TOWNSHIP OF HILLSIDE

MUNICIPAL STORMWATER MANAGEMENT PLAN

Township of Hillside
Hillside Avenue & Liberty Avenue
Hillside, New Jersey 07205

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Introduction

This Municipal Storm Water Management Plan (MSWMP) documents the strategy for Hillside Township 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, generally defined as projects that disturb one or more acre of land or projects which result in the construction of a quarter of an acre of new impervious surfaces. 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 base-flow in receiving water bodies. The Plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

A "build-out" analysis has not been included in this plan since there is a combined total of less than one square mile of vacant or agricultural lands within the Township of Hillside.

The plan also addresses the review and update of existing ordinances, the Township Master Plan and other planning documents to allow for project designs that include low impact development techniques.

The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standard 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 of the Municipal Storm Water Management Plan (MSWMP)

The goals of this Municipal Storm Water Management Plan are:

- Reduce flood damage, including damage to life and property;
- Minimize, to the extent practical, any increase in stormwater runoff from any new development;
- Reduce soil erosion from any development or construction project;
- Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- Maintain groundwater recharge;
- Prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- 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;
- Protect public safety through the proper design and operation of stormwater basins.

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 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.

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

Hillside Township is an established suburban community and encompasses 2.78 square miles in northeastern Union County, New Jersey. The two largest land use categories are residential and industrial. Most of Hillside Township has been developed and therefore the overall development pattern is not likely to change significantly. Any substantial new development would most likely be the redevelopment of older, antiquated buildings and properties. The population of Hillside Township slightly decreased from 21,440 in 1980 to 21,044 in 1990. The population then increased to 21,747 in 2000. Figure C-4 illustrates the waterways within the Township. Figure C-3 depicts the Township boundary on the USGS quadrangle maps.

The Elizabeth River forms the western boundary of Hillside Township. This waterway is listed on the New Jersey Integrated Water Quality Monitoring and Assessment Report. The Elizabeth River is identified on New Jersey's 2004 Integrated List of Waterbodies. A copy of the Sublist's identifying the Elizabeth River, site ID, pollutants, data source and priority ranking has been provided in the Appendix of this report. The Elizabeth River has received an impaired score based on NJDEP AMNET Studies. This means that the New Jersey Department of Environmental Protection (NJDEP) is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for each waterway.

The 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.

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 plans, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other Best Management Practices (BMP's).

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 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 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

In addition to water quality problems, Hillside Township has exhibited water quantity problems including flooding, stream bank erosion, and diminished base flow in its streams. Many of the culverts associated with road crossing in the Township are undersized. During severe storm events, these undersized culverts do not have adequate

capacity, thereby causing a backwater effect and flooding upstream. The following areas have been identified as streets which flood even during small rain events:

- Yale Avenue / intersection of Lehigh Place
- Baker Street
- Gurd Avenue
- State Highway Route 22 East at the Newark Border
- State Highway Route 22 West between Bloy Street and Cornell Place
- Coe Avenue and Robert Street
- Intersection of Highland Avenue & Hillside Avenue
- Conant Street under railroad bridge
- South State and St. Louis Avenue
- Central Avenue and Race Street

These culverts were designed for much different hydrologic conditions (i.e., less impervious area) than presently exist in the Township. As additional impervious surfaces increased over the years within Hillside Township, as well as neighboring municipalities, the peak and volumes of stream flows also increased. The increased amount of water resulted in stream bank erosion, which resulted in unstable areas at roadway/bridge crossing, and degraded stream habitats. The high percentage of impervious surfaces within Hillside Township has significantly decreased groundwater recharge, decreasing base flows in streams during dry weather periods. Lower base flows can have a negative impact on instream habitat during the summer months. A map of groundwater recharge areas are shown on figure C-5. The information on the map is provided by the NJ Geological Survey Agency within the NJDEP. The map shows that the range of average annual recharge is expected to be from 0" to 15" within the Township. New development subject to the groundwater recharge requirements of the NJDEP Stormwater Rules shall maintain the average annual recharge associated with the site or use other NJDEP Best Management Practices to address groundwater recharge requirements.

The Township of Hillside is within the Metropolitan Planning Area (PA1) as delineated in the New Jersey State Plan Policy Map. Metropolitan Planning Areas provide for much of the state's future redevelopment. In accordance with the NJDEP Stormwater Rules (N.J.A.C. 7:8), any redevelopment of previously disturbed areas does not count towards the threshold requirements. The redevelopment of new impervious surfaces constructed on top of existing impervious surfaces is not required to meet the rules. Any impervious surface placed outside of the existing impervious surfaces counts towards the threshold and is considered "new". For the redevelopment of existing impervious surfaces the required TSS removal either equal to the existing stormwater treatment system or a 50% TSS removal rate whichever is greater. For new impervious surfaces an 80% (or 95%) TSS removal rate applies to all new impervious surface except that point discharges within the Special Water Resource Protection Area must meet the 95% TSS removal rate stipulated by the Rule.

Wellhead protection areas, required as part of the MSWMP, are shown in Figure C-2.

