All other analysis has to be sent out to a certified lab at owner’s expense. Since there is no county or state programs to assist in this, places like Home Depot, Walmart and Amazon offer for purchase home water testing kits that test for a range of contaminates (not just hardness). The East Windsor Municipal Utilities Authority does not recommend companies that try to sell treatment equipment to sample your water. It is recommended having a certified lab do testing and East Windsor Municipal Utilities Authority professionals are available to assist East Windsor Township residents throughout the process.



## Chapter Four: Wastewater

### Section One: Wastewater Facilities

The East Windsor Municipal Utility Authority owns and operates a 5 million gallon a day (5 MGD) biological tertiary treatment plant (Pollution Control Facility), located on the northwestern section of the Township, next to the Millstone River.

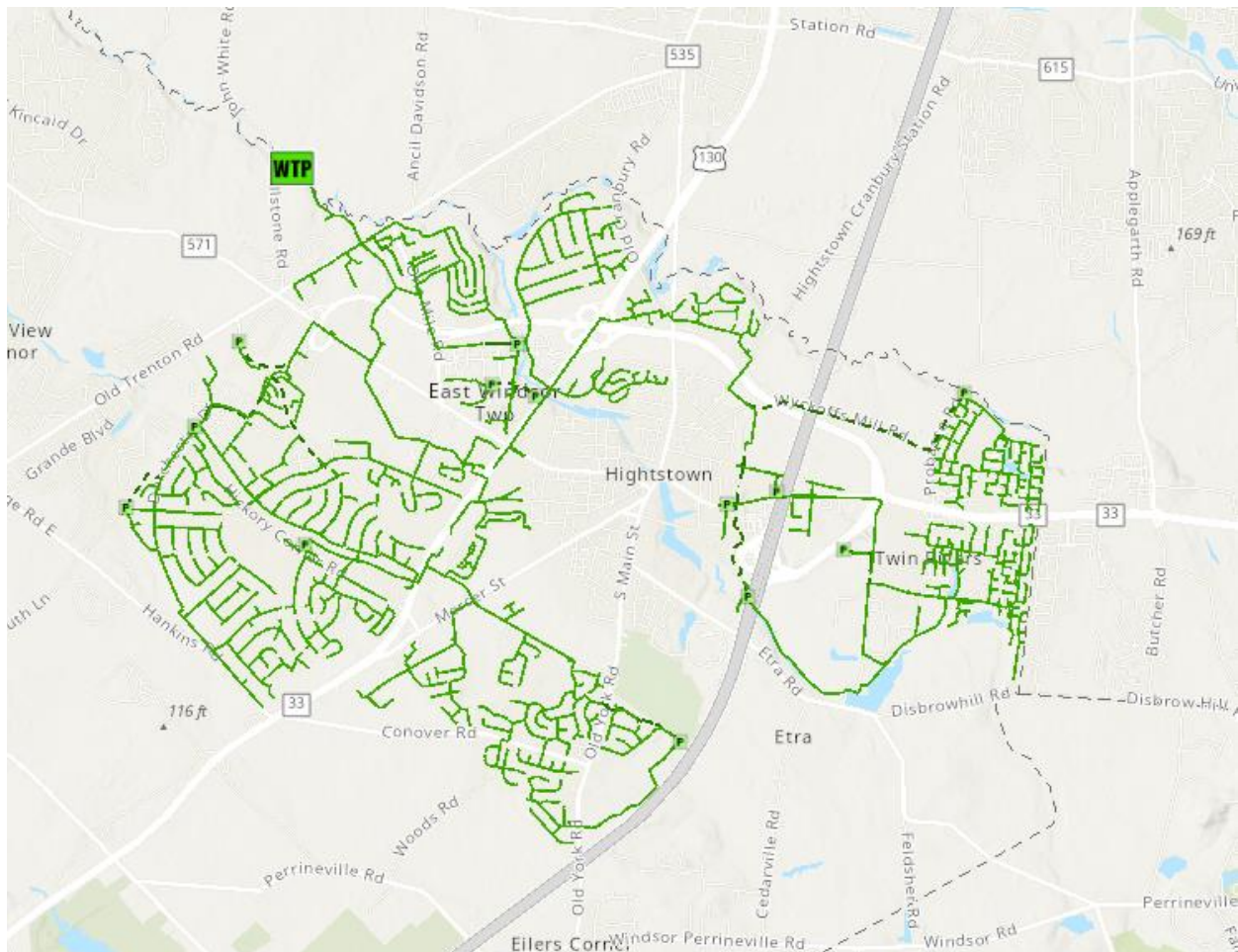


Fig. 16 - East Windsor MUA Conveyance System Map (GIS)

