BOROUGH OF ISLAND HEIGHTS

STORMWATER MANAGEMENT PLAN

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Introduction

This Municipal Stormwater Management Plans (MSWMP) documents the strategy for the Borough of Island Heights ("the Borough") 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 projects that disturb more than 5,000 square feet of land or 5,000 square feet of impervious coverage.

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 plan also addresses the review and update of existing ordinances, the Borough 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 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:

- 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.

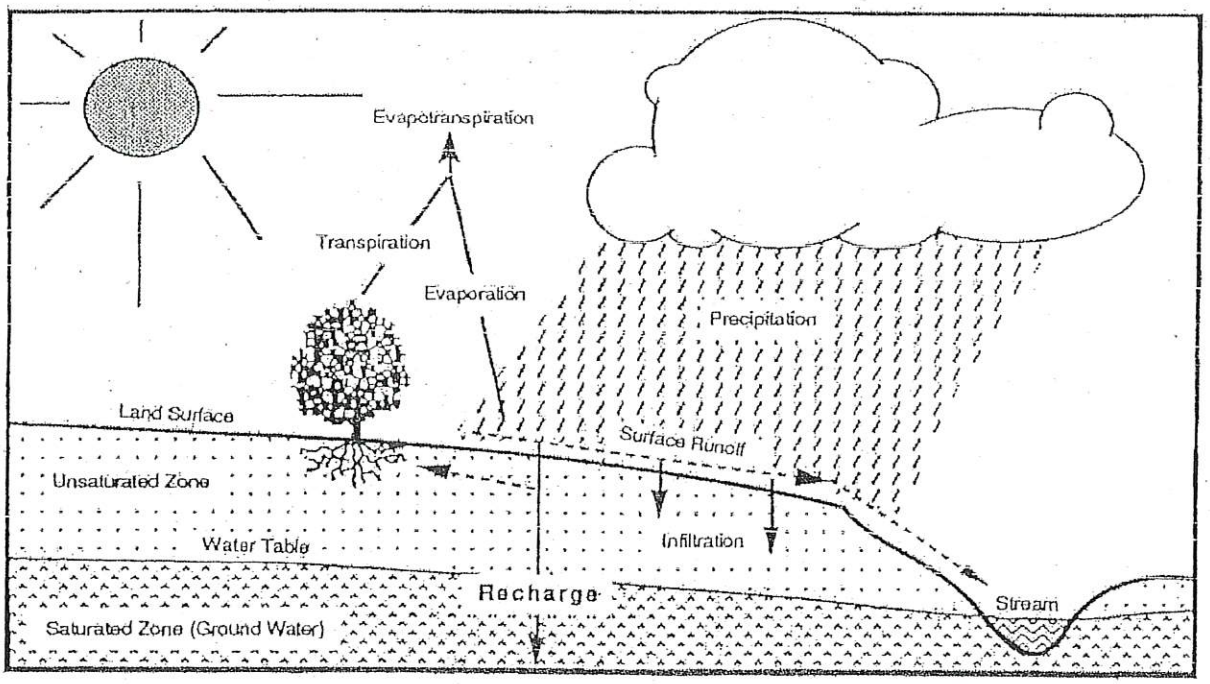
To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-tern 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 form 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

FIGURE C-1

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 form 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 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 downstream waterway, adversely affecting cold water fish species.

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 Borough of Island Heights encompasses a .6 square mile area in Ocean County, New Jersey. The Borough is an older, established community where land use is fairly stable; however in recent years it has been under some development pressure. Its population has increased from 1,470 in 1990 to 1,751 in 2000, and the 2005 County estimate is 1,861. Changes in the landscape may have increased stormwater runoff volumes and pollutant loads to the waterways of the municipality. Figure C-2 illustrates the waterways of the Borough. Figure C-3 depicts the Borough boundary on the USGS quadrangle map.

According to Appendix C of the Amendment to the Monmouth and Ocean County Water Quality Management Plan dated September 27, 2006, the Borough is listed for both the Toms River Estuary Waterbody and the Barnegat Bay Subgroup L Waterbody. The Borough boundary with Toms River Township is Dillon Creek which flows to the Toms River Waterbody. The Gilford Park Yacht Club is located in Toms River Township, north of the Borough. The Yacht Club is located on the Toms River Waterbody according to Appendix D (Marina Loading Estimates) of the above mentioned plan. Based on this information the Borough is of the opinion that the Toms River is the only waterbody bordering the municipality.

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 biometric related to benthic macroinvertebrate community dynamics. The Toms River is impaired for fecal coliform and total coliform, and the NJDEP has approved total maximum daily loads (TMDL's) for these pollutants dated September 29, 2003 and September 27, 2006 respectively. These bacteria levels are primarily caused by non-point source discharge from overland flow and stormwater run off, especially from parks and ball fields that attract geese and domestic pets, as all of the Borough's stormwater outfalls discharge into the river either directly or indirectly. There are currently no Borough owned stormwater management basins within the Borough.