Design and Performance Standards

Hillside Township is adopting the design and performance standards for stormwater management 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 to the county for review and approval within two years.

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

Plan Consistency

Hillside Township is not within a Regional Stormwater Management Planning Area and no TMDLs have been developed for waters within the Township; therefore the Stormwater Management Plan does not need to be consistent with any Regional Stormwater Management Plans (RSWMPs) nor any TMDLs. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

The Municipal Storm Water Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. Hillside Township will utilize the RSIS in the stromwater management review of residential areas. The Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

Hillside Township's Stormwater Management Ordinance will be updated to require 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

Hillside Township is in the process of reviewing the master plan and land use ordinances and has provided a list of the sections in the Township Land Use Ordinances that are being recommended to be modified to incorporate nonstrucutural stormwater management strategies. These are the ordinances identified for revision. Once the ordinance texts are completed, the ordinances will be submitted to the county review agency for review and approval within two years of the official adoption of the Stormwater Rules. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapter 188 of the Hillside Ordinances is identified as Land Use, was reviewed with regard to incorporating nonstructural stormwater management strategies. The following amendments are being recommended to the following sections:

Section 188-9. Improvements and Design Standards. H. Drainage System.

It is recommended that this section is amended to require all development to conform to Hillside Township's Storm Water Management Plan and the requirements of the Stormwater Rules N.J.A.C. 7:8.

Section 188-37.K.(1)(m) Utilities.

It is recommended that a subsection [4] is added stating that "All development shall conform to Hillside Township's Storm Water Management Plan and the requirements of the Stormwater Rules N.J.A.C. 7:8".

Impervious Lot Coverage.

The Township Land Use Ordinances do not provide for a maximum impervious lot coverage requirement for any of the residential zone districts. It is recommended that each of the six residential zone districts include a maximum impervious lot coverage requirement to ensure that a portion of each property is maintained as open, landscape or grass area. The non-residential zone districts should also be amended to include a maximum impervious lot coverage requirement. It is also recommended that all property owners who request a variance to exceed the impervious lot coverage requirements be required to mitigate the impact of the additional impervious surfaces in accordance with the Township Storm Water Management Plan.

Land Use/Build-Out Analysis

If a municipality can document that it has a combined total of less than one square mile of vacant or agricultural lands, the municipality is not required to complete build-out analysis.

Based on a visual inspection of the most recent aerial photographs of Hillside Township, it appears that the Township of Hillside will satisfy this requirement as the total land area of the Township is 2.78 square miles and the majority of the township has been developed.

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. The following is a hierarchy of options:

Mitigation Project Criteria

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.

The developer 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 can be obtained from the Township Engineer. Listed below are specific projects that can be used to address the mitigation requirement.

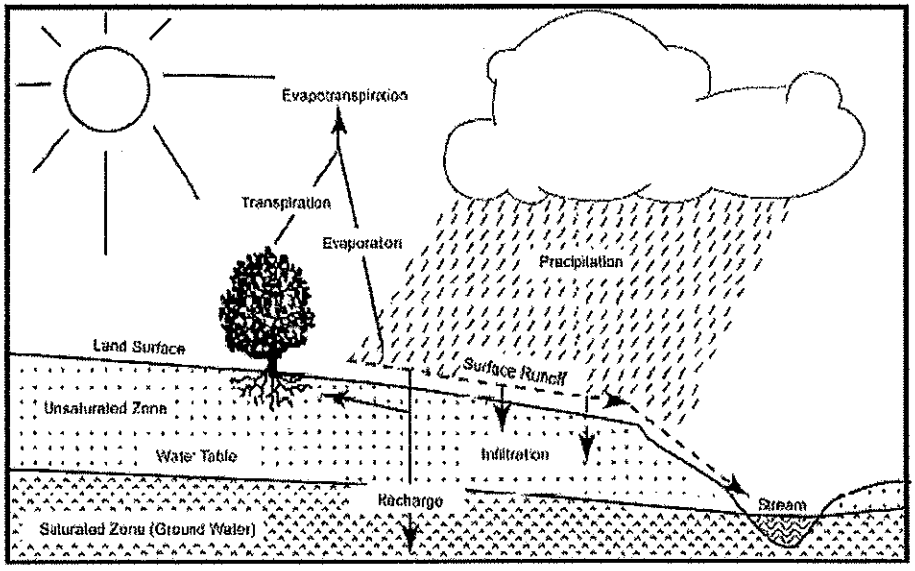
The list of mitigation projects is as follows:

1. Design and construction of a separate storm sewer system where there currently exists a combined sanitary and storm sewer system.
2. Retrofit existing municipal parking lots with water quality BMP devices.
3. Municipal storm sewer cleaning and repair.
4. Construction of vegetated filter strips on municipal properties.

