

Township of Nutley

Municipal Stormwater Management Plan

Sub-Element to Nutley Master Plan



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Links

Township of Nutley Stormwater Control Ordinance: <https://ecode360.com/12134713>

Township of Nutley Flood Hazard Area: <https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd>

Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Township of Nutley to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as

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

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

These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

Goals

The goals of this MSWMP are to:

1. Reduce flood damage, including damage to life and property;

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance along with the NJRSIS will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing flooding impacts. This is accomplished through flow and suspended solids reduction to watercourses and stormwater conveyance systems.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations. The applicant will be required to submit a drainage report including a flooding analysis to ensure conformance.

2. Minimize, to the extent practical, any increase in stormwater runoff from any new development;

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance along with the NJRSIS will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing stormwater runoff quantities from new development.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations. The applicant will be required to submit a drainage report including a flooding analysis to ensure conformance.

3. Reduce soil erosion from any development or construction project;

This is to occur through the implementation of the New Jersey's Soil Erosion and Sediment Control Standards requirements. This Plan is to be consistent with those Standards. The requirements are also included within the Stormwater Control Ordinance.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified Soil Erosion and Sediment Control Standards. In addition, projects with limit of disturbance of five thousand square feet or greater must obtain a Soil Erosion and Sediment Control Permit from the Hudson-Essex-Passaic Soil Conservation District.

4. Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance along with the NJRSIS will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing flow and suspend solids which affect flow channels through culverts and bridges. In addition, inadequate culverts that were constructed prior to the Stormwater Control Ordinance may be updated through the Mitigation Plan section.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations. The applicant will be required to submit a drainage report including a flooding analysis to ensure conformance.

5. Maintain groundwater recharge;

This is to occur through flue adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). Groundwater recharge and quality requirements for all major development will be governed through the adoption of this ordinance.

Groundwater recharge requirements are to be satisfied through the implementation of design measures to maintain existing groundwater recharge rate and quantity prior to development. Groundwater quality is to be maintained through the implementation of Best Management Practices (Nonstructural and Structural Strategies) to remove constituents and pollutants prior to infiltration / recharge to groundwater.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations.

6. Prevent, to the greatest extent feasible, an increase in nonpoint pollution;

This is to occur through the adoption of a series of ordinance which include a pet waste and wildlife feeding ordinance.

7. Maintain the integrity of stream channels for their biological functions, as well as for drainage;

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing pollutants within the flow which affect biological function and drainage conveyance ability of stream channels.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations.

8. Minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water;

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). This ordinance will govern stormwater quantity, stormwater quality, and groundwater recharge thereby reducing pollutants. In addition, the adoption of a series of ordinances which include a pet waste and wildlife feeding ordinance will reduce pollutants within stormwater runoff.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations.

9. Protect public safety through the proper design and operation of stormwater basins.

This is to occur through the adoption of the Stormwater Control Ordinance and the existing stormwater regulations within the New Jersey Residential Site Improvement Standards (NJRSIS). A section within the adopted ordinance will address safety standards for stormwater management basins.

All submitted site plans and subdivision plans which are governed by this ordinance and / or the NJRSIS will be reviewed by the municipal and board engineer for conformance with the specified stormwater regulations. The applicant will be required to submit a drainage report including a flooding analysis to ensure conformance.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

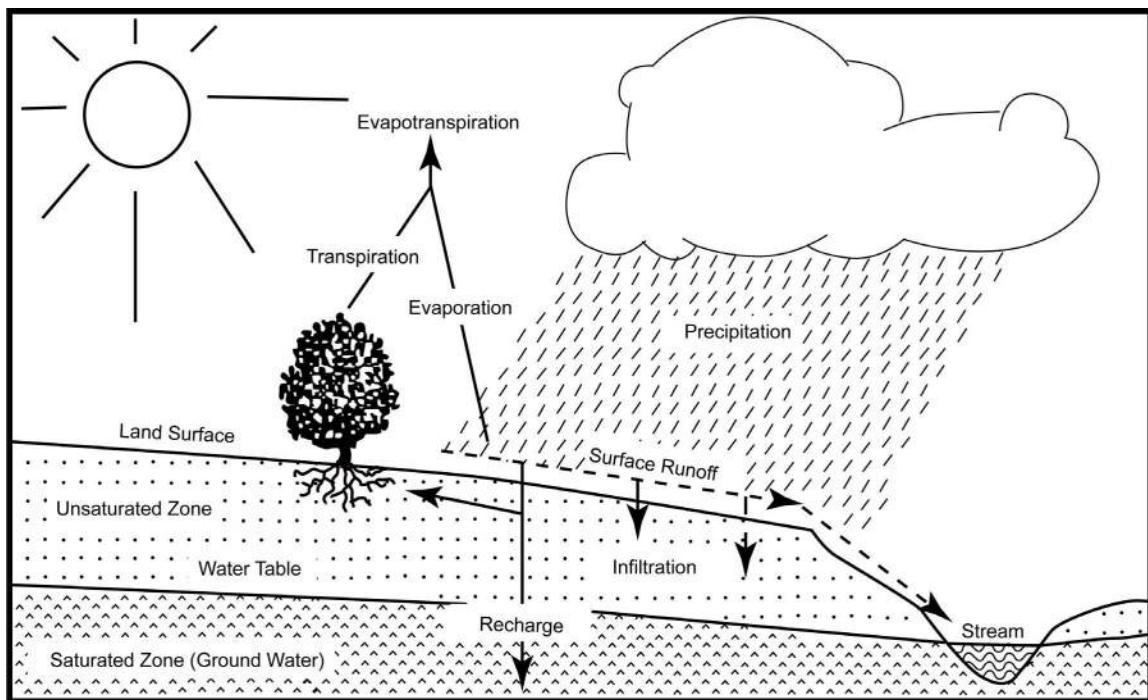
Stormwater Discussion

Land development in Nutley can dramatically alter the hydrologic cycle (See Figure C-1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall.

Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream.

Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

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

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

Background

The Township of Nutley is located along the Garden State Parkway in the northeastern corner of Essex County, New Jersey. It is composed of 3.38 square miles and is an urban community containing residential, commercial, municipal and light industrial properties. Most of the township's development took place prior to 1980, and today is nearly fully developed, with an estimated 148 of 9203 parcels being classified as vacant parcels. The 2022 population was determined to be 29,565 residents. Figure C-3 provides a graphic illustration of the Township on the USGS quadrangle map.

The Passaic River flows southerly along the eastern boundary of the township. The Third River, a tributary of the Passaic River, flows northeasterly through the central portions of the township. St. Paul's Brook, a tributary of the Third River, flows easterly through the northwestern portions of the Township. A map of the Township's waterways is provided as Figure 3.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs. There are currently no TMDLs issued for sections of the waterbodies located within the township of Nutley.

The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d))

(Integrated List) is required by the federal Clean Water Act to be prepared biennially by the NJDEP and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards and identifies waters that are impaired. Sublist 4 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed. According to this data, the Third River and Passaic Rivers are impaired. Both Third River and Passaic Rivers are included on the 303(d) List and Passaic River is included on Sublist 4.

In addition to water quality problems, the Township of Nutley has exhibited water quantity problems. The Township has experienced flooding along the Passaic River, Third River, and St. Paul's Brook that flow through the Township. Approximately 372 acres (17%) of the Township lies in a flood hazard area and is prone to flooding. The flooding is also caused by stormwater runoff being collected from various upstream municipalities, such as Woodland Park, Little Falls, Montclair, Bloomfield, Belleville, Nutley, and Clifton. Nutley is located in the downstream region of these municipalities and the flow from the township ultimately discharges into the Passaic River. The Township has limited control of the stormwater runoff being received from the upstream municipalities. Due to lower terrain, proximity to existing rivers and increasing development, the Township of Nutley has observed flooding and damage during short duration high intensity storms and major storm events.

Wellhead protection areas, also a required aspect of the MSWMP, are shown in Figure C-5. It should be noted that a groundwater recharge map, another required aspect of the MSWMP, is not included as part of this plan due to the lack of soil survey information for Essex County. The MSWMP will be amended to include a groundwater recharge map as soon as soil surveys for Essex County are completed and groundwater recharge areas are determined by the NJDEP.

Design and Performance Standards

The Township of Nutley will adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The revised ordinance was submitted to the county for review and approval and has been implemented and is now in effect.

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

Plan Consistency

The Township of Nutley is not within a Regional Stormwater Management Planning Area; therefore, this plan does not need to be consistent with any regional stormwater management plans (RSWMPs). If any RSWMPs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

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

The Township's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Township inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

Nonstructural Stormwater Management Strategies

The Township of Nutley has reviewed the master plan and ordinances, and has provided a list of the sections in the Township land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. These are the ordinances identified for revision. Once the ordinance texts are completed, they will be submitted to the county review agency for review and approval within [24 months of the effective date of the Stormwater Management Rules]. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapters 600 and 700 of the Township Code, entitled Site Plan Review and Zoning respectively, were reviewed with regard to incorporating nonstructural stormwater management strategies. Several changes to the articles of these chapters are being considered to incorporate these strategies.

