

CITY OF BURLINGTON



MUNICIPAL STORMWATER MANAGEMENT PLAN

PREPARED FOR:

CITY OF BURLINGTON
525 High Street
Burlington, New Jersey 08016

NJPES #NJG 0153109
PI ID # 171529
Burlington County

DRAFT: MARCH 23, 2005

FINAL: APRIL 27, 2005

REVISED: AUGUST 1, 2006

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ATTACHMENT 1: Referred to on pages 11 and 19, the City of Burlington Stormwater Ordinance has been adopted and can be found in the Municipal Code on the Clerk's page of the City Website, www.burlingtonnj.us

1.0 Introduction - City of Burlington Stormwater Management Plan

This Municipal Stormwater Management Plan documents the strategy for the City of Burlington to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:1 4A-25 Municipal Stormwater Regulations. This plan contains all of the elements required as part of the municipal Tier A MS4 permit as described in N.J.A.C. 7:8 Section 4.2 of the Stormwater Management Rules. The City of Burlington does not contain more than one square mile of open space and agricultural land. As described in schedule for adoption of the stormwater management plan and ordinances N.J.A.C. 7: 8 Section 4.3, an exemption will be documented for the completion of elements N.J.A.C. 7:8-4.2 (c) 8 & 9 as part of this Stormwater Management Plan.

An aerial view of the City, which illustrates the major waterways, is provided in the Appendix, **Map 1, Existing Conditions**. This Municipal Stormwater Management Plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land. Note that the definition of major development for the Stormwater Management Plan does not include the increase of impervious area by more than one quarter acre. The implementation of these standards into the City of Burlington Master Plan is intended to minimize the adverse impact of stormwater runoff on water quality and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan stresses best management practices with long-term operation and maintenance measures for existing and future stormwater facilities that perform well in the flood zone conditions within the City of Burlington and can be maintained by the City Public Works Department.

The City of Burlington Land Use Ordinance does not specifically address stormwater management design standards. Residential development is currently required to conform to the most current stormwater management requirements of N.J.A.C. 7:8 5.4 and 5.5 through conformance to the Residential Site Improvement Standards (RSIS). Under the review process, all non-residential development has been requested to meet water quality design standards by the municipal engineer.

For commercial development of less than one acre, the City of Burlington has the discretion to determine the stormwater management requirements. For non-residential development of less than one acre in size, the stormwater management system will be evaluated by the municipal engineer based on the location of the site in relation to the flood plain, the location of the site in relation to the Kennedy lake system that provides water quality, and the recharge requirements based on the definition under NJAC 7:8-1.2 of “urban redevelopment area” as a previously developed portion of an area delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1).

The final component of Burlington City Stormwater Management Plan is a mitigation plan that identifies what measures are necessary to offset the deficit created by granting an exemption from the stormwater design and performance standards. Stormwater management projects are identified according to sub-drainage area within the City of Burlington as alternative projects if a development project cannot meet the stormwater standards.

This plan has been prepared in conformance with the Management Plan for the Rancocas Creek Watershed dated March 2003 prepared by the Burlington County Department of Resource Conservation. This plan will be reviewed and approved by the Burlington County Planning Department in accordance with the NJPDES Permit for the municipality and NJAC 7:8-4.4.

2.0 Goals- City of Burlington

The goals of the City of Burlington Municipal Stormwater Management Plan are to:

- *Reduce flood damage, including damage to life and property;*
- *Improve and maintain water quality*
- *Improve existing Kennedy lake system that provides water quality and flood safety*
- *Protect public safety through the proper design and operation of best management practices.*
- *Reduce silting and scouring at outfalls;*
- *Reduce fecal coliform levels through wildlife habitat management*
- *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; and*
- *Reduce runoff*
- *Maximize water supplies through better water management*

To achieve these goals, a variety of management strategies are proposed for implementation. These strategies have been developed in conformance with the recommendation of the Rancocas Creek Watershed Plan dated March 2003 prepared by the Burlington County Department of Resource Conservation.



3.0 Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure 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.

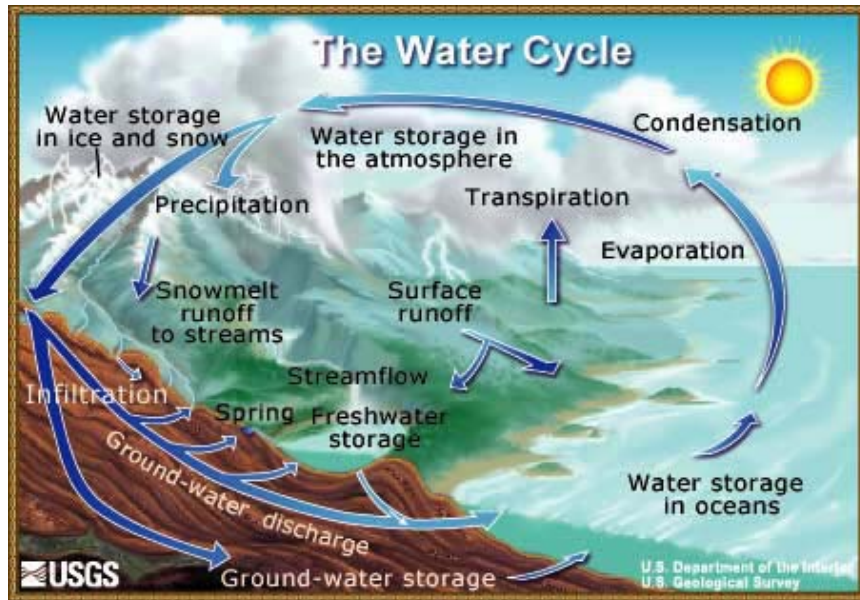


Illustration by John M. Evans, Colorado District, USGS

Figure 1. Hydrologic Cycle

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 drainage problems and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Downstream erosion and sediment deposits can be seen in Photograph 1.



Photograph 1. Sediment Deposits

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.

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. Groundwater recharge and well head protection areas are shown in the Appendix, on **Map 2, Groundwater Recharge and Wellhead Protection Areas (WPAs)**.