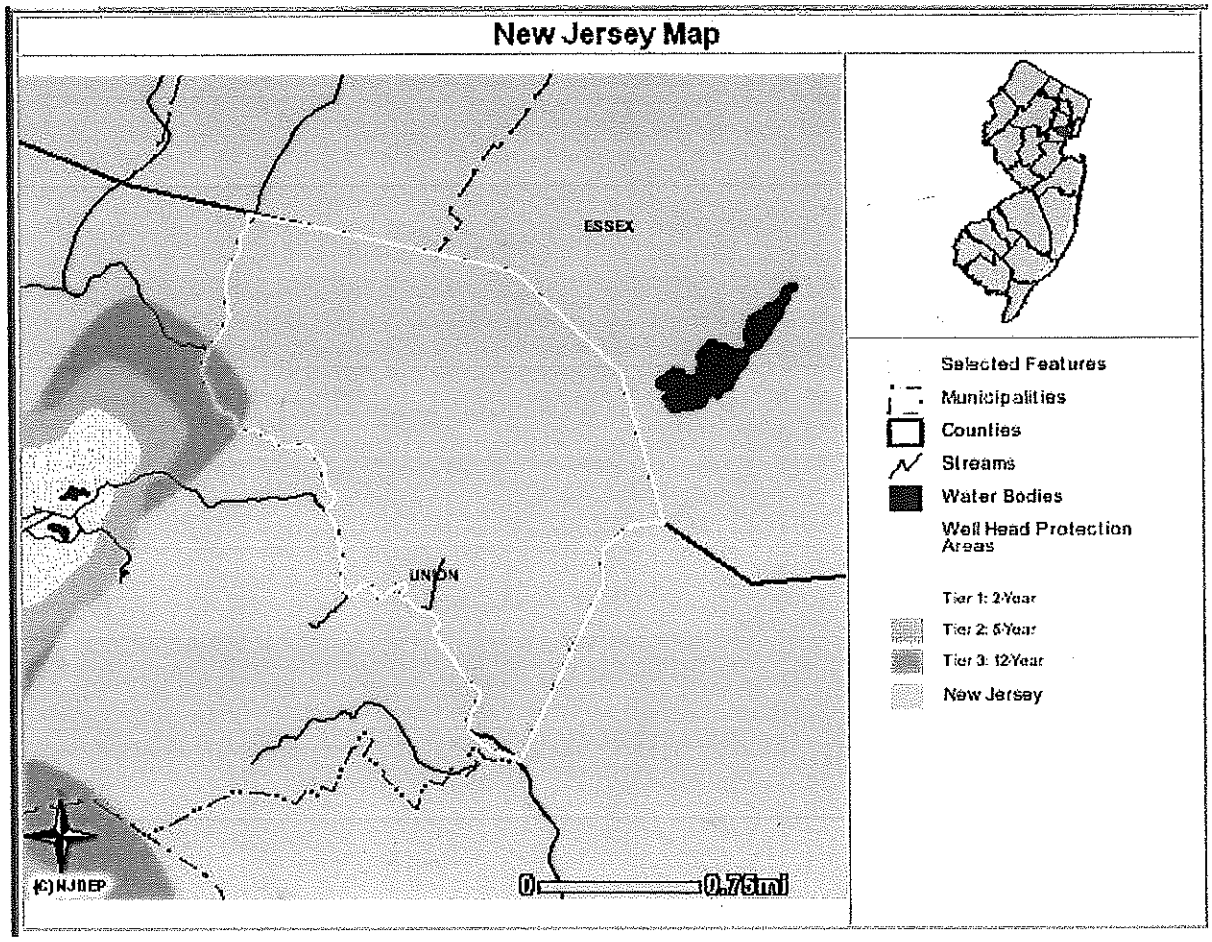
If a suitable site cannot be located in the same drainage area as the proposed development, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addressed the same issue. For example, if a variance is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to fecal impairment.

The township may allow a developer to provide funding or partial funding 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 that 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-1: Groundwater Recharge in the Hydrologic Cycle