§700-3. Definition — Parking Space.

This section currently requires that off-street parking spaces have minimum dimensions of 9 feet by 18 feet. This section may be amended to allow for parking spaces with smaller dimensions to reduce the area of impervious surfaces installed in the parking areas.

§700-29 Buffer requirements.

These sections discuss requirements for off street parking lots. These sections currently require any parking lot abutting a street or adjoining a residential use to have buffering along the affected property line to minimize headlight glare, noise and to shield activities from adjacent properties. The buffering may consist of evergreens, shrubs, bushes or deciduous trees, or combinations thereof, to achieve the stated objectives.

These sections may be amended to encourage the usage of native vegetation, which requires less fertilization and watering than non-native species.

§700-97 Parking Lot Landscaping.

This section discusses requirements of landscaping of parking lots over 20,000 square feet. This section currently requires that 5% of the area within the parking area be devoted to landscaping, including shade trees. This section may be amended to encourage the usage of native vegetation, which requires less fertilization and watering than non-native Species.

§700-31. General Development Plan; Contents.

This section discusses requirements for planned residential development in the P.R.D. Zone. This section currently requires that a development plan be submitted for properties which are the subject of a development application. As part of the development plan, the applicant is required to submit a stormwater management plan setting forth the proposed method of controlling and the management of stormwater on the site.

This section may be amended to encourage developers to design sidewalks to drain runoff into landscaped areas or to use permeable paving surfaces where appropriate. It also may be amended to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious surfaces.

§700-98 Buffer for Parking Areas.

This section discusses buffer requirements for certain conditional use properties which abut a residential zone or use. This section currently requires that buffers include densely planted evergreens at least six feet high at planted.

This section may be amended to encourage the usage of native vegetation, which requires less fertilization and watering than non-native species.

§700-108 Equipment Compounds.

This section discusses buffer requirements for wireless telecommunication facilities. This section currently requires these buffers utilizing native evergreen and deciduous trees. This requirement constitutes a nonstructural stormwater management strategy since native vegetation requires less fertilization and watering than non-native species.

§630-25. Construction Specifications.

These sections may be amended to allow for flush curb with curb stop or curbing with curb cuts to encourage developers to allow for the discharge of impervious areas into the landscaped areas for stormwater management. Also, it may be amended to promote the use of natural vegetated swales, and to allow pervious paving to be used to provide overflow parking, vertical parking structures and smaller parking stalls.

§ 622-4 Stormwater management requirements for major developments.

This section may be amended to incorporate all requirements outlined in N.J.A.C. 7:8—5. It may also be amended to encourage the use of green infrastructure measures in lieu of inlets and pipes.

§ 630-17. Required improvements.

This section addresses required improvements associated with projects involving the subdivision of land. The existing regulation requires the developer to install curbs and sidewalks.

This section may be amended to encourage developers to design sidewalks to drain runoff into landscaped areas or to use permeable paving surfaces where appropriate. It also may be amended to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious surfaces.

§ 630-18. Off-Tract Improvements.

This section may be amended to require that any off-site and off-tract stormwater management and drainage improvements must conform to the “Design and Performance Standards” as described in this plan.

The portion of the Code of Nutley Township, regarding lot size and maximum percent impervious surface, will be reviewed. Nutley will evaluate the maximum allowable impervious cover for each zone to determine whether a reduction in impervious cover is appropriate. The Code may be amended to specify the maximum site disturbance limits for each zoning district. Also, the Code may be amended to remind developers that satisfying the percent impervious requirements does not relieve them of responsibility for complying with the Design and Performance Standards for Stormwater Management Measures.

The territory of the Township of Nutley is hereby divided into the following 16 classes of zoning districts:

- R-1 : Residential 1 Family
- R-1A : Residential 1 Family
- R-1AA: Residential 1 Family
- R-2: Residential 2 Family
- R-3: Garden Apartments
- R-SC: Residential Senior Citizen
- B-1: Professional & Business Offices & Research Labs
- B-2: Neighborhood Business
- B-3 Downtown Business
- B-3A: Downtown Business
- B-4: General Business
- M: Manufacturing
- M-O: Industry and Office
- M-1: Industry and Garden Apartment Groups
- M-2: Industry
- P: Parks
- PRD: Proposed Residential Development

Each district has a maximum percent impervious surface allocation. The Township is evaluating the maximum allowable impervious cover for each zone to determine whether a reduction in impervious cover is appropriate. The Township is also evaluating a maximum percent of disturbance for each zone. Also, if a developer is given a variance to exceed the maximum allowable percent imperviousness, the developer must mitigate the impact of the additional impervious surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge as described in Chapter 622. A detailed description of how to develop a mitigation plan is included in this Municipal Stormwater Management Plan.

Land Use/Build-Out Analysis

The Township of Nutley is composed of 3.77 square miles and contains 9203 parcels of land. Based upon 2024 tax assessment records, 148 of these parcels were classified as vacant, while none were classified as agricultural. It has been determined that the cumulative area of the vacant parcels is less than 1 square mile. As a result, this MSWMP is not required to include a build-out analysis. Refer to Figure C-6 for an illustration of land use within the Township, which is based upon 1995 data supplied from NJDEP Office of Information Resources Management, Bureau of Geographic Information and Analysis. Figure C-7 illustrates the HUC14s within the Township. The Township zoning map is shown in Figure C-8. Figure C-9 illustrates the wetlands and water land uses within the Township.

Mitigation Plans

This mitigation plan is provided for a proposed development that is granted a variance or exemption from the stormwater management design and performance standards. Presented is a hierarchy of options.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

a. The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the projects can be obtained from the Township Engineer. Listed below are specific projects that can be used to address the mitigation requirement for the referenced drainage area.

Third River Drainage Area (HUC02030103150010)

Groundwater Recharge

- Retrofit existing parking lot(s) within the control of the Township of Nutley to provide additional groundwater recharge. The retrofitted BMP must be installed underground or in such a manner as to not reduce the number of parking spaces.
- Construct bio-retention basins within Township ROW.

Water Quality

- Install and/or retrofit stormwater management facilities to provide the removal of 80 percent of total suspended solids.
- Retrofit the existing municipal parking area(s) to provide the removal of 80 percent of total suspended solids. Due to site constraints, the retrofitted BMP must be installed underground and cannot reduce the existing number of parking spaces.
- The installation of grass strips along sidewalks to maximize infiltration and control stormwater runoff. The locations shall be coordinated with the Township of Nutley.
 - Enhance vegetative buffer within the “stream corridor.”
 - Investigate and remove invasive plant species within riparian corridors, targeted wetland areas and stream corridors and replant with native species. If no invasive plants species exist, this measure is not applicable.

Water Quantity

- Install stormwater management measures in open space to reduce the peak flow from the upstream development on the receiving stream by 20 cfs, 35 cfs, and 100 cfs for the 2, 10, and 100-year storms respectively.
- Coordinate with Essex County and the Township of Nutley to construct an upstream retention area to partially detain and store water to reduce the downstream impact along Bloomfield

Avenue and Kingsland Road. We further recommend obtaining stormwater management system easements and coordination with the upstream private property owners for the construction of green infrastructure measures and stormwater management basins that can reduce the peak rate of runoff reaching the culvert at Bloomfield Avenue and Kingsland Street.

- Installation of underground ADS chambers within Township ROW/Easements for additional detention of water. The locations shall be coordinated with the Township of Nutley.
- Construction of a new outlet control structure within the Nichols Park basin to regulate flows through the basin and to reduce downstream impact. Design of new outlet structure shall be coordinated with Township of Nutley Engineer.
 - Coordinate with Township to increase the existing stormwater system capacity.
- Modifying the existing depression to function as a detention basin will mitigate the downstream impact of flooding.
- Construction of an additional basin at Booth Park to detain flow within the park before it reaches the Third River. This will reduce the volume of water that the Third River receives all at once and is intended to minimize the impact directly on the Third River for higher duration smaller intensity storms.

General

- Determine the dollar value of noncompliance onsite and contribute that amount into a trust fund for updating Municipal Stormwater Management Plan
- Increasing Third River flow through the Passaic Avenue bridge at Rutgers.
- Hydrologic calculations to demonstrate peak rate of runoff at outfalls.

Passaic River Drainage Area (HUC02030103010130)

Groundwater Recharge

- Retrofit existing parking lot(s) within the control of the Township of Nutley to provide additional groundwater recharge. The retrofitted BMP must be installed underground or in such a manner as to not reduce the number of parking spaces.
- Construct bio-retention basins within Township ROW.