As with the drinking water service, the wastewater treatment facility is used by approximately 98% of East Windsor Township residents. The remaining 2% of residents and farms are in the south to south-eastern section, and pockets along Route 539, Route 571, Woods Road and Conover Road and Route 130 are on septic systems. The East Windsor Municipal Utilities Authority is in the planning stage to extend the sewer conveyance system to some of these areas where it will be accessible.

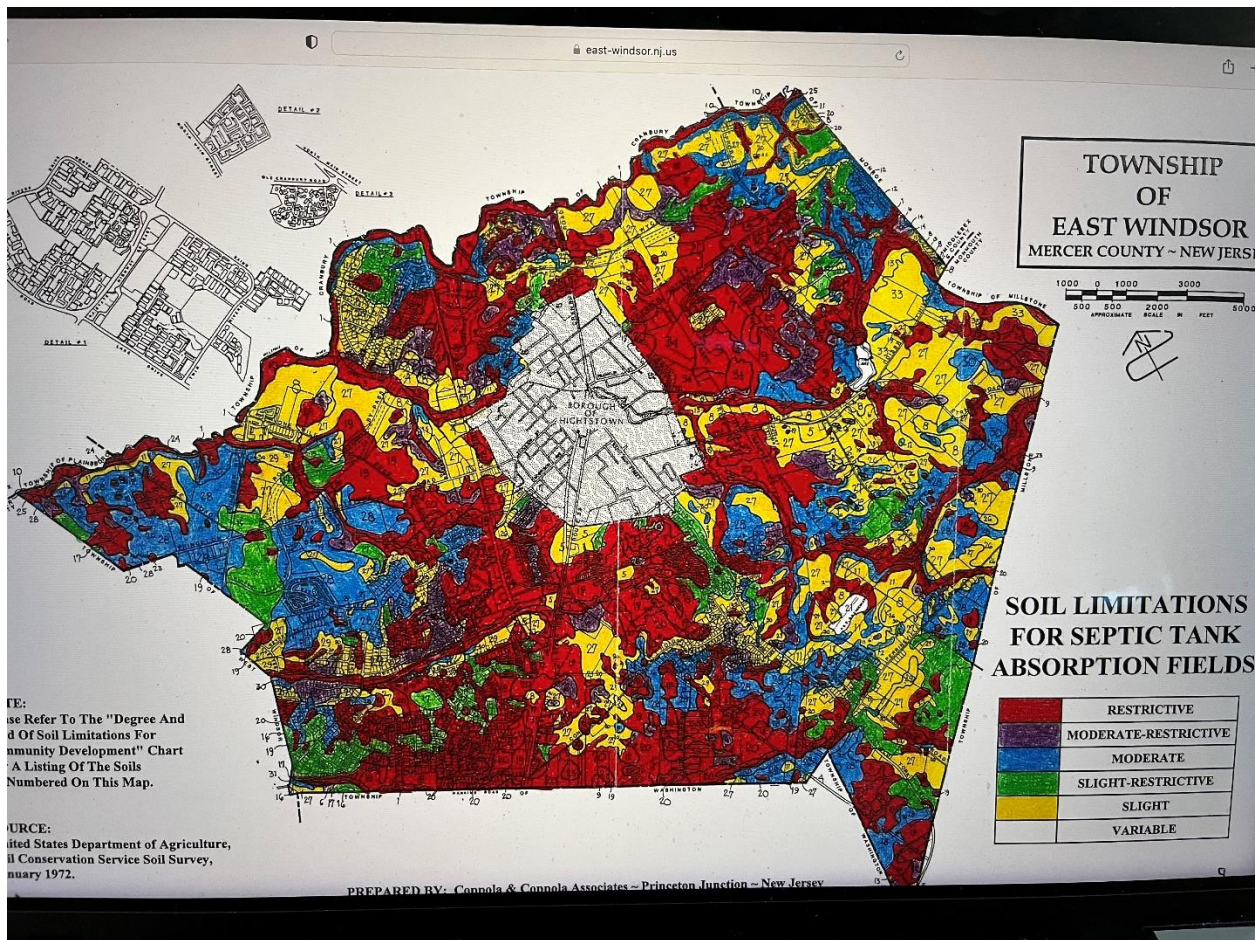


Fig. 17 - Soil Limitations for Septic Tank Absorption Fields

Suitable areas for septic disposal require a soil that has enough, but not excessive, drainage, in other words, soils that can adequately absorb the effluent, yet sufficiently filter the effluent to prevent groundwater contamination. Therefore, there must be unsaturated soil material beneath the absorption field to filter the effluent effectively.