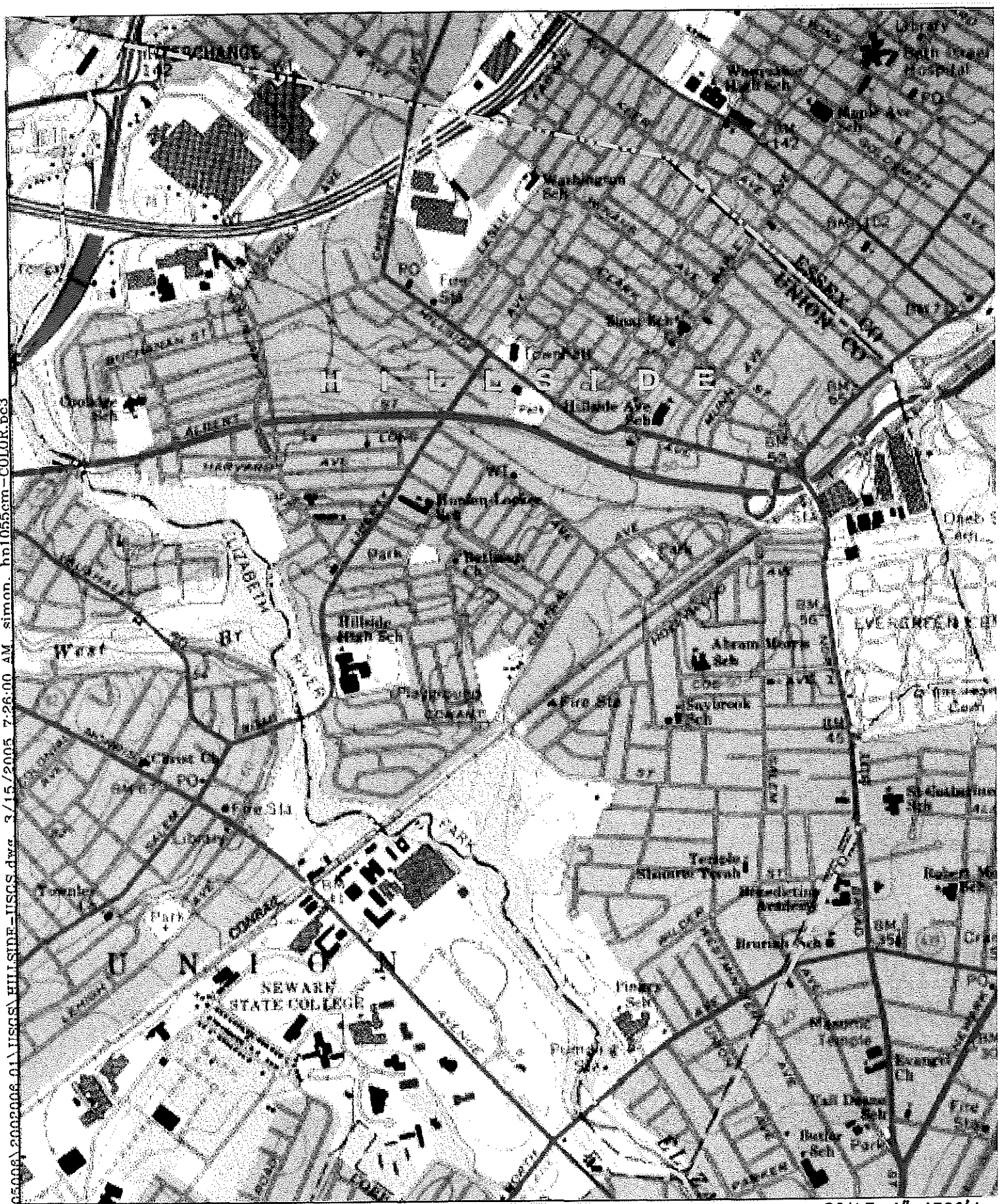


Source: New Jersey Geological Survey Report GSR-32.



WELLHEAD PROTECTION AREAS IN HILLSIDE TOWNSHIP

FIGURE C-2



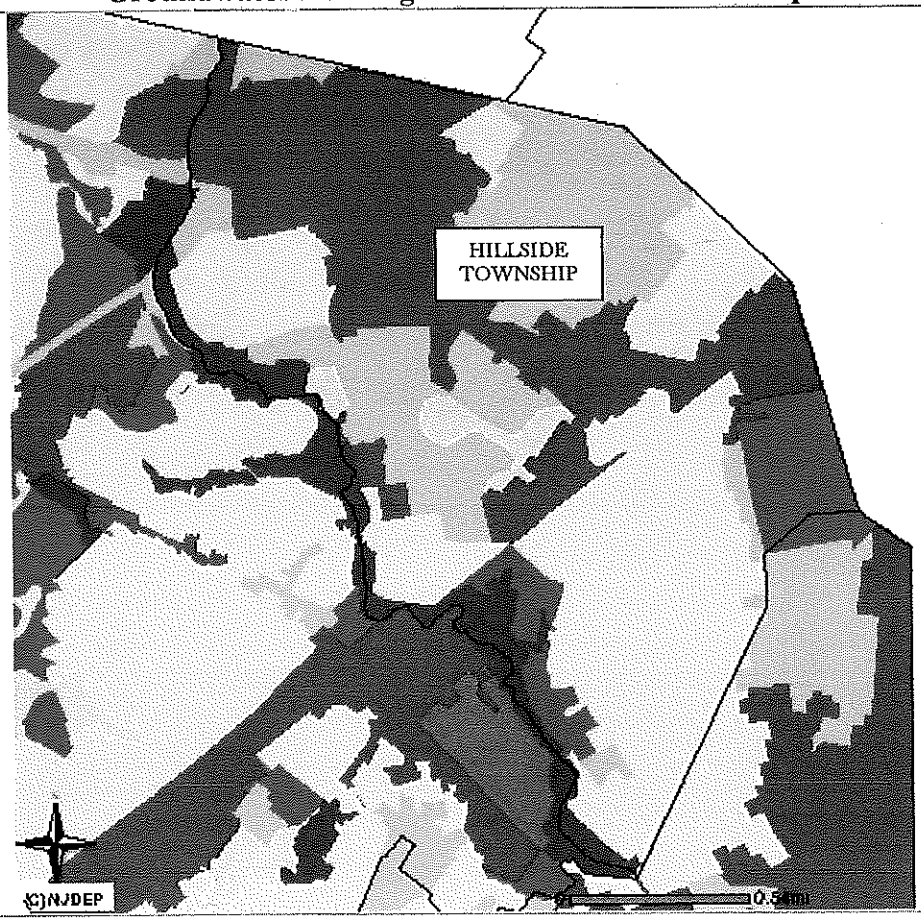
SOURCE: USGS TOPO- ELIZABETH QUAD

FIGURE C-3

SCALE: 1"=1500'±

F:\2005008\2002006.01\USGS\HILLSIDE-USGS.dwg 3/15/2005 7:26:00 AM simon, hp1055cm-COLOR.pc3