Water Quality

- Install and/or retrofit stormwater management facilities to provide the removal of 80 percent of total suspended solids.
- Retrofit the existing municipal parking area(s) to provide the removal of 80 percent of total suspended solids. Due to site constraints, the retrofitted BMP must be installed underground and cannot reduce the existing number of parking spaces.
- The installation of grass strips along sidewalks to maximize infiltration and control stormwater runoff. The locations shall be coordinated with the Township of Nutley.
 - Enhance vegetative buffer within the “stream corridor.”
 - Investigate and remove invasive plant species within riparian corridors, targeted wetland areas and stream corridors and replant with native species. If no invasive plants species exist, this measure is not applicable.

Water Quantity

- Install stormwater management measures in open space to reduce the peak flow from the upstream development on the receiving stream by 20 cfs, 35 cfs, and 100 cfs for the 2, 10, and 100-year storms respectively.
- Coordinate with Essex County and the Township of Nutley to construct an upstream retention area to partially detain and store water to reduce the downstream impact along Bloomfield Avenue and Kingsland Road. We further recommend obtaining stormwater management system easements and coordination with the upstream private property owners for the construction of green infrastructure measures and stormwater management basins that can reduce the peak rate of runoff reaching the culvert at Bloomfield Avenue and Kingsland Street.
- Installation of underground ADS chambers within Township ROW/Easements for additional detention of water. The locations shall be coordinated with the Township of Nutley.
- Construction of a new outlet control structure within the Nichols Park basin to regulate flows through the basin and to reduce downstream impact. Design of new outlet structure shall be coordinated with Township of Nutley Engineer.
 - Coordinate with Township to increase the existing stormwater system capacity.
- Modifying the existing depression to function as a detention basin will mitigate the downstream impact of flooding.
- Construction of an additional basin at Booth Park to detain flow within the park before it reaches the Third River. This will reduce the volume of water that the Third River receives all at once and is intended to minimize the impact directly on the Third River for higher duration smaller intensity storms.

General

- Determine the dollar value of noncompliance onsite and contribute that amount into a trust fund for updating Municipal Stormwater Management Plan.

2. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment. Listed below are specific projects that can be used to address the mitigation option.

Water Quality

- Re-establish a vegetative buffer (minimum 50 foot wide) as a goose control measure and to filter stormwater runoff from the high goose traffic areas.
- Provide goose management measures, including public education at a local park.

The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Management Plan. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure.

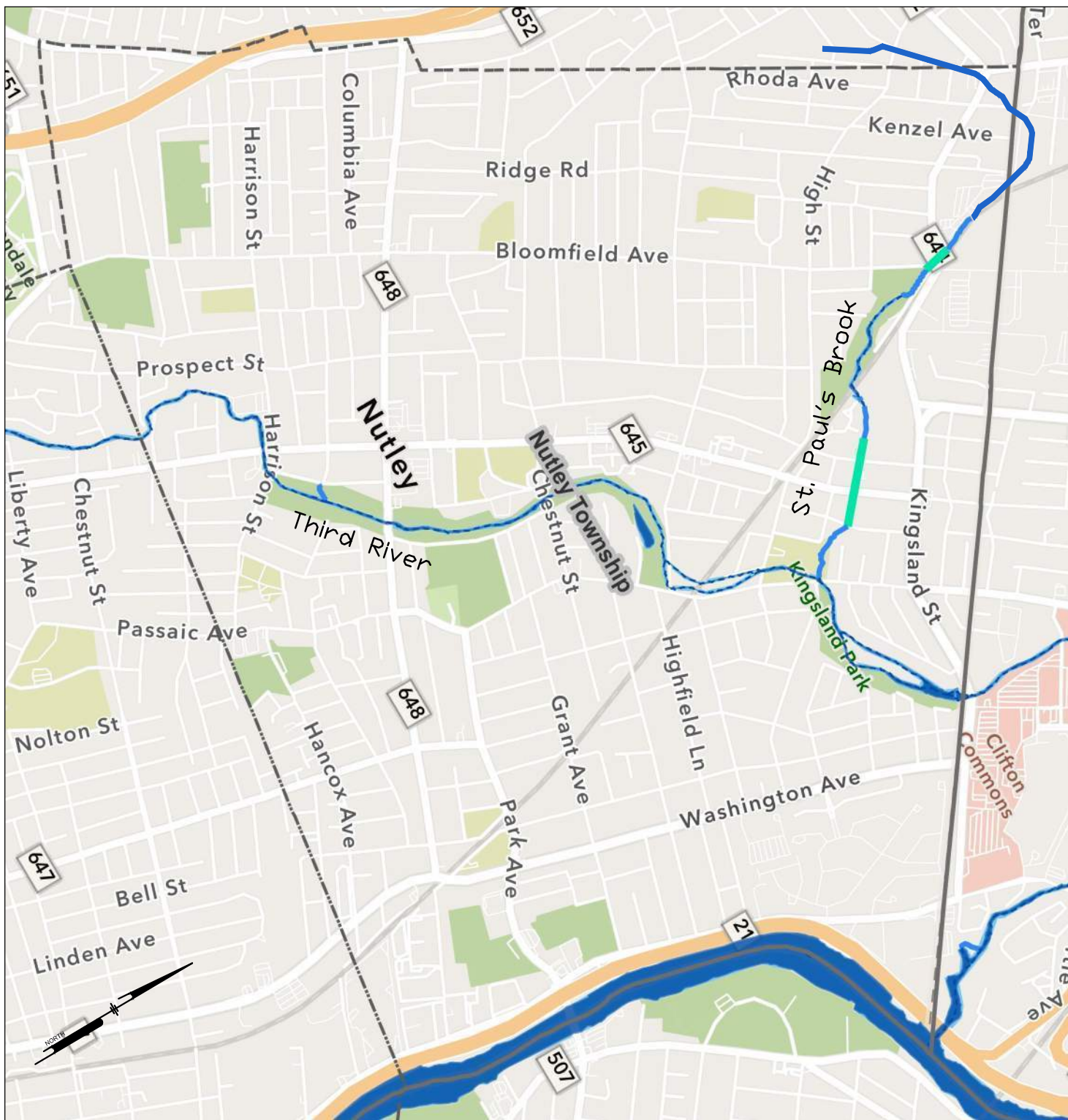
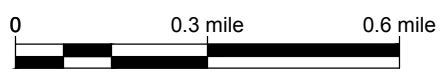


Figure C-2:
Township and Its
Waterways

- Water Bodies
- County Boundaries
- Municipalities
- Streams
- Stream/River
- Artificial Path
- Connector
- Pipeline