Criteria used in rating of the soils are percolation rate, depth to seasonal high-water table, slope, amount of stone, depth to and kind of bedrock, and flood hazard.

The “Soil Limitations for Septic Tank Absorption fields” map graphically indicates the location and ranking of the soil in East Windsor Township suitable for septic disposal. Again, it should be noted and clearly understood that the mapped information does not take the place of onsite investigation.

In 2010, East Windsor Municipal Utilities Authority embarked on a major upgrade to its facilities. This was a \$20 million dollar project that was funded by the State Revolving Fund (SRF currently called the N.J. I Bank). Low interest loans and some principal forgiveness through the NJDEP were utilized (Fig. 18 – 21).

High efficiency blowers were installed to enhance the biological treatment in the aeration basing. Two additional clarifiers were installed to help remove small particles (suspended solids) more efficiently and Ultra Violet disinfectant equipment (replaced sodium hypochlorite system) installed to remove all bacteria from the effluent. The tertiary sand filters were retrofit and an additional filter bed was installed. This has not only reduced East Windsor MUA’s operating cost; it has also enhanced the Millstone Rivers water quality immensely.

East Windsor Municipal Utilities Authority discharge from the Pollution Control Facility has always been far below what is allowed through our NJPDES permit. We have just completed a pilot study on reducing our phosphorus levels even further. We have a project designated through the N.J. I Bank on replacing our tertiary sand filters with Rotating Disc Filters. Our pilot study has shown us that we can reduce our phosphorus levels by an additional 10%, along with Total Suspended Solids (TSS). The Rotating Disc Filters will reduce our water use for backwashing by 60%. Maintenance cost will also be reduced by another 45%. Use of chemicals to treat for Phosphorus will also be reduced for additional savings and better water quality discharge.