Groundwater Recharge Areas in Hillside Township



Municipalities

Ground-Water Recharge

- 16 to 23 in/yr
- 11 to 15 in/yr
- 8 to 10 in/yr
- 1 to 7 in/yr
- 0 in/yr
- Hydric Soils
- Wetlands and Open Water
- No Recharge Calculated

FIGURE C-5

APPENDIX

Sublist 4

New Jersey's 2004 Integrated List of Waterbodies

June 1, 2005

Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
Northwest	01	Cranberry Lake-01	Cranberry Lake	Phosphorus, Mercury	Sussex Co HD, NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Raritan	10	Cranbury Brook near Prospect Plains	01400690	Fecal Coliform	NJDEP/USGS Data, EWQ
Lower Delaware	20	Crosswicks Creek at Extonville	01464500, 20-CRO-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
Lower Delaware	20	Crosswicks Creek at Groveville Rd at Groveville	01464504, 20-CRO-2	Fecal Coliform	NJDEP/USGS Data, Metal Recon
Lower Delaware	20	Crosswicks Creek at Walnford Rd in Upper Freehold	2	Fecal Coliform	Monmouth Co HD
Raritan	09	Davidsons Mill Pond-09	Davidsons Mill Pond	Phosphorus	NJDEP Clean Lakes, Freshwater Fisheries
Northeast	06	Dead River near Millington	01379200	Fecal Coliform	NJDEP/USGS Data
Atlantic Coast	12	Deal Lake-12	1, Deal Lake	Phosphorus	NJDEP Clean Lakes, Monmouth Co HD
Northeast	04	Deepavaal Brook at Fairfield	01389138	Fecal Coliform	NJDEP/USGS Data
Delaware	18	Delaware River Zone 2	Delaware River Zone 2	1,2-Dichloroethane, Tetrachlorethylene, PCBs	DRBC, NJDEP Fish Tissue Monitoring
Delaware	18	Delaware River Zone 3	Delaware River Zone 3	1,2-Dichloroethane, Tetrachlorethylene, PCBs	DRBC, NJDEP Fish Tissue Monitoring
Delaware	18	Delaware River Zone 4	Delaware River Zone 4	1,2-Dichloroethane, Tetrachlorethylene, PCBs	304(l), DRBC, NJDEP Fish Tissue Monitoring
Delaware	20	Delaware River Zone 5	Delaware River Zone 5	PCBs	DRBC, NJDEP Fish Tissue Monitoring
Raritan	09	Devoe Lake-09	Devoe Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Fish Tissue Monitoring
Northeast	04	Diamond Brook at Fair Lawn	01389860	Fecal Coliform	NJDEP/USGS Data
Lower Delaware	20	Doctors Creek at Allentown	01464515	Fecal Coliform	NJDEP/USGS Data
Northwest	02	Double Kill at Waywayanda	01368820	Fecal Coliform	NJDEP/USGS Data
Northwest	01	Dry Brook at Rt 519 near Branchville	01443370, EWQ0020	Fecal Coliform	NJDEP/USGS Data, EWQ
Raritan	10	Duck Pond Run at Clarksville	01401200	Fecal Coliform	Monmouth Co HD, NJDEP/USGS Data
Raritan	07	Echo Lake-07	Echo Lake	Phosphorus	NJDEP Clean Lakes
Raritan	07	Elizabeth River at Ursino Lake in Elizabeth	01393450, 7-ELI-2	Fecal Coliform,	NJDEP/USGS Data, Metal Recon
Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Fecal Coliform	NJDEP/USGS Data, Metal Recon
Atlantic Coast	12	Franklin Lake-12	Franklin Lake	Phosphorus	NJDEP Clean Lakes
Northwest	01	Ghost Lake-01	Ghost Lake	Phosphorus	NJDEP Clean Lakes
Lower Delaware	17	Giampietro Lake-17	Giampietro Lake	Phosphorus	NJDEP Clean Lakes
Northeast	04	Goffle Brook at Hawthorne	01389850	Fecal Coliform	NJDEP/USGS Data
Atlantic Coast	15	Great Egg Harbor River at Weymouth	01411110, 15-GEH-3	Fecal Coliform	NJDEP/USGS Data, Metal Recon
Raritan	09	Green Brook at North Plainfield	01403470	Fecal Coliform	NJDEP/USGS Data

Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
Raritan	10	Duck Pond Run at Clarksville	01401200	Phosphorus, pH, Dissolved Oxygen, Dissolved Solids, Total Suspended Solids, Arsenic, Cadmium, Chromium,Copper, Lead, Mercury, Nickel, Selenium, Zinc	Monmouth Co HD, NJDEP/USGS Data
Raritan	10	Duck Pond Run at Rt 1 in West Windsor	AN0394	Benthic Macroinvertebrates	NJDEP AMNET
Raritan	09	Dukes Brook at Dukes Pkwy in Hillsborough	AN0375	Benthic Macroinvertebrates	NJDEP AMNET
Northwest	01	Dunnfield Creek at Dunnfield	01442760	Arsenic, Cadmium, Lead, Mercury, Silver, Zinc	NJDEP/USGS Data
Atlantic Coast	16	East Creek Pond-16	East Creek Pond	Phosphorus	NJDEP Clean Lakes
Atlantic Coast	13	Echo Lake at Maxim-Southard Rd In Howell	67	pH, Total Suspended Solids	Monmouth Co HD
Lower Delaware	18	Edwards Run at Pitman - Jefferson Rd in Harrison	AN0673	Benthic Macroinvertebrates	NJDEP AMNET
Atlantic Coast	14	Egg Harbor City Lake-14	Egg Harbor City Lake (Eastside) and (Westside), LINLAKED	Pineland Biological Community	Denville HD, Pinelands
Raritan	07	Elizabeth River at Ursino Lake in Elizabeth	01393450, 7-ELI-2	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, thallium, Zinc	NJDEP/USGS Data, Metal Recon
Raritan	07	Elizabeth River on Columbia Ave in Hillside	7-ELI-1	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, thallium, Zinc, Thallium	NJDEP Metal Recon
Raritan	07	Elizabeth River W Br at Vaux Hall Rd in Union	AN0202	Benthic Macroinvertebrates	NJDEP AMNET
Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	pH, Dissolved Oxygen, Dissolved Solids, Arsenic, Thallium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Elliots Creek at Bremen Ave in Galloway	AN0591, LELIOBRE	Pineland Biological Community	NJDEP AMNET, Pinelands
Lower Delaware	18	Evans Lake-18	Evans Lake	Phosphorus	NJDEP Clean Lakes
Atlantic Coast	13	Factory Branch at Whiting Lacey Rd in Lacey	AN0547	Benthic Macroinvertebrates	NJDEP AMNET
Atlantic Coast	15	Faraway Branch at Jackson Rd in Monroe	AN0629	Benthic Macroinvertebrates	NJDEP AMNET
Raritan	09	Farrington Lake-09	Farrington Lake	Phosphorus	NJDEP Clean Lakes, NJDEP Freshwater Fisheries
Atlantic Coast	14	Featherbed Branch below Carranza Rd	WFEACARR	Pineland Biological Community	Pinelands
Raritan	08	First Neshanic River at Rt 31 in Raritan	AN0330	Benthic Macroinvertebrates	NJDEP AMNET
Atlantic Coast	13	Forked River N Br at powerlines in Lacey	AN0551	Benthic Macroinvertebrates	NJDEP AMNET
Atlantic Coast	15	Four Mile Branch at Malaga Rd (Rt 536) in Monroe	AN0622	Benthic Macroinvertebrates	NJDEP AMNET
Lower Delaware	17	Foxmill Lake-17	Foxmill Lake	Phosphorus	NJDEP Clean Lakes
Lower Delaware	19	Friendship Creek at Friendship Rd in Tabernacle	AN0152, SFRPOWEL	Pineland Biological Community	NJDEP AMNET, Pinelands
Lower Delaware	19	Friendship Creek at Irick's Causeway	SFRIRICK	Pineland Biological Community	Pinelands

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New Jersey's 2004 Integrated List of Waterbodies