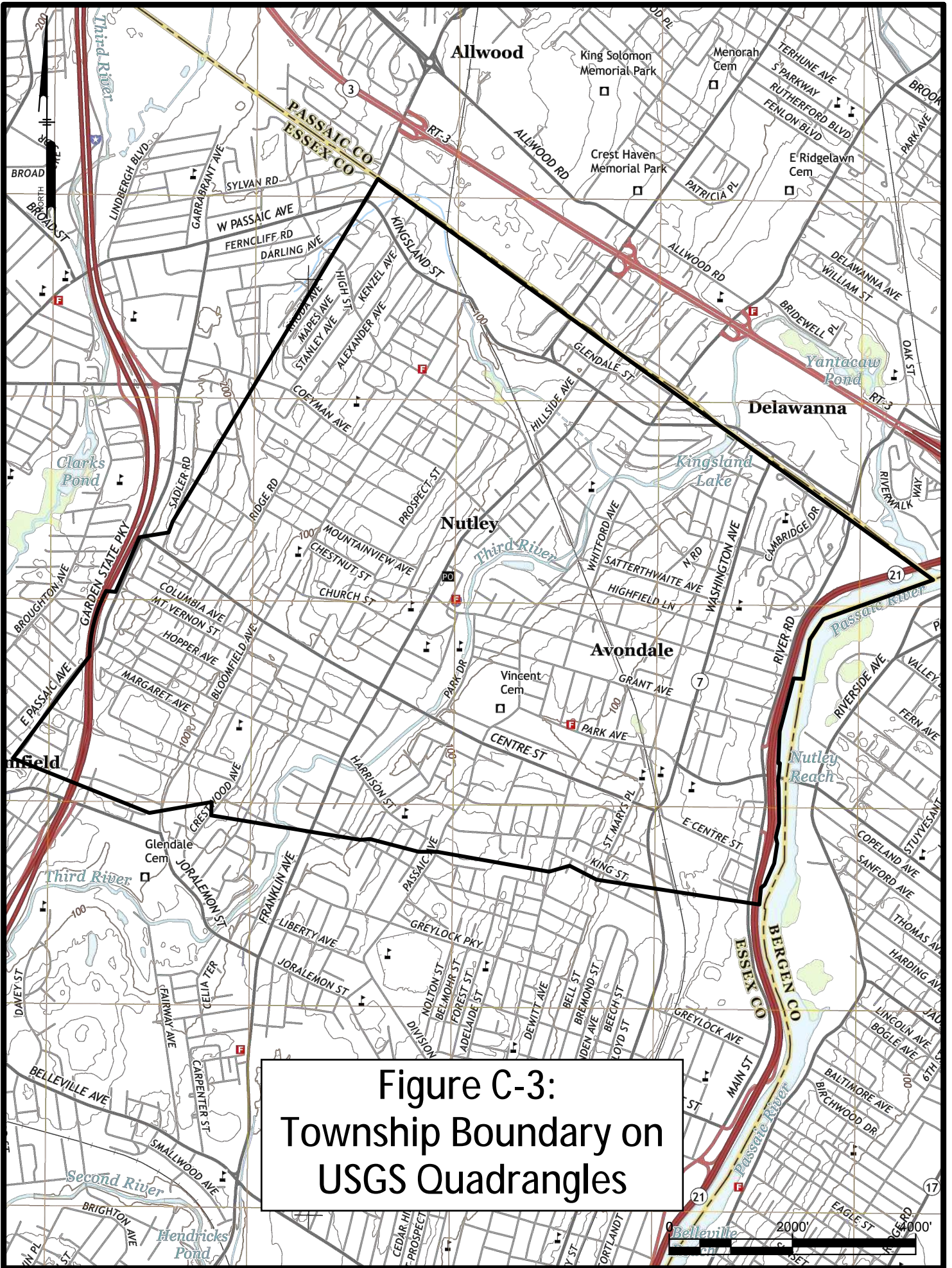
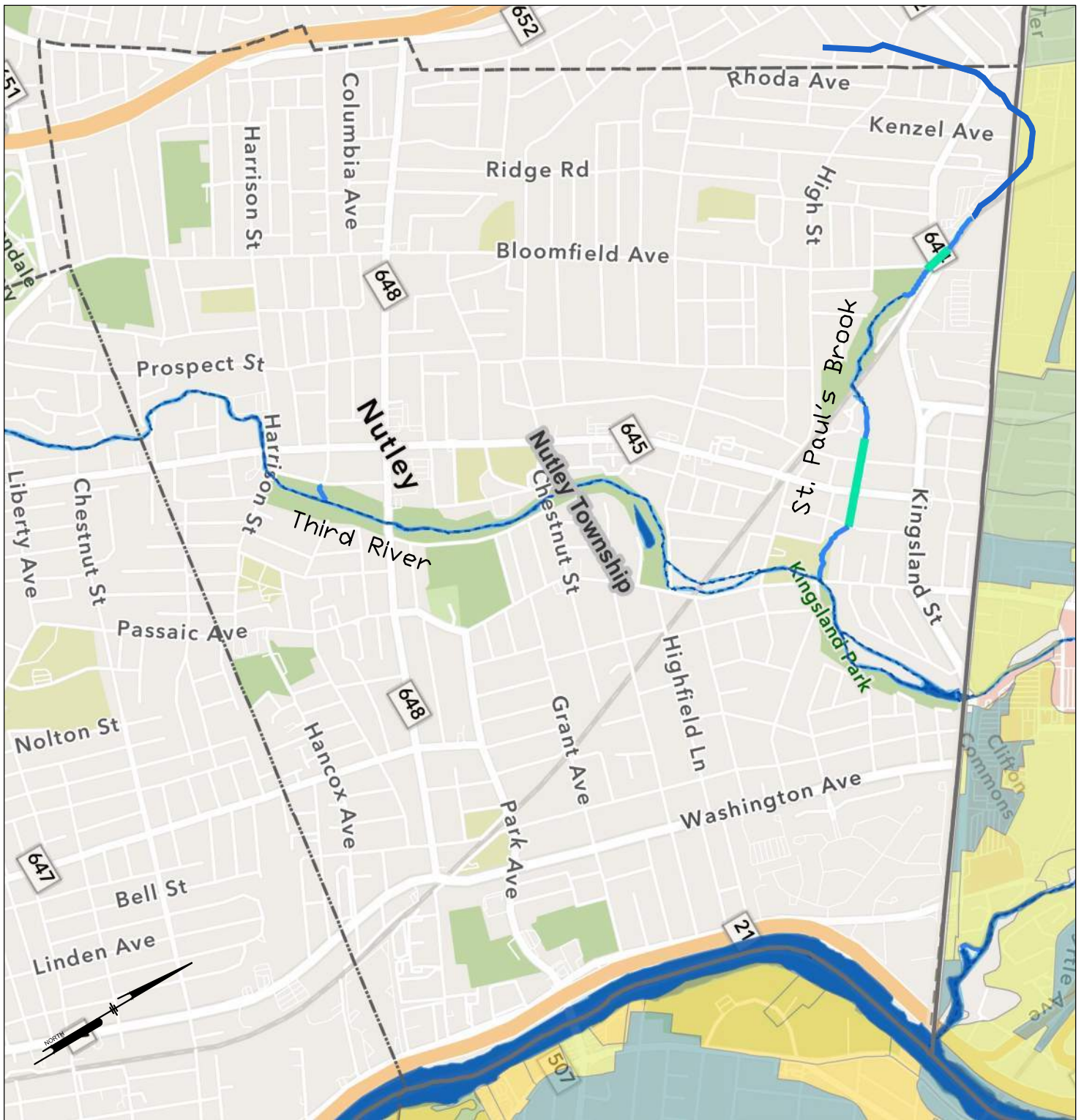


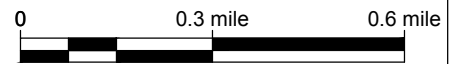
Figure C-3:
Township Boundary on
USGS Quadrangles

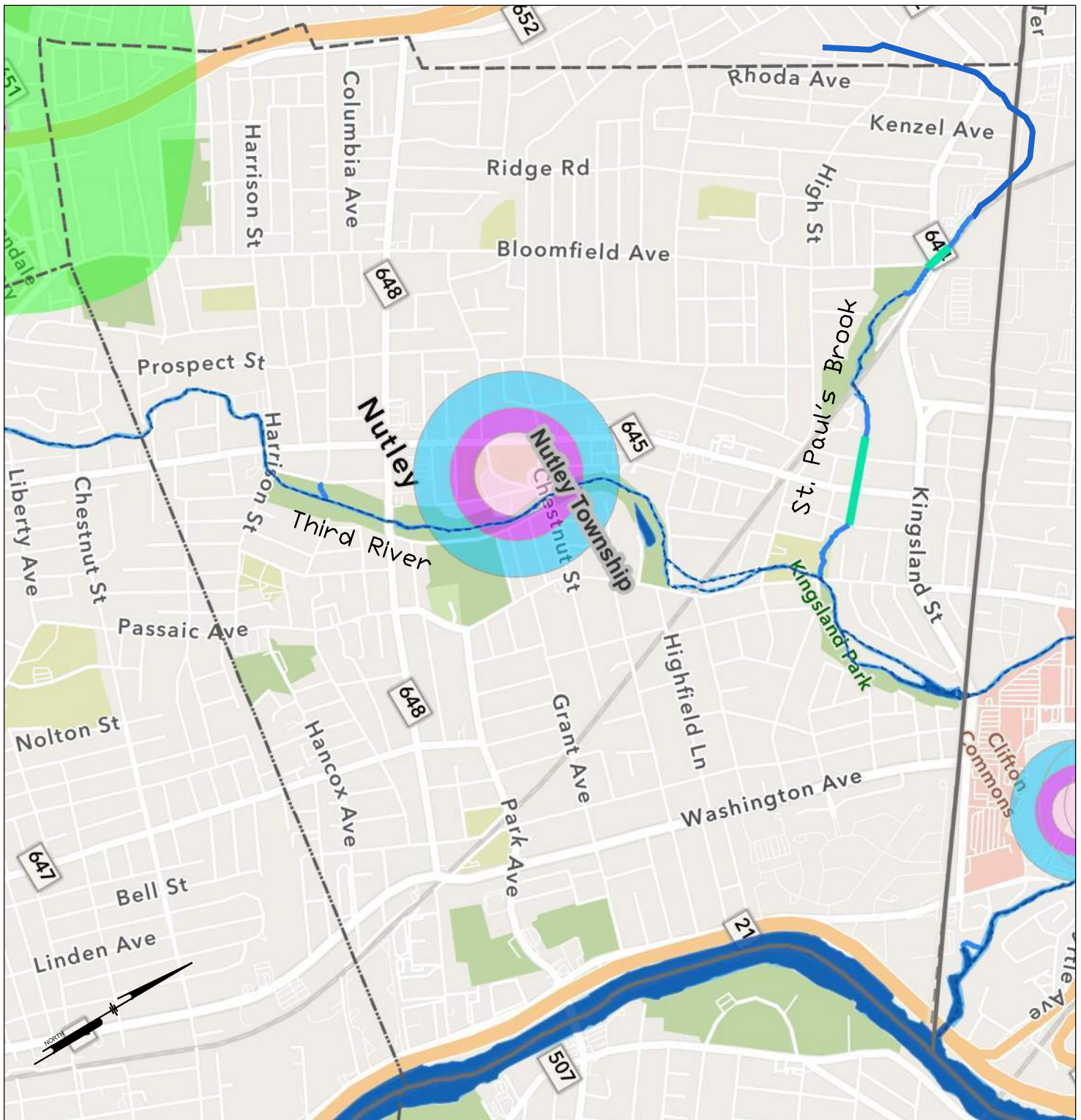
U:\ACCOUNTS\NLT\NLT21101 - NUTLEY - STORMWATER GENERAL PERMIT\DESIGN, SHEETS\TOWNSHIP BOUNDARY ON USGS QUADRANGLES.DWG
PLOTTED: 7/20/2012 10:46:48 AM, BY: PHILIP R. WEEHAN PLOTSTYLE: PENNONI NCS.STB, PROJECT STATUS: ---