4.0 Plan Consistency – Regional Stormwater Watershed Plan

Burlington City drains to the Assiscunk Creek. The Rancocas Creek is the adjacent drainage shed to the west of the Assiscunk Creek that also drains to the Delaware River. A regional watershed management plan for the Assiscunk Creek has not been developed. Therefore, this plan has been prepared in conformance Rancocas Creek Watershed Management Plan.

The NJDEP funded the Rancocas Watershed Management Plan through a grant with Burlington County. The Rancocas Creek Watershed Management Plan was finalized in March of 2003 by the Burlington County Department of Resource Conservation. The plan is the result of an effort from 1998 to 2003 by the New Jersey Department of Environmental Protection, the Public Advisory Committee (PAC), Omni Environmental, Burlington County Office of Land Use and six public subcommittees.

The Rancocas Creek Watershed Management Plan is a 29 page written summary report with a computer CD containing the Appendices. The Characterization and Assessment Report of the watershed is a Microsoft Power Point presentation contained on the CD. The assessment report is based on a water quality approach. The assessment reviews the NJDEP data and status of water quality for oxygen, phosphorous, nitrogen, fecal coliform, total dissolved solids and pH.

The Rancocas Creek Watershed Management Plan recommends that municipal ordinances should be enacted for commercial and industrial sites to require stormwater inserts to remove floatables, oils and other pollutants as well as long term maintenance insured by escrow accounts. The plan recommends strengthening buffer protection ordinances, with sample buffer protection ordinances provided. The report contains a ranking of open space parcels within Burlington County. A separate report by the Burlington County Soil Conservation compiling a prioritized list of “Action Now” projects for bank restoration and repair is referenced.

5.0 City of Burlington

5.1 Population and Land Use

The City of Burlington encompasses a 3.73 square mile area of Burlington County, New Jersey. Over the past thirty years, the increased commercial and residential development in the traditional agricultural regions of the County has resulted in a steady decline of the City's population. Over this period, the population has declined from 12,010 in 1970 to 10,246 in 1980 to 9,835 in 1990 to 9,736 in 2000. However, the City has experienced some development pressure in recent years as indicated by the chart of new building permits issued over the past ten years (see Table 1).

As of 2003, the City hosts two transit stops along the new Camden-Trenton Light Rail Line. The completion of the train line and the City's redevelopment efforts will likely create new redevelopment opportunities. The Stormwater Management Plan anticipates and plans for this new development activity in order to mitigate any negative effects on the City's waterways, such as increased stormwater runoff volumes and pollutant loads.

Year	Units
1991	3
1992	13
1993	19
1994	13
1995	8
1996	5
1997	0
1998	57
1999	41
2000	11
2001	13

The majority of land use within the City of Burlington is urban. The existing land uses within Burlington can be seen in the Appendix **Map 3, Land Use – Wetlands Designations**.

5.2 Description of Watershed

Burlington City is located within final reach of the Assiscunk Creek adjacent to the Delaware River. The Assiscunk Creek is located in the southwestern corner of Watershed Management Area 20, for the Assiscunk, Crosswicks and Doctors Creeks. Watershed Management Area 20 is one of the twenty major watersheds in the State of New Jersey shown in the Appendix on **Map 4, New Jersey's Watershed, Watershed Management Areas and Water Regions.**

The United States Geologic Survey (USGS) uses a 14 digit Hydrologic Unit Code (HUC 14) to delineate and name each sub-watershed with each major watershed area. There are three separate sub-watershed drainage delineations within the City of Burlington as shown in the Appendix on **Map 5, HUC-14 Delineation on USGS Quadrangle Map.**

The three watersheds within the City of Burlington are:

- 02040201100060, Assiscunk Creek (below Neck Road), Within Burlington City, drainage flows to the Assiscunk Creek.
- 02040201110010, LDRV tribs (Beverly to Assiscunk CK), Within Burlington City, drainage flows through the storm sewer system to the Kennedy lake system that is connected by the “city ditch” then to the City sewage treatment facility and then to the Delaware River.
- 02040201090030, LDRV, (Assiscunk Creek to Blacks Creek), land area adjacent to the Delaware River has overland surface runoff that reaches the Delaware River directly.

The majority of the land area within the City of Burlington is located below the flood plain elevation per the flood insurance rate maps prepared by the Federal Emergency Management Association (FEMA). The potential flood prone areas and flood prone areas are shown in the Appendix on **Map 6, Flood Prone Areas.**

The Kennedy lake system on the western side of the Assiscunk Creek provides a unique solution to the drainage and flood elevation conditions within Burlington City. In addition the City of Burlington has over 2,000 storm inlets located on city streets, an exceptional number for a 3.73 square mile area. By lowering the Kennedy lake system prior to a major storm event, the City of Burlington Engineer is able to reduce flood damage by draining the streets into the lake and city ditch system. The Kennedy lake system performs as a stormwater detention system and provides water quality for the western side of the municipality.

5.3 State Waterway Conditions

The New Jersey Department of Environmental Protection (NJDEP) and the USGS collect a variety of water quality information on the Assiscunk Watershed. The USGS conducts water quality sampling outside of the City of Burlington

The NJDEP has established and maintains an Ambient Biomonitoring Network (AMNET) of monitoring sites 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 macro invertebrates by NJDEP on a five-year cycle. Benthic macro invertebrates include aquatic insects, worms, snails, crayfish and clams. Every five years, 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 bioethics related to benthic macroinvertebrate community dynamics. The AMNET sampling serves as an indicator of the stream health, but does not provide any information on the cause of the impairment.

There are no AMNET sites within the City of Burlington. The AMNET sites within close proximity to the City of Burlington are shown in the Appendix on **Map 8, AMNET and Stream Quality Monitoring Stations**. The closest AMNET station AN0142 is located on the Assiscunk Creek at Neck Road in Burlington Township and is noted as severely impaired.

The total maximum daily load, abbreviated TMDL, is the amount of a pollutant that can be accepted by a water body without exceeding water quality standards or interfering with the ability to use a water body for one or more of its designated uses. A TMDL is a tool used to achieve water quality standards through mathematical analysis of the percent reduction of a pollutant from a particular source needed to meet the concentration specified in the water quality

standards. 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 best management practices or BMPs.