Fig. 18 – 2010 Infrastructure Project



Fig. 19 – 2010 Infrastructure Project - Clarifiers



Fig. 20 – 2010 Infrastructure Project – Tertiary Filters



Fig. 20a – 2010 Infrastructure Project – Tertiary Filters



Fig. 21 – 2010 Infrastructure Project – U. V. Désinfectant

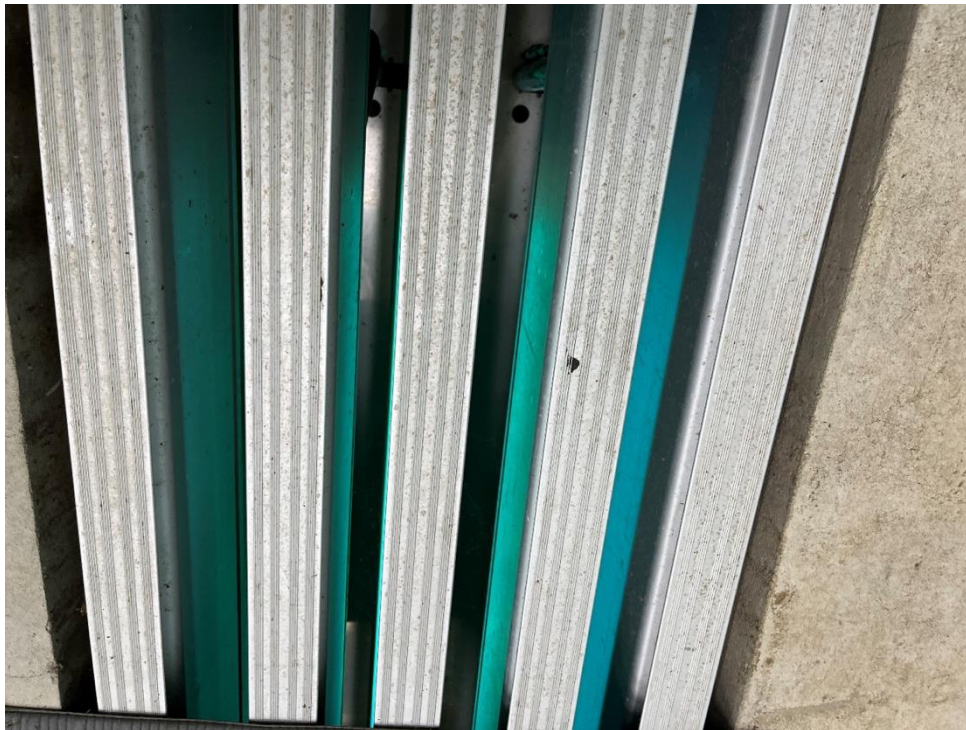


Fig. 21a – 2010 Infrastructure Project – U. V. Disinfectant



Fig. 22 – 1.7 Mega Watt Solar Field

In 2018, the East Windsor Municipal Utilities Authority, with the assistance from the Township Mayor and Council, embarked on a significant solar project to help reduce the carbon footprint while decreasing electrical costs. A 1.7-megawatt solar field was built at no cost to the ratepayers. This solar field supplies 90% of all power to the wastewater plant. The East Windsor Municipal Utilities Authority is currently replacing (through the agency's asset management plan) low efficiency motors with high efficiency premium motors with variable frequency drives (VFD's) to lower the carbon footprint further and achieve a 100% solar powered wastewater treatment facility.

## Section Two: Combined Sewer Overflows System

East Windsor Municipal Utilities Authority does not have a CSO System

The East Windsor Municipal Utilities Authority does not have a Combined Sewer Overflow System, but instead has a separate storm sewer system (MS4) that is owned and operated by the Township.

## Section Three: Septic System

A small number (2 %) of residences on the southeastern and northwestern section of East Windsor Township use septic systems for their wastewater

As above in Section One, Chapter Three, There are approximately 100 residences (2 %) which rely on their own septic system, most in the farming area of the Township.

## Section Four: Discharges to Water

East Windsor Municipal Utilities Authority Pollution Control (wastewater treatment) Facility is a regulated discharge site.

The East Windsor Municipal Utilities Authority wastewater treatment facility is regulated by the New Jersey Pollutant Discharge Elimination System (NJPDES permit, ID number NJ0023787. East Windsor Municipal Utilities Authority wastewater treatment plant discharges in to the Millstone River. The NJPDES Surface Water Renewal Permit is effective 1/1/2020 through 3/31/2025, as required and reported in the latest NJDEP Standard Compliance Inspection.





Fig. 23 – East Windsor MUA NJPDES Permit – Outfall Pipe

## Chapter Five: Storm Water and Flooding

### Section One: Township Storm Water Management

East Windsor Township is a MS4 Municipal Separate Storm Sewer System

Stormwater management is the process of controlling the negative impacts to stormwater runoff resulting from land use changes, and most frequently those caused by land development. A significant contributor to poor water quality and flooding is inadequate management of polluted stormwater runoff. The goal of the municipal stormwater ordinance is to protect and improve water quality while mitigating flooding for public health, safety and welfare of the community.

Human activities are largely responsible for the pollution found in our stormwater runoff. The EPA has cited urban stormwater as the largest contributor of pollutants to our waterways. Everything that we put on the ground or into the storm drain can end up in our streams and ponds. Each of us has a responsibility to make sure contaminants stay out of our waters. “Be the solution to runoff pollution.”

As a suburban residential development with open space and large tracts of farmland, East Windsor Township is classified for a Tier B MS4 permit from the NJDEP. The designated Township Stormwater Coordinator is the Township Manager.

East Windsor Township stormwater management plan can be found within the Township Ordinance, Chapter 22 Technical Standards for the Construction of Improvements and parts of Chapter 15.

## Section Two: Flooding Concerns

As an inland Township, East Windsor Township is subject to riverine (fluvial non-tidal) flooding caused by stormwater runoff from severe rainfalls and snowmelts.