- Water Bodies
- Ground Water Recharge Areas in New Jersey - Ground Water Recharge Areas
- 16 to 23 in/yr
- 11 to 15 in/yr
- 8 to 10 in/yr
- 1 to 7 in/yr
- 0 in/yr
- hydric soil
- wetlands and open water
- no recharge calculated
- County Boundaries
- Municipalities
- Streams
- Stream/River
- Artificial Path
- Connector
- Pipeline

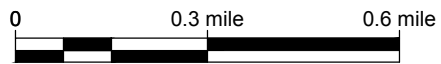
**Figure C-4:
Groundwater
Recharge
Areas in the
Township**

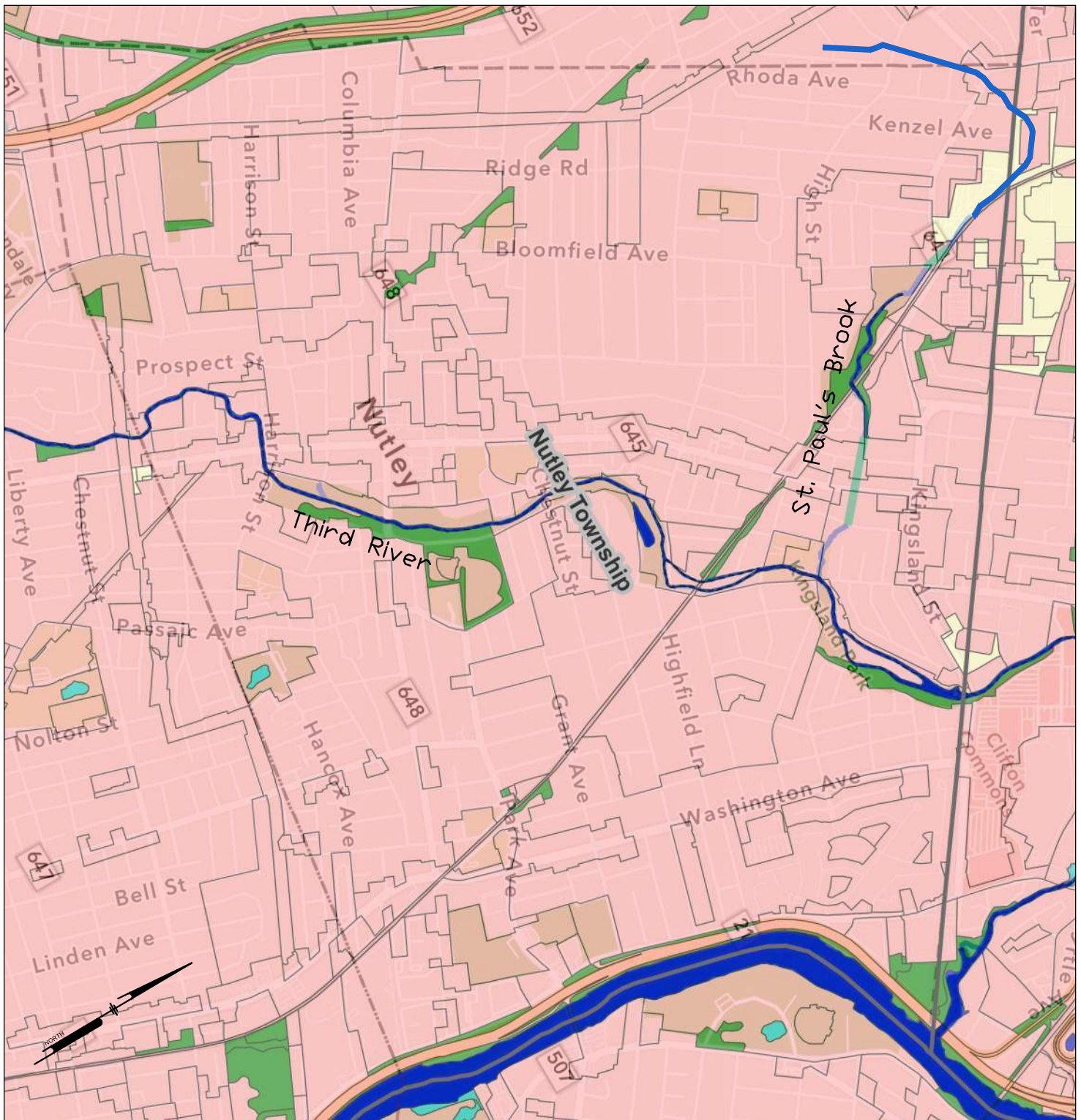




**Figure C-5:
Wellhead Protection Areas**

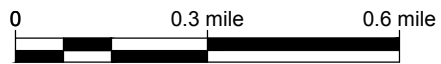
- | | |
|---|---|
|  Water Bodies | Well Head Protection Areas (Community) |
|  County Boundaries |  Tier 1: 2-Year |
|  Municipalities |  Tier 2: 5-Year |
| Streams |  Tier 3: 12-Year |
|  Stream/River | Well Head Protection Areas (Non-Community) |
|  Artificial Path |  Tier 1: 2-Year |
|  Connector |  Tier 2: 5-Year |
|  Pipeline |  Tier 3: 12-Year |