There have been two TMDLs issued for the Delaware River. One TMDL Report was issued by the New Jersey Department of Environmental Protection on September 2003 entitled Total Maximum Daily Loads for Polychlorinated Biphenyls (PCBs) for Zones 2-5 of the Tidal Delaware River as prepared by the Delaware River Basin Commission. Another TMDL entitled "Delaware River Estuary Zones 2 & 3" was developed through the Delaware River Basin Commission (DRBC) and The Estuary Program. This TMDL was approved by NJDEP on May 22, 2000 and established that the Delaware River is above assimilative capacity for tetrachloroethene (TCE) and 1,2-dichloroethane (1,2 DCE) in the tidal Delaware River. If numerical allocations are set in the future for these impairments, the Municipal Stormwater Management Plan will be amended to address the impairment and ordinances will be revised to implement the modifications.

6.0 Design and Performance Standards

All residential development projects over one acre must currently meet the storm water management design and performance standards of N.J.A.C. 7:8 through the implementation of the Residential Site Improvement Standards. All non-residential development over one acre will be required to conform to the design and performance standards of N.J.A.C. 7:8 through the implementation of the City of Burlington stormwater management plan. The City of Burlington stormwater management ordinance is provided as **Attachment 1**. As required by the New Jersey Department of Environmental Protection, alternative standards such as stormwater management plans from municipalities shall provide at least as much protection from stormwater-related loss of groundwater recharge, stormwater quantity and water quality impacts of major development projects as would be provided under the standards in N.J.A.C. 7:8-5. The three basic requirements of the stormwater regulation of NJAC 7:8-5 are:

1. Water Quantity – The peak rate of runoff for the 2, 10, and 100 year storm must be reduced by 50, 75, and 80 percent.
2. Water quality – Total suspended solids in the runoff water must be reduced by 80% by various methods.
3. Recharge – The annual amount of rainfall that previously infiltrated into the ground must continue to infiltrate into the ground after the storm is developed.

Since the City of Burlington is predominantly developed, there will be few opportunities for development on undisturbed land greater than one acre. The majority of development will occur on redevelopment parcels. Due to the unique characteristic of Burlington City the following stormwater characteristics are noted:

(1) Water Quantity. Per NJAC 7:8.Subchapter 5.4.a.3.iv, In tidal flood areas, the stormwater runoff analysis shall only be applied if the increase in volume of stormwater runoff could increase flood damage below the point of discharge. In areas of Burlington City, the water quantity calculation may not be applicable. The stormwater flow rates from the City of Burlington in relationship to the flow in the Delaware River may not warrant the peak rate of runoff reduction factors.

In areas above flood stage within Burlington City, actual reduction of existing 2, 10 and 100 year peak rates of runoff on redeveloped sites may not have any benefit or meet the stormwater management goals of the Burlington City. For development projects located at sites above flood stage that flow directly to the Delaware River or the Assiscunk Creek, water quality mitigation projects within those sub-watersheds meet the goals of the City of Burlington more than providing detention facilities that reduce the peak rate of runoff. For development projects located at sites above flood stage that flow to the Kennedy lake system, water quality mitigation projects to improve the lake discharge sites or lake edge stabilization projects meet the goals of the City of Burlington more than providing detention facilities to reduce the peak rate of runoff. The mitigation projects for sites above flood stage are especially warranted if the stormwater management design involves underground detention facilities that would be constructed below the flood stage elevation.

(2) Water Quality. Water Quality will be required for all major development projects that disturb more than one acre, except for projects that drain to the Kennedy lake system. For development projects that flow to the Kennedy lake system, water quality is presently provided through the bar screen before the City sewage treatment facility and the settlement time in the Kennedy lake system. The applicant will be required to demonstrate that the areas flow into the Kennedy lake system, based on the Burlington City storm drain system map.

For all other development sites, other than those flowing to the Kennedy lake system, water quality will be required for all major development projects that disturb more than one acre. In accordance with NJAC 7:8 Subchapter 5.5, a reduction of eighty percent (80%) of total suspended solids

is required through the TSS calculations and various best management practices (BMP's). New Jersey Best Management Practices Manual provides further design specifications for the best management practices (BMP's) selected. Manufactured treatment devices in accordance with the Best Management Practices Manual Chapter 9.6 and meeting the NJDEP certification requirements will constantly be changing and will be available on the New Jersey Stormwater website of njstormwater.org under Certified Stormwater Technologies.

(3) Recharge. Per NJAC 7:8.Subchapter 5.4.a.2.ii, the groundwater recharge requirement does not apply to projects within an "urban redevelopment area". The definition under NJAC 7:8-1.2 of an "urban redevelopment area" is a previously developed portion of an area delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1). Burlington City is located entirely within Metropolitan Planning Area PA-1 on the Policy Map of the New Jersey State Development and Redevelopment Plan. Therefore, if a site had been previously developed in the City of Burlington, and is now under consideration for development, recharge does not apply.

For commercial development of less than one acre, the City of Burlington has the discretion to determine the stormwater management requirements. For non-residential development of less than one acre in size, the stormwater management system will be evaluated by the municipal engineer based on the location of the site in relation to the flood plain, the location of the site in relation to the Kennedy lake system that provides water quality, and the recharge requirements based on the definition under NJAC 7:8-1.2 of "urban redevelopment area" as a previously developed portion of an area delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1).

The City of Burlington will address the water quality impairments of the Delaware River by implementing the Stormwater Pollution Prevention Plan in accordance with the MS4 Permit. By completing the street sweeping requirements, public education requirements, implementing the annual inlet cleaning requirements, and the outfall illicit connection program, the City of Burlington will improve the water quality of storm water reaching the Delaware River through the storm drains.

The City of Burlington will ensure the proper maintenance and on going repairs to all BMP's through the Public Works Department. The Planning Board reviews development plans to ensure they meet all of the requirements of the City's ordinance and/or the Residential Site Improvement Standards. A stormwater management long term maintenance plan will be required for all projects in conformance with

the applicable regulations. In addition all projects are also required to be designed in conformance with the Standards for Soil Erosion and Sediment Control in New Jersey even though a Soil Erosion and Sediment Control Plan Certification is only required for projects that disturb over 5,000 square feet. As part of any approval that may be granted by the Board it is standard procedure to include a condition for all outside agency approvals or permits to be obtained prior to the start of construction.