June 1, 2005

Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
Lower Delaware	18	Edwards Run at Jefferson	01475090	Phosphorus, Fecal Coliform	NJDEP/USGS Data
Lower Delaware	18	Edwards Run at Jessups Mill Rd in Mantua	AN0674	Benthic Macroinvertebrates	NJDEP AMNET
Raritan	07	Elizabeth River at Lakeview Rd & Maple Terr in Union	AN0202X	Benthic Macroinvertebrates	NJDEP AMNET
Raritan	07	Elizabeth River at Summer St in Hillside	AN0204X	Benthic Macroinvertebrates	NJDEP AMNET
Raritan	07	Elizabeth River at Ursino Lake in Elizabeth	01393450, 7-ELI-2	Phosphorus, Dissolved Solids	NJDEP/USGS Data, Metal Recon
Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Phosphorus	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Elm(James) Lake-14	NGREAR30	Pineland Biological Community	Pinelands
Northeast	03	Erskine Lake-03	Erskine Little Beach, Main Beach, and Upper Beach	Fecal Coliform	Passaic Co HD
Raritan	10	Etra Lake-10	Etra Lake	Phosphorus	NJDEP Clean Lakes
Lower Delaware	18	Evans Pond-18	Evans Pond	PCBs, Dioxin	NJDEP Fish Tissue Monitoring
Atlantic Coast	16	Fishing Creek at Rio Grande	01411400	pH	NJDEP/USGS Data
Atlantic Coast	16	Fishing Creek at Rt 47 in Middle	AN0771	Benthic Macroinvertebrates	NJDEP AMNET
Atlantic Coast	16	Fishing Creek Estuary	Fishing Creek Estuary	Total Coliform	NJDEP Shellfish Monitoring
Atlantic Coast	12	Flat Creek at Middle Rd in Hazlet	AN0459	Benthic Macroinvertebrates	NJDEP AMNET
Northeast	03	Forest Hill Lake-03	Forest Hill Park Beach, Forest Hill Park Inlet	Fecal Coliform	Passaic Co HD
Northwest	01	Forest Lake-01	Forest Lake: Boardwalk Beach, Cove Beach, Harbor View Beach, Main Beach	Fecal Coliform	Sussex Co HD
Atlantic Coast	13	Forked River Estuary	1661	Total Coliform	NJDEP Shellfish Monitoring
Lower Delaware	17	Fortescue Creek Estuary	3840L, 3862E, 3862G, 3862H, 3841K, 3841L, 3841M	Total Coliform	NJDEP Shellfish Monitoring
Northwest	01	Fox Hollow Lake-01	Fox Hollow Lake	Fecal Coliform	Sparta Twp HD
Northeast	06	Foxs Pond-06	Park Lake Beach, Inlet, and Swim Lanes	Fecal Coliform	Randoph Twp HD
Lower Delaware	17	Franklinville Lake-17	Franklinville Lake	Fecal Coliform	Gloucester Co HD
Northwest	01	Furnace Brook at Pequest Rd in White	AN0042	Benthic Macroinvertebrates	NJDEP AMNET
Northwest	01	Furnace Lake-01	Furnace Lake Beach	Fecal Coliform	Warren Co HD
Northeast	04	Goffle Brook at Wagaraw Rd in Hawthorne	AN0277	Benthic Macroinvertebrates	NJDEP AMNET
Atlantic Coast	12	Gravelly Brook at Church St in Aberdeen	AN0457	Benthic Macroinvertebrates	NJDEP AMNET
Atlantic Coast	12	Gravelly Brook at Lloyd Rd in Marlboro	20	Phosphorus	Monmouth Co HD
Atlantic Coast	14	Great Bay	Great Bay-1,2,3	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring
Northeast	06	Great Brook at Woodland Rd (Gr Swamp WMA) in Harding	AN0219	Benthic Macroinvertebrates	NJDEP AMNET
Atlantic Coast	15	Great Egg Harbor	Great Egg Harbor-1, 4 thru 11, and 13 thru 14	Total Coliform	NJDEP Coastal Monitoring, Shellfish Monitoring

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New Jersey's 2004 Integrated List of Waterbodies

June 1, 2005

Wtrshd Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
Atlantic Coast	16	Edward Creek Estuary	3011c	Total Coliform	NJDEP Shellfish Monitoring
Lower Delaware	18	Edwards Run at Jefferson	01475090	Temperature, Dissolved Oxygen, pH, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
Atlantic Coast	14	Egg Harbor City Lake-14	Egg Harbor City Lake (Eastside) and (Westside), LINLAKED	Fecal Coliform	Denville HD, Pinelands
Raritan	08	Electric Brook at Fairview Ave in Washington	AN0314	Benthic Macroinvertebrates	NJDEP AMNET
Raritan	07	Elizabeth River at North Ave in Hillside	AN0204	Benthic Macroinvertebrates	NJDEP AMNET
Raritan	07	Elizabeth River at Ursino Lake in Elizabeth	01393450, 7-ELI-2	Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, Metal Recon
Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Temperature, Nitrate, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Zinc	NJDEP/USGS Data, Metal Recon
Lower Delaware	17	Elmer Lake-17	Elmer Lake	Fish Community	NJDEP Freshwater Fisheries
Northeast	06	Estling Lake-06	Estling Lake	Fecal Coliform	Sussex Co HD
Northwest	01	Fairview Lake-01	Fairview Lake YMCA, Fairview Lake: Blue Mt. Day Camp	Fecal Coliform	Passaic Co HD
Northeast	03	Farm Crest Acres-03	Farm Crest Acres Assoc.	Fecal Coliform	Sparta Twp HD
Raritan	09	Farrington Lake-09	Farrington Lake	Fish Community	NJDEP Clean Lakes, NJDEP Freshwater Fisheries
Northwest	02	Fawn Lake-02	Fawn Lake	Fecal Coliform	Burlington Co HD
Atlantic Coast	14	Featherbed Branch impoundment below Carranza Rd (Lake 1768-14)	WFEIMPD1	Pineland Biological Community	Pinelands
Atlantic Coast	16	Fishing Creek at Rio Grande	01411400	Phosphorus, Fecal Coliform, Temperature, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
Lower Delaware	19	Flamingo Lake-19	Clubhouse Marlton Lake Civic Assn., East Lake Marlton Lake Civic Assn.	Fecal Coliform	Sussex Co HD
Northwest	01	Flat Brook at Rt 615 in Walpack	AN0007, AN0008	Benthic Macroinvertebrates	NJDEP AMNET
Northwest	01	Flat Brook near Flatbrookville	01440000, DRBC/NPS32	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data, DRBC
Atlantic Coast	13	Forked River N Br near Forked River	01409050	Phosphorus, Fecal Coliform, Temperature, pH, Dissolved Oxygen, Nitrate, Disolved Solids, Total Suspended Solids, Unionized Ammonia	NJDEP/USGS Data
Atlantic Coast	13	Forked River N Br-Tidal	R13	Dissolved Oxygen	NJDEP Coastal Monitoring
Atlantic Coast	13	Forked River S Br-Tidal	R14	Dissolved Oxygen	NJDEP Coastal Monitoring
Atlantic Coast	13	Four Mile Branch at Oxycocus St in Stafford	AN0554	Benthic Macroinvertebrates	NJDEP AMNET
Northeast	03	Franklin Lake-03	Indian Trail Club Lakes 1 through 12	Fecal Coliform	Bergen Co HD