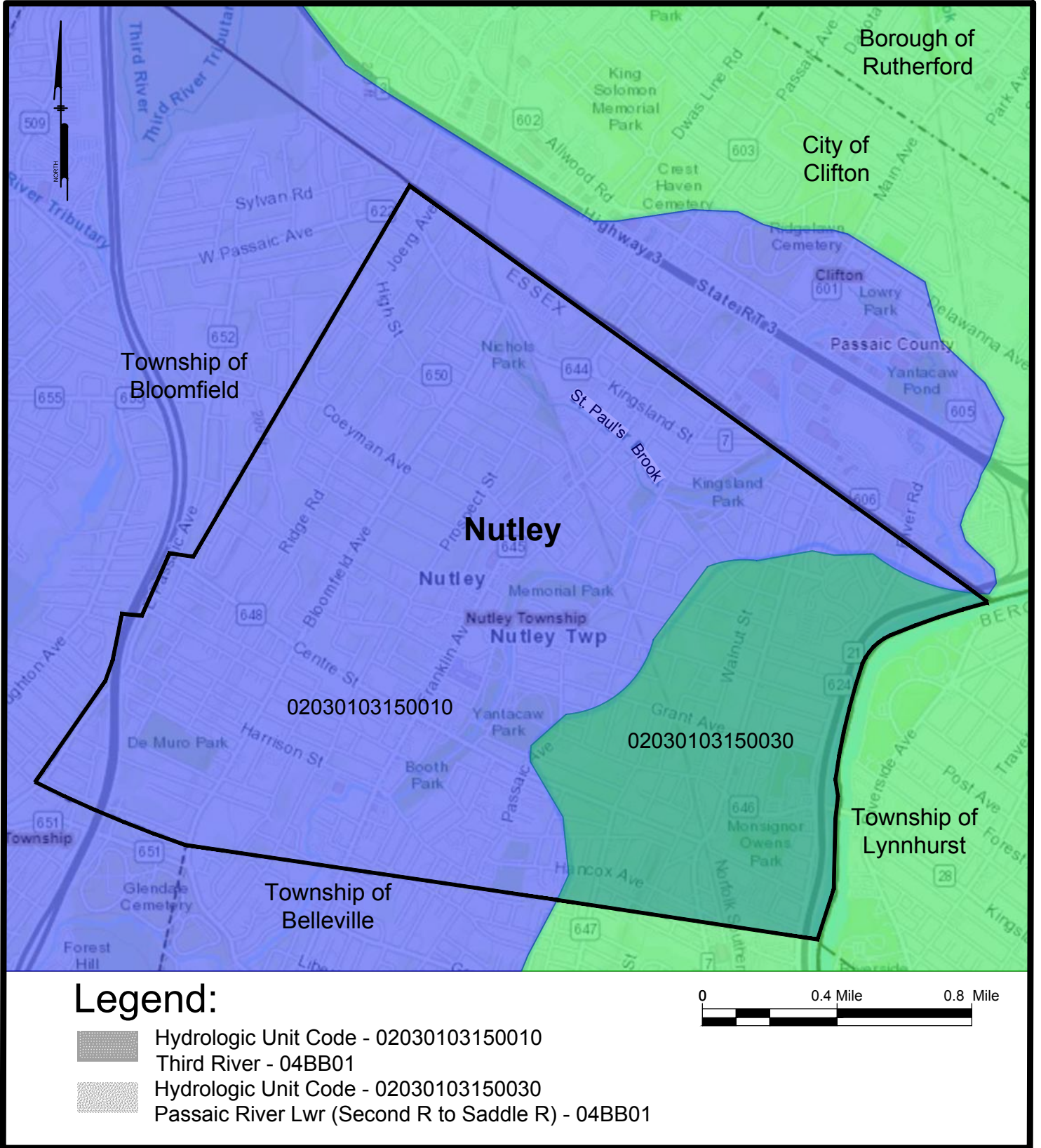


**Figure C-6:
Township Land Use**

- | | | |
|----------------------|----------------|-----------------|
| Water Bodies | FOREST | Streams |
| County Boundaries | URBAN | Stream/River |
| Land Use 2020 | WATER | Artificial Path |
| AGRICULTURE | WETLANDS | Connector |
| BARREN LAND | Municipalities | Pipeline |



Watershed Management Area #4: Passaic River Lower (Nwk Bay to Saddle River)

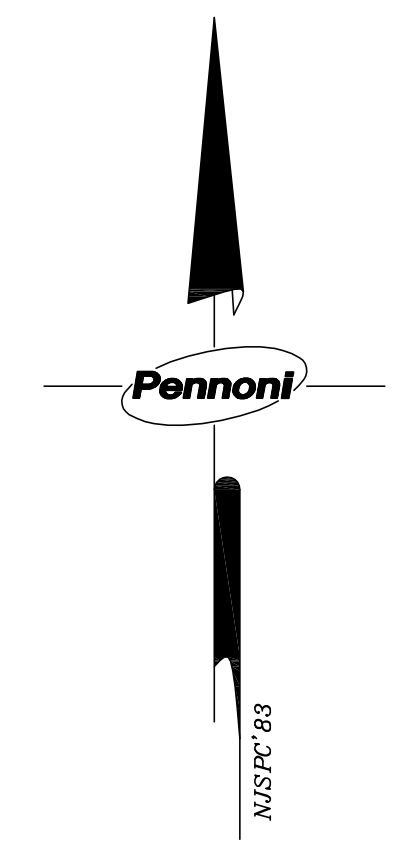
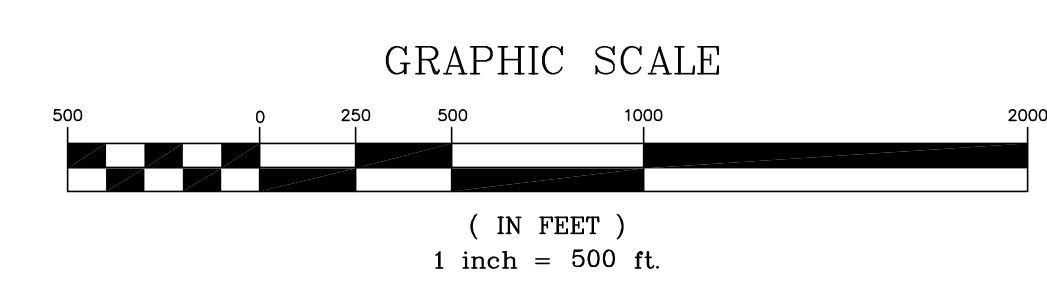


**Figure C-7:
Hydrologic Units (HUC14s) Within the Township**

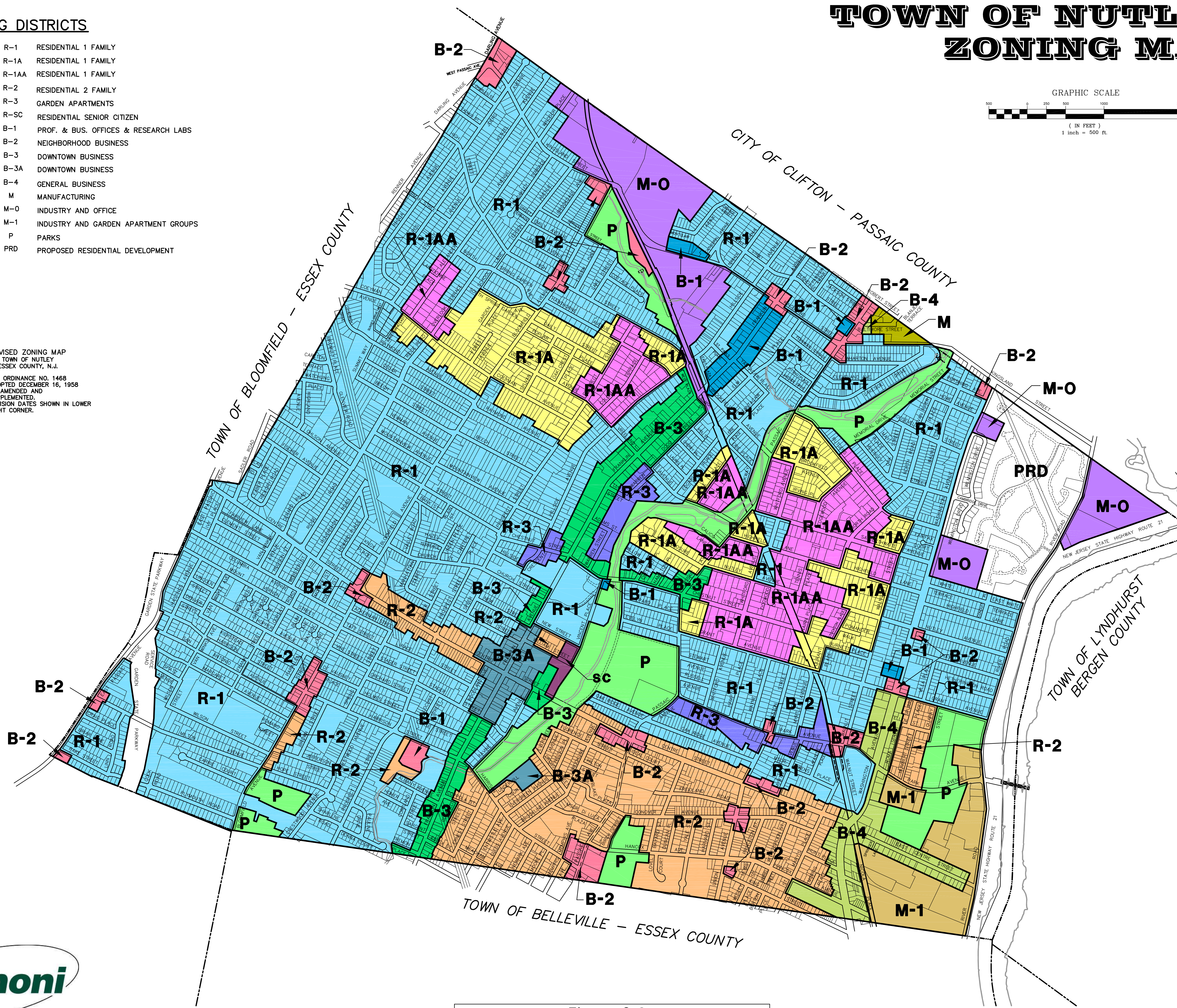
TOWN OF NUTLEY, N.J. ZONING MAP

ZONING DISTRICTS

- R-1 RESIDENTIAL 1 FAMILY
- R-1A RESIDENTIAL 1 FAMILY
- R-1AA RESIDENTIAL 1 FAMILY
- R-2 RESIDENTIAL 2 FAMILY
- R-3 GARDEN APARTMENTS
- R-3C RESIDENTIAL SENIOR CITIZEN
- B-1 PROF. & BUS. OFFICES & RESEARCH LABS
- B-2 NEIGHBORHOOD BUSINESS
- B-3 DOWNTOWN BUSINESS
- B-3A DOWNTOWN BUSINESS
- B-4 GENERAL BUSINESS
- M MANUFACTURING
- M-0 INDUSTRY AND OFFICE
- M-1 INDUSTRY AND GARDEN APARTMENT GROUPS
- P PARKS
- PRD PROPOSED RESIDENTIAL DEVELOPMENT