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 identifying waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants.

The Toms River is currently listed on Sublist 5 of the Integrated List of Waterbodies for the following parameters: pathogens, arsenic, copper, lead, nickel and zinc. This means the river is impaired and the NJDEP is required to develop a TMDL for these pollutants.

The Borough's existing stormwater infrastructure was designed for different hydrologic conditions (i.e., less impervious area) than presently exists. Although many inlet basins and connecting pipes are undersized, the system as a whole sufficiently handles stormwater runoff during heavy rain events. Drainage improvements have been and will continue to be made during annual road improvement projects.

As required as part of the MSWMP, a map of the ground water recharge areas and wellhead protection areas are shown in Figure C-4 and C-5, respectively. The Borough has also implemented maintenance programs such as storm inlet retrofitting and outfall inspections to ensure the system operates efficiently,

Design and Performance Standards

The Borough of Island Heights has adopted Ordinance 2006-04, amending Chapter XXIX of the Revised General Ordinances entitled Land Use Procedures. Chapter XXIX is amended to include Section 29-3, Stormwater Control. The purpose of this Ordinance is to establish stormwater management requirements and controls for major development to minimize the adverse impact of stormwater runoff on water quality and water quantity in receiving water bodies, and maintain ground water recharge. The design and performance standards include language that is consistent with the rules in N.J.A.C. 7:8.5.

The Design and Performance Standards for stormwater management measure shall be met by incorporating non-structural stormwater management strategies into the design. If these strategies alone are not sufficient, structural stormwater management measures shall be incorporated into the design. Non-structural and structural stormwater management strategies are outlined in Section 5.E and Section 7 respectively of the Borough's Stormwater Control Ordinance.

Should a stormwater management basin be necessary, it shall be designed to meet the minimal safety standards outlined in Section 9 of the Borough Stormwater Control Ordinance. The language in this section is consistent with N.J.A.C. 7:8.6 "Safety Standards for Stormwater Management Basins".

The Borough inspectors will observe any construction required to ensure that the stormwater management measures are constructed and function as designed. Section 11 of the Borough Stormwater Ordinance includes language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8.5; "Maintenance Requirements". In order to ensure adequate long-term operation as well as preventative and corrective maintenance of both structural and non-structural storm water management facilities, a maintenance plan is required. In the event the Stormwater Management measures are not being met, the Borough shall so notify the responsible party in writing. The responsible party shall have fourteen (14) days to affect maintenance and repair of these measures in a manner that is approved by the Municipal Engineer. If the responsible party fails or refuses to perform said maintenance and repairs, the Municipality or County may initiate proceedings to do so and will bill the cost thereof to the responsible party.

Plan Consistency

The Borough is not within a Regional Stormwater Management Planning Area. If a RSWMP is developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

The NJDEP has approved, but not yet adopted, TMDL's for fecal coliform and total coliform for the Toms River dated September 29, 2003 and September 27, 2006 respectively. The Borough currently has ordinances that place restrictions on pet waste, wildlife feeding, and illicit storm sewer connections. These ordinances aid in the reduction of non-point and storm water source pollution. Should the NJDEP required additional management strategies once the TMDL's are adopted, the Borough will incorporate these strategies into this Municipal Stormwater Management Plan to be consistent.

The 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.

In addition to the Stormwater Management Plan, the Borough has adopted several ordinances that will help in the reduction of the TMDL's imposed on the Toms River. These ordinances are described in the Nonstructural Stormwater Management Strategies of this Plan.

The Borough's Ordinance requires all new development and redevelopment plans to comply with State and Federal Agency standards. The Coastal Area Facility Review Act (CAFRA) rules incorporate the new stormwater rules by reference. When submitting for a CAFRA Permit and requesting a waiver from the performance standards, the NJDEP may require a mitigation plan. During construction, Borough inspectors will enforce all NJDEP requirements.

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

The Borough shall also adopt the Stormwater Management Plan as an integral part of its Master Plan and official map upon the next re-examination.

Nonstructural Stormwater Management Strategies

The Borough has reviewed their ordinances and has provided a list of sections that currently incorporate non-structural stormwater management strategies.

Chapter XVI (Water and Sewer)

Section 16-6: Improper Disposal of Waste prohibits the spilling, dumping or disposal of materials other than stormwater to the municipal separate stormwater system (MS4) operated by the Borough.

Section 16-7: Illicit connection to Stormwater System: Prohibits any physical or non-physical connection that discharges domestic sewage, non-contact cooling water, process wastewater, or other industrial waste (other than stormwater) to the municipal separate storm sewer system operated by the Borough.

Chapter XX – Tree Removal, Soil Erosion and Sediment Control

Requires developers to comply with the New Jersey Soil Erosion and Sediment Control Standards and outlines Regulations and Standards including: whenever feasible, natural vegetation shall be retained and protected; drainage provisions shall accommodate increased runoff resulting from modified soil and surface conditions during and after the development or disturbance; water runoff shall be minimized and retained on the site whenever possible to facilitate groundwater recharge; and diversions, sediment basins, and similar required structures shall be installed prior to any onsite grading or disturbance.