Appendix I B — Approved 2004 List of Impaired Waterbodies (By Waterbody/Parameter) With Priority Ranking

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Atlantic Coast	16	East Creek Lake-16	East Creek Lake	Mercury	High	NJDEP Fish Tissue Monitoring
Lower Delaware	17	Eastern Gate Lake-17	Eastern Gate Lake	Fecal Coliform	High	Gloucester Co HD
Northeast	03	Echo Lake-03	Echo Lake Reservoir	Mercury	High	NJDEP Freshwater Fisheries, Atlantic Co HD, NJDEP Fish Tissue Monitoring
Raritan	09	Edmunds Creek	Adjacent to Mill Brook at 02030105-059-0.00; Trib to Lower Raritan River	PCBs	High	Remanded 303d List, (F.R. V.66, #195, 10/9/01)
Lower Delaware	18	Edwards Run at Jefferson	01475090	Fecal Coliform	High	NJDEP/USGS Data
Lower Delaware	18	Edwards Run at Jefferson	01475090	Phosphorus	Medium	NJDEP/USGS Data
Lower Delaware	18	Edwards Run at Jessups Mill Rd in Mantua	AN0674	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Elizabeth River at Lakeview Rd & Maple Terr in Union	AN0202X	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Elizabeth River at Summer St in Hillside	AN0204X	Benthic Macroinvertebrates	Low	NJDEP AMNET
Raritan	07	Elizabeth River at Ursino Lk at Elizabeth	01393450, 7-ELI-2	Dissolved Solids	Medium	NJDEP/USGS Data, Metal Recon
Raritan	07	Elizabeth River at Ursino Lk at Elizabeth	01393450, 7-ELI-2	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Raritan	07	Elizabeth River W Br near Union	01393350, 7-WBE-1	Phosphorus	Medium	NJDEP/USGS Data, Metal Recon
Atlantic Coast	14	Elm(James) Lake-14	NGREAR30	Pineland Biological Community	Low	Pinelands
Northeast	03	Erskine Lake-03	Erskine Little Beach, Main Beach, and Upper Beach	Fecal Coliform	High	Passaic Co HD
Raritan	10	Etra Lake-10	Etra Lake	Phosphorus	Medium	NJDEP Clean Lakes
Lower Delaware	18	Evans Pond-18	Evans Pond	Dioxin	High	NJDEP Fish Tissue Monitoring
Lower Delaware	18	Evans Pond-18	Evans Pond	PCBs	High	NJDEP Fish Tissue Monitoring
Atlantic Coast	16	Fishing Creek at Rio Grande	01411400	pH	Medium	NJDEP/USGS Data
Atlantic Coast	16	Fishing Creek at Rt 47 in Middle	AN0771	Benthic Macroinvertebrates	Low	NJDEP AMNET
Atlantic Coast	16	Fishing Creek Estuary	Fishing Creek Estuary	Total Coliform	High	NJDEP Shellfish Monitoring
Atlantic Coast	12	Flat Creek at Middle Rd in Hazlet	AN0459	Benthic Macroinvertebrates	Low	NJDEP AMNET
Northeast	03	Forest Hill Lake-03	Forest Hill Park Beach, Forest Hill Park Inlet	Fecal Coliform	High	Passaic Co HD
Northwest	01	Forest Lake-01	Forest Lake: Boardwalk Beach, Cove Beach, Harbor View Beach, Main Beach	Fecal Coliform	High	Sussex Co HD
Atlantic Coast	13	Forked River Estuary	1661	Total Coliform	High	NJDEP Shellfish Monitoring
Lower Delaware	17	Fortescue Creek Estuary	3840L, 3862E, 3862G, 3862H, 3841K, 3841L, 3841M	Total Coliform	High	NJDEP Shellfish Monitoring
Northwest	01	Fox Hollow Lake-01	Fox Hollow Lake	Fecal Coliform	High	Sparta Twp HD
Northeast	06	Foxs Pond-06	Park Lake Beach, Inlet, and Swim Lanes	Fecal Coliform	High	Randoph Twp HD
Lower Delaware	17	Franklinville Lake-17	Franklinville Lake	Fecal Coliform	High	Gloucester Co HD