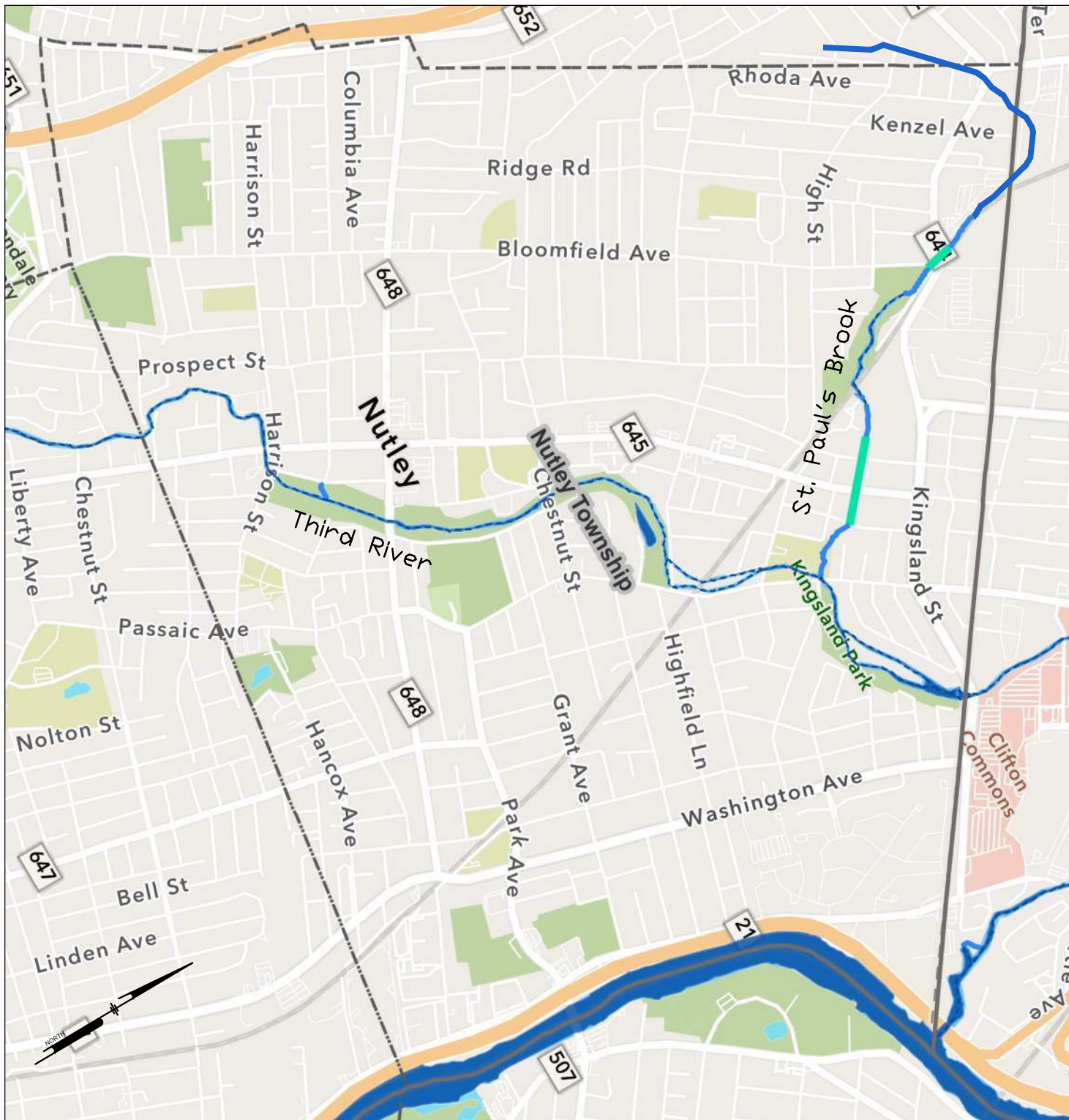
REVISED ZONING MAP
TOWN OF NUTLEY
ESSEX COUNTY, N.J.
SEE ORDINANCE NO. 1468
ADOPTED DECEMBER 16, 1958
AS AMENDED AND
SUPPLEMENTED.
REVISION DATES SHOWN IN LOWER
RIGHT CORNER.











REVISION DATES	
1	NOVEMBER 30, 1960
2	SEPTEMBER 21, 1965
3	FEBRUARY 14, 1969
4	MAY 15, 1970
5	JULY 9, 1974
6	OCTOBER 3, 1975
7	DECEMBER 14, 1978
8	MAY 4, 1982
9	MARCH 8, 1983
10	AUGUST 22, 1984
11	JANUARY 30, 1989
12	MAY 28, 1989
13	AUGUST 29, 2001
14	MAY 10, 2007

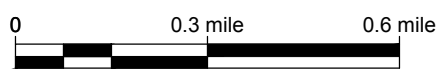


Figure C-8:
Zoning Districts Within the Township



**Figure C-9:
Wetlands and Water Land
Uses within the Township**

- | | |
|---|---|
|  Water Bodies | Streams |
|  Wetlands (2012) |  Stream/River |
|  County Boundaries |  Artificial Path |
|  Municipalities |  Connector |
| |  Pipeline |



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18N. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM OR State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSM-C-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided in digital format by the New Jersey Office of Information Technology (NJ-OIT), Office of Geographic Information Systems (OGIS). This information was derived from digital orthophotos produced at a scale of 1:2400 (1"=200') with a 1 foot pixel resolution from photography dated 2012.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unreviewed streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LIMWA)**. The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

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If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/national-flood-insurance-program>.

NJFHADF is equal to the 1-percent-annual chance flood plus an additional 25% in flow, and not to exceed the 0.2-percent-annual chance flood. NJFHADF boundary is to regulate disturbance to the land and vegetation within flood hazard area of a water body. This regulation is set forth by the State of New Jersey Flood Hazard Area Control Act Rules N.J.A.C. 7-13, and is administered by New Jersey Department of Environmental Protection (NJDEP).

Township of Montclair 340188



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE D Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- New Jersey Flood Hazard Area Design Flood (NJFHADF)
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- Base Flood Elevation line and value; elevation in feet* (EL 987)
- Base Flood Elevation value where uniform within zone; elevation in feet*
- * Referenced to the North American Vertical Datum of 1988
- Cross section line
- Limited detail cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 18N
- 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5
- River Mile
- MAP REPOSITORY
- Refer to listing of Map Repositories on Map Index
- EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
- June 4, 2007
- EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
- For description of revisions, see Notes to Users page in the Flood Insurance Study report.
- For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.
- To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

**Figure C-10:
FEMA Floor Insurance
Rate Map Panel
34013C0108G**

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0108G

FIRM

FLOOD INSURANCE RATE MAP

**ESSEX COUNTY,
NEW JERSEY
(ALL JURISDICTIONS)**

PANEL 108 OF 200
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BLOOMFIELD, TOWNSHIP OF	340178	0108	G
MONTCLAIR, TOWNSHIP OF	340188	0108	G
NUTLEY, TOWNSHIP OF	340191	0108	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER
34013C0108G**

**MAP REVISED
APRIL 3, 2020**

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

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Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

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Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

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NOAA, NNGS12
National Geodetic Survey
SSM-C-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unreviewed streams may differ from what is shown on previous maps.