City inspectors observe construction of all projects to ensure that they are constructed in accordance with the approved plans and any permits that may have been issued. This includes ensuring that stormwater management facilities are constructed properly and that soil erosion control measures are being maintained. During Construction, any deficiencies noted in the field by the City's inspector that can not be resolved with the contractor are reported to the appropriate agency, typically the City Engineer, the NJDEP Bureau of Enforcement or the Burlington County Soil Conservation District for enforcement.



Storm Inlet in Conformance with Attachment C of Stormwater Regulations

7.0 Nonstructural Stormwater Management Strategies

The evaluation of the entire master plan (including the land use element), official map and development regulations (including the zoning ordinance) is element 8 of NJAC 7:8-4.2. This element is only required for communities with more than 1 square mile of developable land. The City of Burlington contains only 3.73 square miles, of which approximately 24% (0.9 square miles) remains to be developed as can be seen in Appendix **Map 9. Developable Lands Map**. The City of Burlington meets the requirements for exemption and is not required to complete the evaluation.

8.0 Land Use/Build-Out Analysis

The Land Use/Build-Out Analysis is element 9 of NJAC 7:8-4.2. This element is only required for communities with more than 1 square mile of developable land. The City of Burlington contains only 3.73 square miles, of which approximately 24% (0.9 square miles) remains to be developed as can be seen in Appendix **Map 9. Developable Lands Map**. The City of Burlington meets the requirements for exemption and is not required to complete this analysis.

9.0 Mitigation Plans

Exemptions are provided to lessen the impact of redevelopment of existing sites within the City of Burlington where stormwater standards cannot be imposed due to physical limitations on a site. Water quality exemptions are recommended since most of the City is located in the floodplain. The applicant should provide a mitigation project of equal value within the same sub-watershed as delineated by the HUC 14 that does not negatively impact sensitive receptors. The Delaware River is the only sensitive receptor within the City of Burlington for stormwater quality based upon the TMDLs for VOCs and PCBs and stormwater quantity to prevent erosion of its shoreline.

Mitigation Plan project submissions shall include for review:

1. A table to show the required values and the values provided in the project are equivalent
2. An alternatives analysis demonstrating that on-site compliance was maximized.
3. Narrative and supporting information regarding the need for the waiver.
4. Identify the sensitive receptor and demonstrate that the mitigation project contributes to the same sensitive receptor.
5. Design details to include but not be limited to drawings, calculations, and other information needed to evaluate the mitigation project.
6. List the party or parties responsible for the construction and the future operation and maintenance of the mitigation project. Submit ownership documentation or easements as applicable.
7. Maintenance Plan meeting the requirements of Section 12 of the City's drainage ordinance.
8. Construction schedule of the mitigation project and development project.

All mitigation projects are to be reviewed and approved by the City Engineer subject to all of the requirements of the Stormwater Ordinance. Proposed mitigation projects will be evaluated based on:

1. Project must be within the same area that would contribute to the receptor impacted by the project. If there is no specific sensitive receptor impacted, then the location of the mitigation project can be located anywhere within the City, preferably at a location that would provide the most benefit.
2. Legal authorization must be obtained to construct the project at the location selected. This includes the maintenance and any access needs for the project in the future.
3. The project should be close to the location of the original project, and if possible, be located upstream at a similar distance from the identified sensitive receptor. This distance should not be based on actual location, but on a similar hydraulic distance to the sensitive receptor.
4. Preference is given to one location that addresses any and all of the performance standards waived, rather than separate locations for each performance standard.
5. The project location must demonstrate no adverse impacts to other properties.

Mitigation projects for stormwater quantity proposed within the City of Burlington are:

1. Stormwater Outfall Retrofit

Provide Water Quality measures at existing stormwater outfalls within the same HUC14 under the guidance of the City Engineer. Review of each outfall condition should be reviewed with the City Engineer before selecting one or more of the following options:

- a. Outlet Structure Modifications (i.e.: Replacement of defective or installation of new Tide Gates to control floatable and suspended solids from entering the City's storm drainage system and being deposited)
- b. Installation of in-line or end-of-pipe Best Management Practice (BMP) as approved by the NJDEP to pretreat stormwater draining into an existing stormwater management basin

2. Bank Stabilization

Bank stabilization projects meeting the following criteria may be presented for review and approval by the City Engineer. Stabilization projects will be reviewed for the following benefits:

- a. Stabilization of eroded river banks where public or private property or structures are threatened.
- b. Reduced sediment deposition in the river.
- c. Improved water quality

3. Stormwater Recharge Systems

Construction of stormwater recharge systems in areas of the City with existing drainage problems can be addressed through compliance with the NJAC 7:8 Section 5 under the guidance of the City Engineer.

10.0 Summary

The Stormwater Management Plan presented for adoption on April 27, 2005 to the City of Burlington Land Use Board is required for the City of Burlington to meet the requirements of the Burlington City NJPDES MS4 permit. If adopted the stormwater management plan will become an element of the Burlington City Master Plan.

The ordinances included as Attachment 1 and 2 of the Appendixes of the City of Burlington **(1.)** Municipal Stormwater Management Plan must be reviewed and adopted by the City of Burlington Common Council prior to April 1, 2006 in order to go into effect and to meet the requirements of the Burlington City NJPDES MS4 permit.

A copy of the adopted City of Burlington Stormwater Management Plan will be submitted to Burlington County Planning for review and approval. The plan has been prepared in conformance with the Rancocas Watershed Management Plan and NJAC 7:8.

The City of Burlington Stormwater Management Plan represents the beginning of a new process in which municipalities participate in improving water quality conditions from non-point source pollution. The City of Burlington's Stormwater Management Plan will improve the non-point source pollution conditions to the Delaware River and the Assiscunk River Watershed.

(1.) There is no Attachment 2; the reference is erroneous.

Appendix

Maps 1- 9

**GROUNDWATER RECHARGE AND
WELLHEAD PROTECTION AREAS (WPAs)**



**MUNICIPAL STORMWATER MANAGEMENT PLAN
CITY OF BURLINGTON
BURLINGTON COUNTY, NEW JERSEY**

ENVIRONMENTAL RESOLUTIONS, INC. MOUNT LAUREL, NEW JERSEY

SOURCE:
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
EXPLORING NEW JERSEY'S WATERSHEDS
SERIES 2 VOLUME 2

This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by the NJDEP and is not state-authorized.