FEMA flood maps identify Zone A flood areas surrounding the Bear Brook, Rocky Brook, and the Upper Millstone River basin. These waterways have several tributaries. These areas indicate “Special Flood Hazard” zones that have a 1% or greater annual chance of equaling or exceeding the Base Flood Elevation (BFE) of surface water. However, as noted in the NJDEP proposed “Flood Hazard Area” (FHA) Standards, these maps are based on historical data which cannot take factors like climate change or the increase of impervious surfaces into account. Additionally, East Windsor Township is bordered by higher elevation areas on the north and east, causing the Township to become a natural low-elevation basin for run-off from these areas.

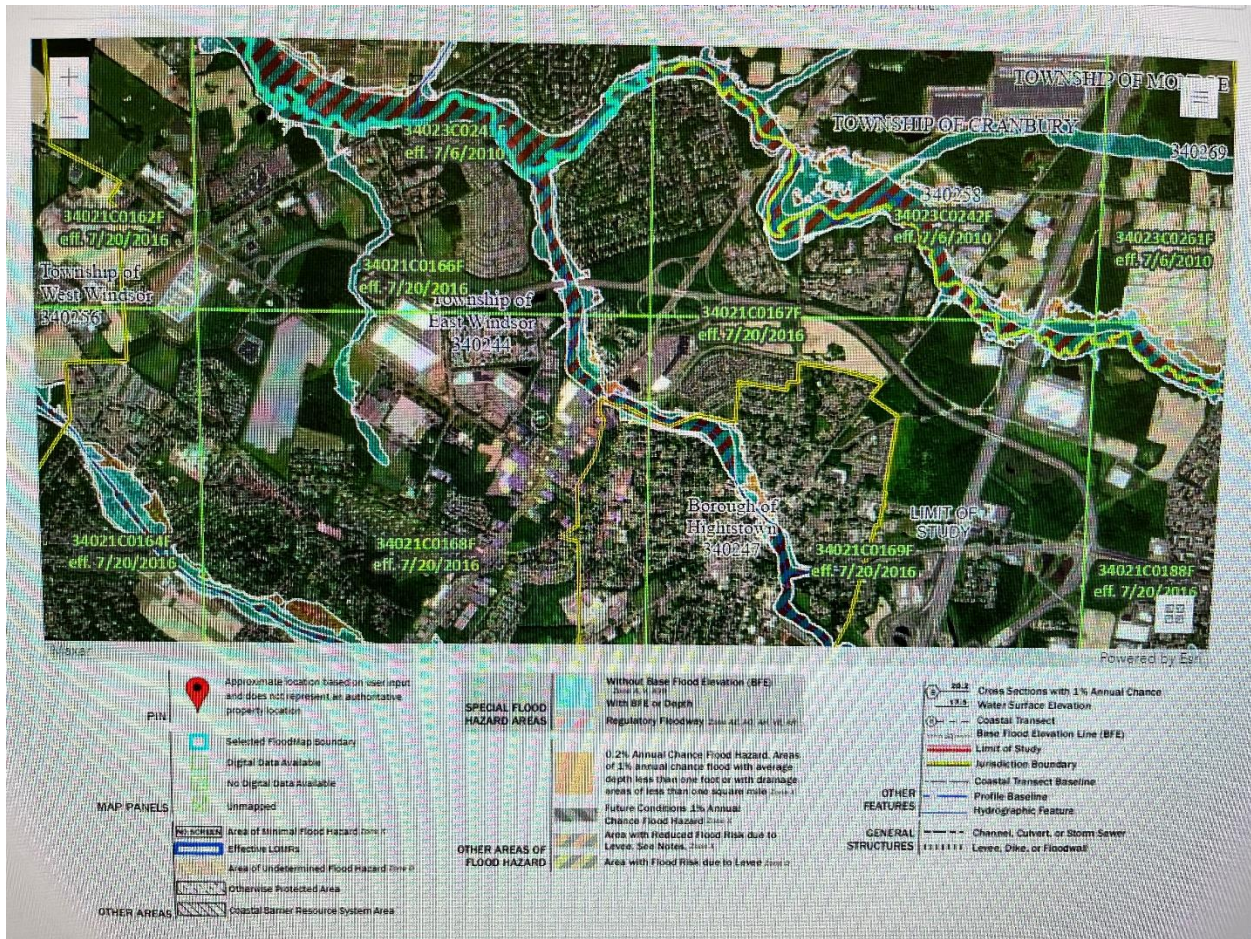


Fig. 24 FEMA Base Flood Elevation (BFE) Map