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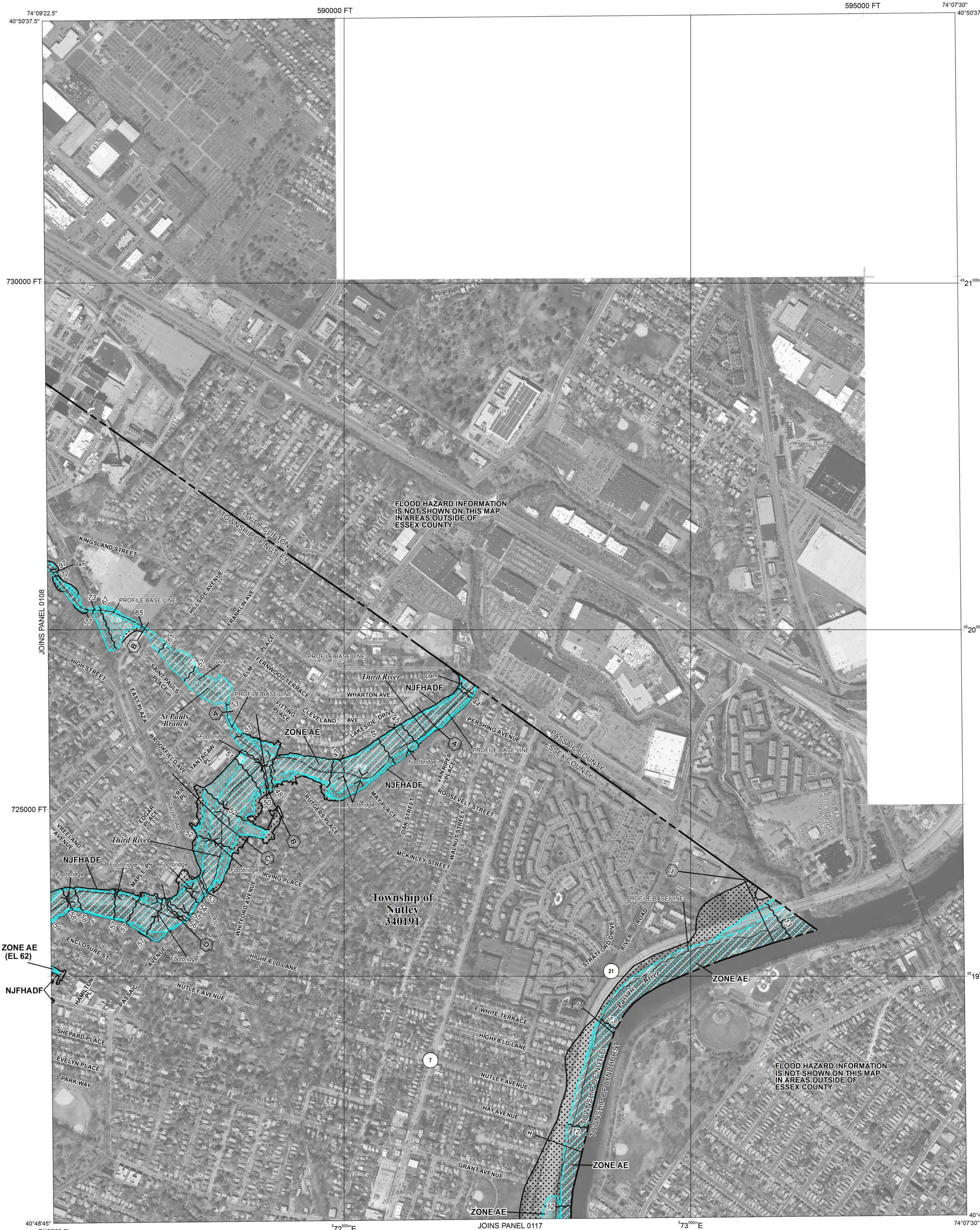
The AE Zone category has been divided by a **Limit of Moderate Wave Action (LIMWA)**. The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

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**Figure C-11:
FEMA Floor Insurance
Rate Map Panel
34013C0109G**



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently dismantled. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS
ZONE D Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS
OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- New Jersey Flood Hazard Area Design Flood (NJFHADF)
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action

513 Base Flood Elevation line and value; elevation in feet*
(EL 987)
Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988
A Cross section line
B Limited detail cross section line
C Transsect line

87°07'45", 32°22'30"
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

276°00'N 1000-meter Universal Transverse Mercator grid values, zone 18N
600000 FT 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection

DX5510 x Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 River Mile

MAP REPOSITORY Refer to listing of Map Repositories on Map Index
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP June 4, 2007

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL For description of revisions, see Notes to Users page in the Flood Insurance Study report.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0109G

FIRM
FLOOD INSURANCE RATE MAP

ESSEX COUNTY, NEW JERSEY (ALL JURISDICTIONS)

PANEL 109 OF 200
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
NUTLEY, TOWNSHIP OF	340191	0109	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 34013C0109G
MAP REVISED APRIL 3, 2020
Federal Emergency Management Agency

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To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18N. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM OR State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSM-C-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided in digital format by the New Jersey Office of Information Technology (NJ-OIT), Office of Geographic Information Systems (OGIS). This information was derived from digital orthophotos produced at a scale of 1:2400 (1"=200') with a 1 foot pixel resolution from photography dated 2012.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unreviewed streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LIMWA)**. The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/national-flood-insurance-program>.

NJFHADF is equal to the 1-percent-annual chance flood plus an additional 25% in flow, and not to exceed the 0.2-percent-annual chance flood. NJFHADF boundary is to regulate disturbance to the land and vegetation within flood hazard area of a water body. This regulation is set forth by the State of New Jersey Flood Hazard Area Control Act Rules N.J.A.C. 7:13, and is administered by New Jersey Department of Environmental Protection (NJDEP).

**Figure C-12:
FEMA Floor Insurance
Rate Map Panel
34013C0116G**



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently dismantled. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE
 The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS
ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS
OTHERWISE PROTECTED AREAS (OPAs)
 CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
 New Jersey Flood Hazard Area Design Flood (NJFHADF)
 0.2% annual chance floodplain boundary
 Floodway boundary
 Zone D boundary
 CBRS and OPA boundary
 Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
 Limit of Moderate Wave Action
 Base Flood Elevation line and value; elevation in feet* (EL 987)
 Base Flood Elevation value where uniform within zone; elevation in feet*
 * Referenced to the North American Vertical Datum of 1988
 Cross section line
 Limited detail cross section line
 Transsect line
 Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
 1000-meter Universal Transverse Mercator grid values, zone 18N
 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
 Bench mark (see explanation in Notes to Users section of this FIRM panel)
 River Mile
 MAP REPOSITORY
 Refer to listing of Map Repositories on Map Index
 EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
 June 4, 2007
 EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
 For description of revisions, see Notes to Users page in the Flood Insurance Study report.
 For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.
 To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
 250 0 500 1000 FEET
 150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0116G

FIRM
FLOOD INSURANCE RATE MAP

ESSEX COUNTY, NEW JERSEY (ALL JURISDICTIONS)

PANEL 116 OF 200
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BELLEVILLE, TOWNSHIP OF	340177	0116	G
BLOOMFIELD, TOWNSHIP OF	340178	0116	G
NEWARK, CITY OF	340189	0116	G
NUTLEY, TOWNSHIP OF	340191	0116	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 34013C0116G
MAP REVISED APRIL 3, 2020
 Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevation (BFE)** and/or **Floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevation (CBFE) shown on this map apply only landward of 0' North American Vertical Datum (NAVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** is NAD83, CRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the New Jersey Office of Information Technology produced in State Plane NAD83 Coordinates (US Survey) with 1 foot pixel resolution and a scale of 1:2400 from photography captured during February-April 2002.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the FEMA Map Service Center at the following phone numbers and Internet address for information on all related products available from FEMA:

Phone: 800-358-9616
FAX: 800-358-9620
www.fema.gov/msc

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at www.fema.gov.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.

Figure C-13:
FEMA Floor Insurance
Rate Map Panel
34013C0117F



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

- ZONE A** No base flood elevations determined.
- ZONE AE** Base flood elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently dismantled. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.
- ZONE A99** Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

OTHERWISE PROTECTED AREAS (OPAs)

OPAs are normally located within or adjacent to Special Flood Hazard Areas.

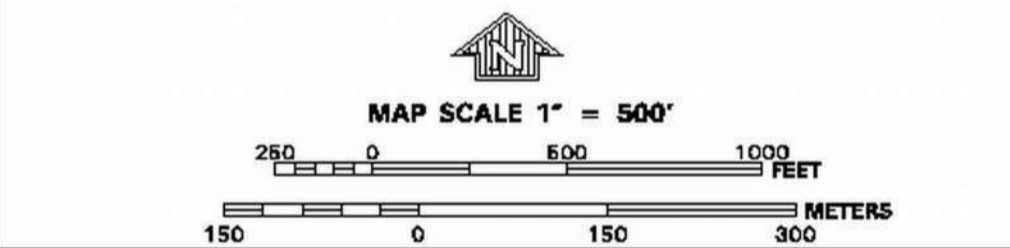
- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and CPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or velocities.
- Base Flood Elevation line and value; elevation in feet* (EL 997)
- Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- (A) (A) Cross Section Line
- (23) (23) Transsect Line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 427600M 1000-meter Universal Transverse Mercator grid values, zone 18
- 600000 FT 6000-foot grid ticks
- DX5510 X Bench mark (see explanation in Notes to Users section of this FIRM)
- M1.5 River Mile

MAP REPOSITORY
Refer to Repository Listing on Index Map
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
JUNE 4, 2007
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.



PANEL 0117F

FIRM
FLOOD INSURANCE RATE MAP
ESSEX COUNTY,
NEW JERSEY
(ALL JURISDICTIONS)

PANEL 117 OF 200
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS	NUMBER	PANEL	REVISION
NUTLEY, TOWNSHIP OF	34013	0117	F
BELLEVILLE, TOWNSHIP OF	34017	0117	F
NEWARK, CITY OF	34019	0117	F

Notes to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
34013C0117F
EFFECTIVE DATE:
JUNE 4, 2007

Federal Emergency Management Agency