0 0.25 0.5 0.75 1

Miles
1 inch equals 1,700 feet.

Legend

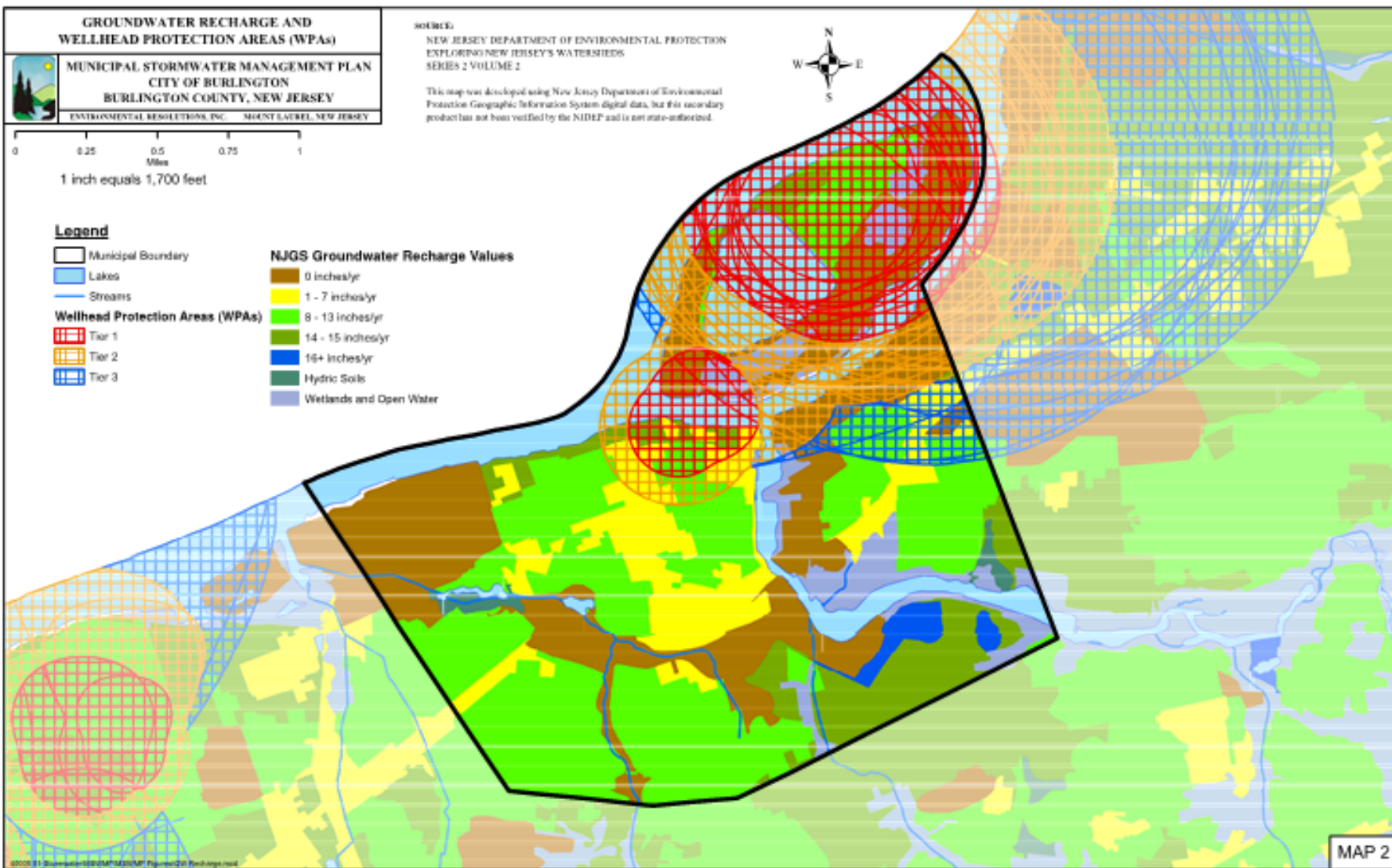
- Municipal Boundary
- Lakes
- Streams

Wellhead Protection Areas (WPAs)

- Tier 1
- Tier 2
- Tier 3

NJGS Groundwater Recharge Values

- 0 inches/yr
- 1 - 7 inches/yr
- 8 - 13 inches/yr
- 14 - 15 inches/yr
- 16+ inches/yr
- Hydric Soils
- Wetlands and Open Water



MAP 2

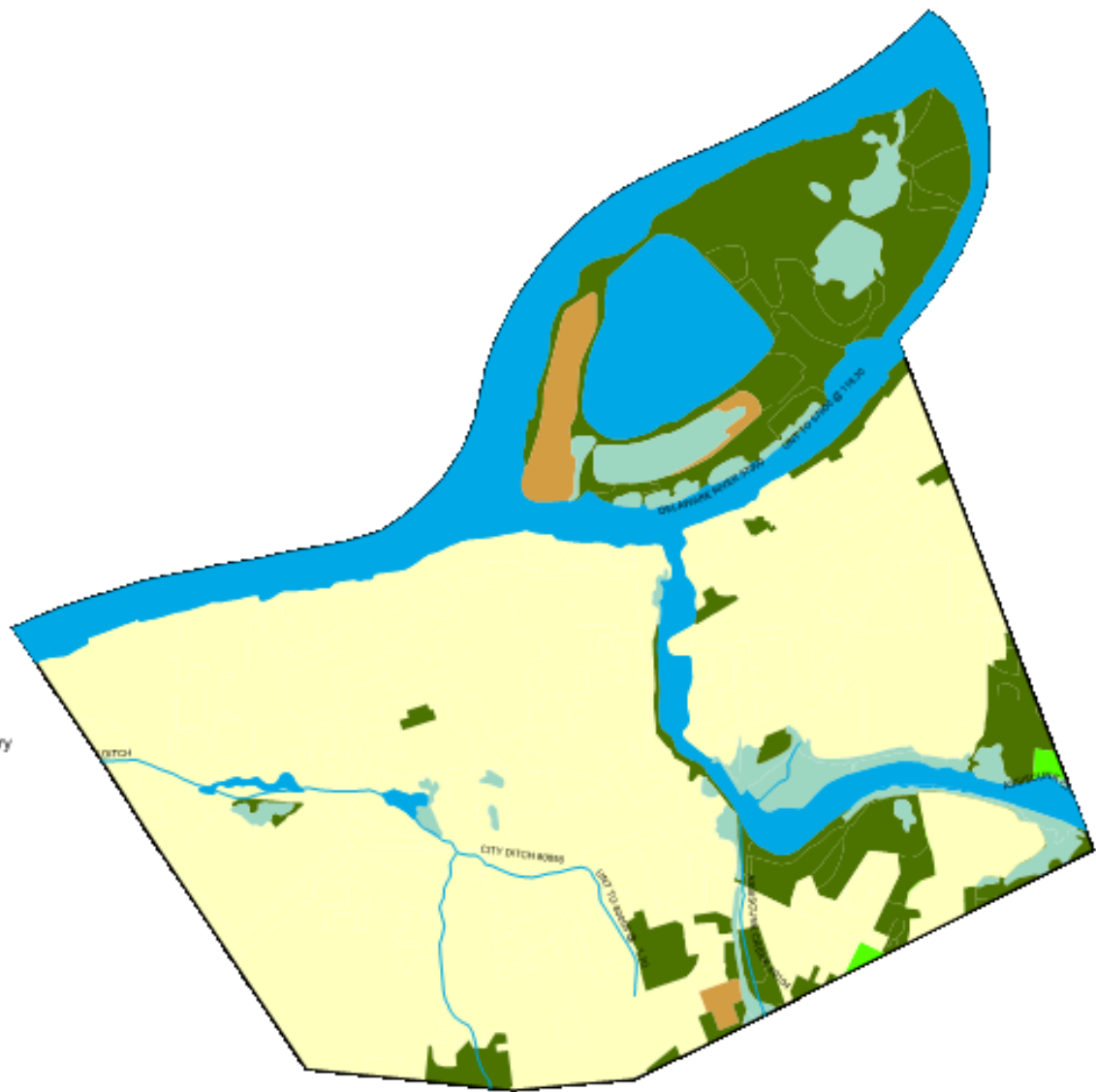


0 0.1 0.2 0.3 0.4 0.5
Miles

1 inch equals 1,500 feet

Legend

-  Municipal Boundary
-  Streams
- LAND USE**
-  AGRICULTURE
-  BARREN LAND
-  FOREST
-  URBAN
-  WATER
-  WETLANDS



SOURCE: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
EVALUATING NEW JERSEY'S WATERSHEDS
SERIES 1 VOLUME 2

This map was developed using New Jersey Department of Environmental
Protection Geographic Information System digital data, but this secondary
product has not been verified by the NJDEP and is not state-endorsed.

LAND USE - WETLANDS DESIGNATIONS



**MUNICIPAL STORMWATER MANAGEMENT PLAN
CITY OF BURLINGTON
BURLINGTON COUNTY, NEW JERSEY**

ENVIRONMENTAL RESOLUTIONS, INC. MOUNT LAUREL, NEW JERSEY



Watershed Management Areas

- 01. Upper Delaware
- 02. Wallkill
- 03. Pompton, Wanauque, Ramapo
- 04. Lower Passaic and Saddle
- 05. Hackensack and Passaic
- 06. Upper Passaic, Whippany, and Rockaway
- 07. Arthur Kill
- 08. North and South Branch Raritan
- 09. Lower Raritan, South River, and Lawrence
- 10. Millstone
- 11. Central Delaware
- 12. Monmouth
- 13. Barnegat Bay
- 14. Mullica
- 15. Great Egg Harbor
- 16. Cape May
- 17. Maurice, Salem, and Cohansaw
- 18. Lower Delaware
- 19. Rancocas
- 20. Assiscout, Crosewicks, and Doctors

LEGEND

- County Boundaries
- Watershed Boundaries
- Watershed Management Areas
- Water Regions**
- Northeast
- Raritan
- Atlantic Coastal
- Northwest
- Lower Delaware

SOURCE:
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
EXPLORING NEW JERSEY'S WATERSHEDS
SERIES 2 VOLUME 2

This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by the NJDEP and is not state-authorized.

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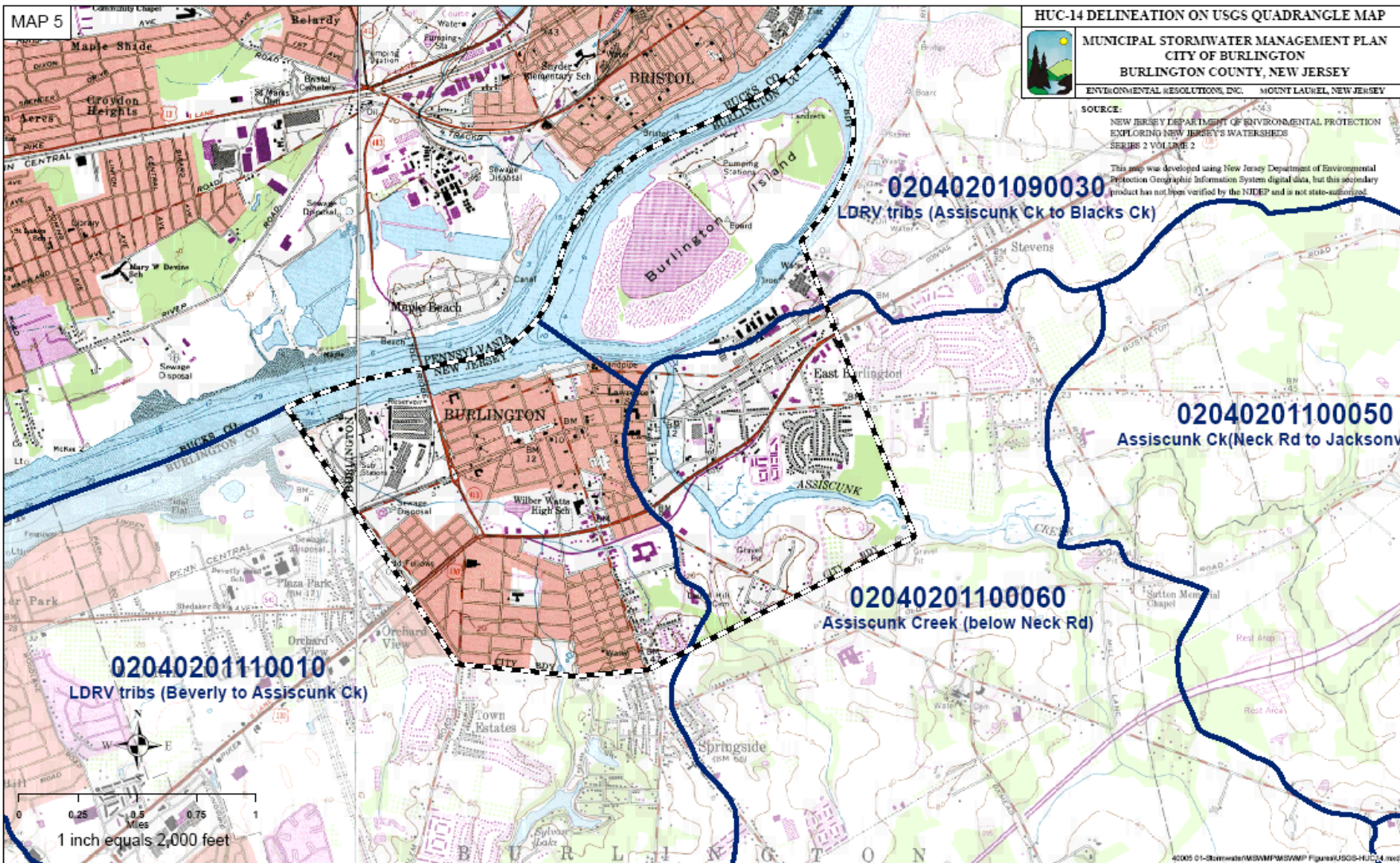
20

Miles



NEW JERSEY'S WATERSHED,
WATERSHED MANAGEMENT AREAS,
AND WATER REGIONS

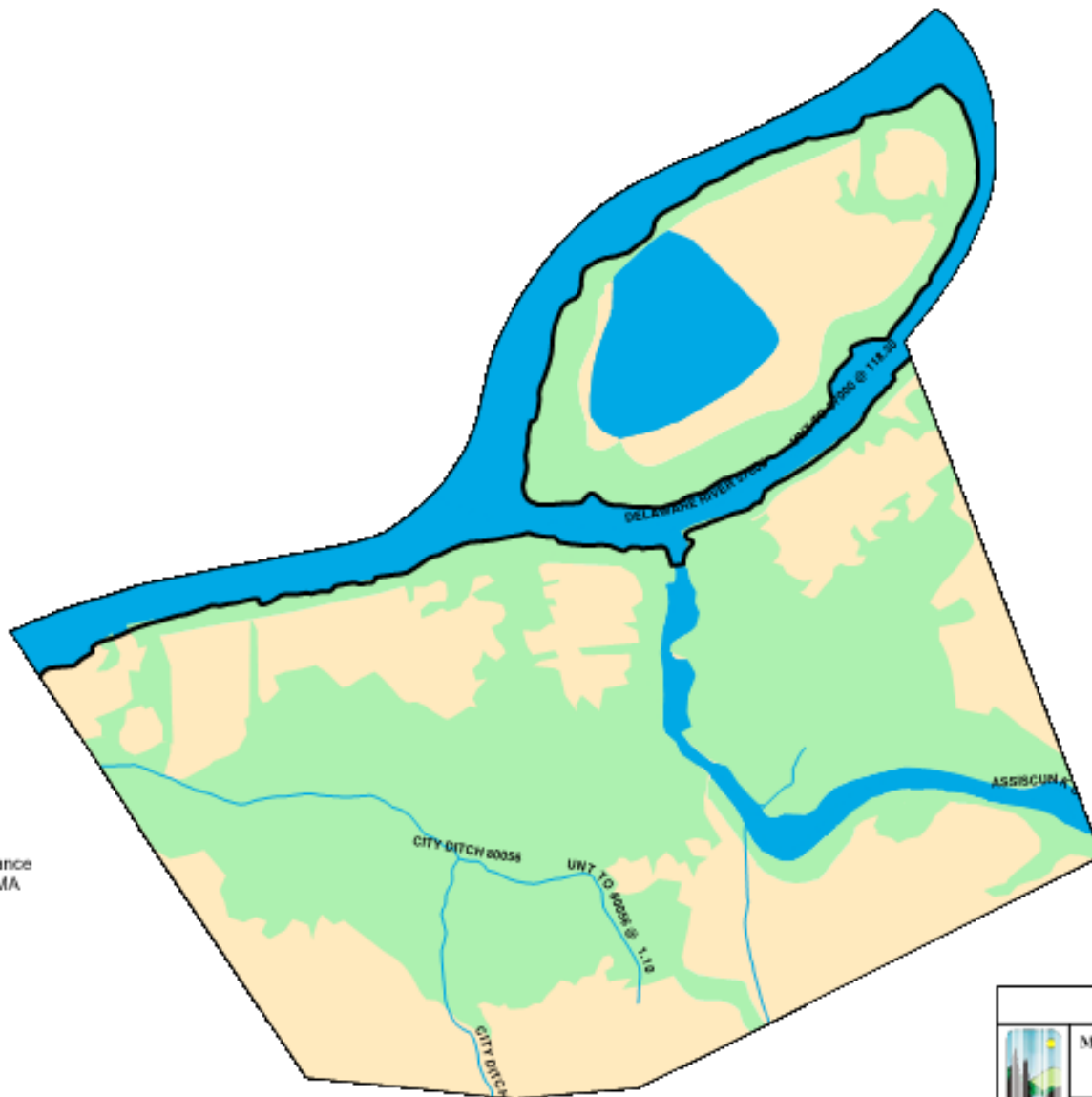
MUNICIPAL STORMWATER MANAGEMENT PLAN
ENVIRONMENTAL RESOLUTIONS, INC. MOUNT LAUREL, NEW JERSEY





0 0.1 0.2 0.3 0.4 0.5
Miles

1 inch equals 1,500 feet



Legend

- Municipal Boundary
- Flood Plain per Flood Insurance Rate Maps prepared by FEMA
- Water
- Not a Flood-prone Area
- Streams

SOURCE:
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
EXPLORE NEW JERSEY'S WATERSHEDS
SERIES 2 VOLUME 1

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FLOODPRONE AREAS



**MUNICIPAL STORMWATER MANAGEMENT PLAN
CITY OF BURLINGTON
BURLINGTON COUNTY, NEW JERSEY**

ENVIRONMENTAL RESOLUTIONS, INC. MOUNT LAUREL, NEW JERSEY

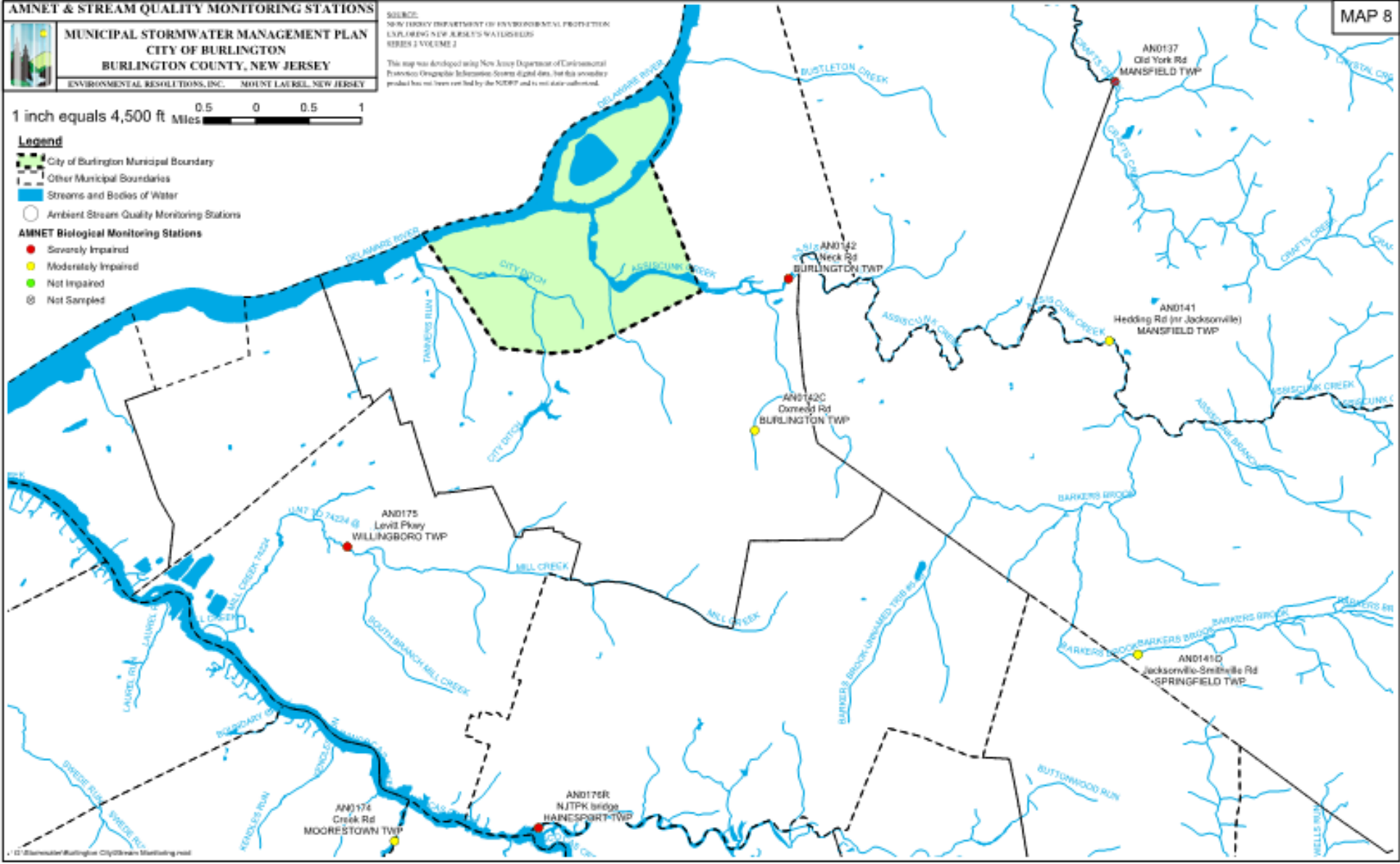
AMNET & STREAM QUALITY MONITORING STATIONS

MUNICIPAL STORMWATER MANAGEMENT PLAN
CITY OF BURLINGTON
BURLINGTON COUNTY, NEW JERSEY
 ENVIRONMENTAL RESOLUTIONS, INC. MOUNT LAUREL, NEW JERSEY

SOURCE:
 NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 EXPLORING NEW JERSEY'S WATERBODIES
 SERIES 1 VOLUME 1
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1 inch equals 4,500 ft Miles 0 0.5 1

- Legend**
- City of Burlington Municipal Boundary
 - Other Municipal Boundaries
 - Streams and Bodies of Water
 - Ambient Streams Quality Monitoring Stations
- AMNET Biological Monitoring Stations**
- Severely Impaired
 - Moderately Impaired
 - Not Impaired
 - Not Sampled





0 0.1 0.2 0.3 0.4 0.5
Miles

1 inch equals 1,500 feet

TOTAL DEVELOPABLE LAND
~607 Acres or 0.94 Square Miles



Legend

- Municipal Boundary
- Streams

Land Use

- AGRICULTURE
- BARREN LAND
- FOREST
- URBAN
- WATER
- WETLANDS

Developable Land

- Developable Land - No Environmental Constraints

SOURCE: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
EXPLORE NEW JERSEY'S WATERSHEDS
SERIES 2 VOLUME 2

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DEVELOPABLE LANDS MAP



MUNICIPAL STORMWATER MANAGEMENT PLAN
CITY OF BURLINGTON
BURLINGTON COUNTY, NEW JERSEY

ENVIRONMENTAL RESOLUTIONS, INC. MOUNT LAUREL, NEW JERSEY