Chapter XXIX – Land Use Procedures

Section 29-3.5: Stormwater Management Requirement for Major Development requires the developer to protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss; minimize

impervious surfaces; maximize the protection of natural drainage features and vegetation; minimize land disturbances including landscaping that encourages retention and planting of native vegetation.

Chapter XXXI – Land Sub-division

Section 31-9.6(i): Special Drainage Provisions. Subject to review and approval by the Borough Planning Board, the design of a development may be modified to take advantage of the natural drainage features of the land including, but not limited to, the utilization of the natural drainage system to the fullest extent possible; the maintenance of the natural drainage system as much as possible in its unimproved state; when drainage channels are required, wide shallow swales with natural vegetation will be preferred; the construction of flow retarding devices, detention areas and recharge basins to minimize runoff; maintenance of the base flow in streams, reservoirs and ponds.

These ordinances are enforced by the Island Heights Police Department as well as Borough Code and Zoning officials. Violation of these ordinances is subject to penalty as stated in Chapter 1, Section 1-5 of the Borough Code.

The following is a list of ordinance sections identified for revision to incorporate non-structural stormwater management strategies. Once the ordinance texts are completed, they will be submitted to the county review agency for review and approval within one (1) year after adoption of the Municipal Stormwater Management Plan.

Chapter XXX – Site Development

Section 30.1.2: Buffer Areas, Screening, Landscaping, and State Trees. Requires buffer areas along all side and rear property lines which abut areas zoned residentially and along front property lines on local, local collector, minor collector, and major collector streets which abut areas zoned for such residential uses. The landscape requirements for these buffer areas in the existing section do not recommend the use of native vegetation. The language of this section will be amended to require the use of native vegetation, which requires less fertilization and watering then non-native species.

Section 30.1.7g: Off Street Parking. Curbing – Requires the perimeter of all parking areas and internal islands within all parking areas open to the general public to have continuous cast-in-place concrete curbing with a six (6) inch face. This section will be amended to allow for flush curb with curb stop, or curbing with curb cuts to encourage developers to allow for drainage into neighboring landscaped areas.

Section 30.1.8: Sidewalks and Aprons. Requires sidewalks to be constructed on both sides of all streets within a development and entirely around the perimeter of all cul-de-sacs. Sidewalks are to be four (4) feet wide and constructed of concrete. Language will be added to this section to require developers to design sidewalks to discharge stormwater to neighboring lawns where feasible.

Long Term Operation and Maintenance of BMP's

Where the Borough assumes maintenance responsibility, preventative maintenance shall be performed on a regular basis and will be appropriate for the particular structural management measures being implemented. The maintenance measures shall be in accordance with N.J.A.C. 7:8-5 and include the following:

Storm Drain Inlet Retrofitting: The Borough is in the process of retrofitting all inlet basins with NJDOT bicycle safe grates and ECO-curb pieces. The ECO-curb pieces provide a clear space no larger than two (2) inches across the smallest dimension.

Street Sweeping and Road Erosion Control: All County roads are swept and all roads are monitored for erosion problems on a regular basis. All erosion problems will be repaired in accordance with the standards for soil erosion and sediment control in New Jersey.

Stormwater Facility Maintenance: All inlet basins and outfalls will be inspected on an annual basis for debris and proper function. All facilities in need will be cleaned and/or repaired.

The person or persons responsible for maintenance shall keep a detailed log of all preventive and corrective maintenance for the structural management measures, including a record of all inspections and work orders.

Land Use Build-out Analysis

A build-out analysis is not required, as the Borough itself is less than one square mile in size. FigureC-6 illustrates the Existing Land Use in the Borough. Figure C-7 is the Borough Zoning Map.

Mitigation Plans

The Borough has developed a mitigation plan for situations that arise in which the design and performance standards may be impossible to meet on the site of the proposed project and a variance or exemption has been granted. The existence of the mitigation plan does not supersede the requirements that an applicant meet the design and performance standards to the maximum extent possible.

Mitigation Project Criteria

The mitigation project must exist in the same drainage area and for the performance standard which the waiver is sought (unless there are no specific sensitive receptors that would be impacted as a result of the waiver/exemption). 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 applicant can select one of the following projects listed for the deficit from the performance standards resulting from the proposed project. More detailed information of the project can be obtained from the Borough Engineer. Listed below are specific projects that can be used to address the mitigation requirements:

Groundwater Recharge

- Replace existing undersized inlet basins with standard size recharge catch basins located in same drainage area as proposed project as directed by the Borough Engineer.

Water Quality

- Retrofit inlet basins as directed by the Engineer, with NJDOT Bicycle Safe grates and ECO-curb pieces.
- Install siltation chambers in existing inlet basins at Wanamaker Complex.
- Retrofit outfalls located in same drainage area as proposed project, to provide the removal of 80% of total suspended solids.

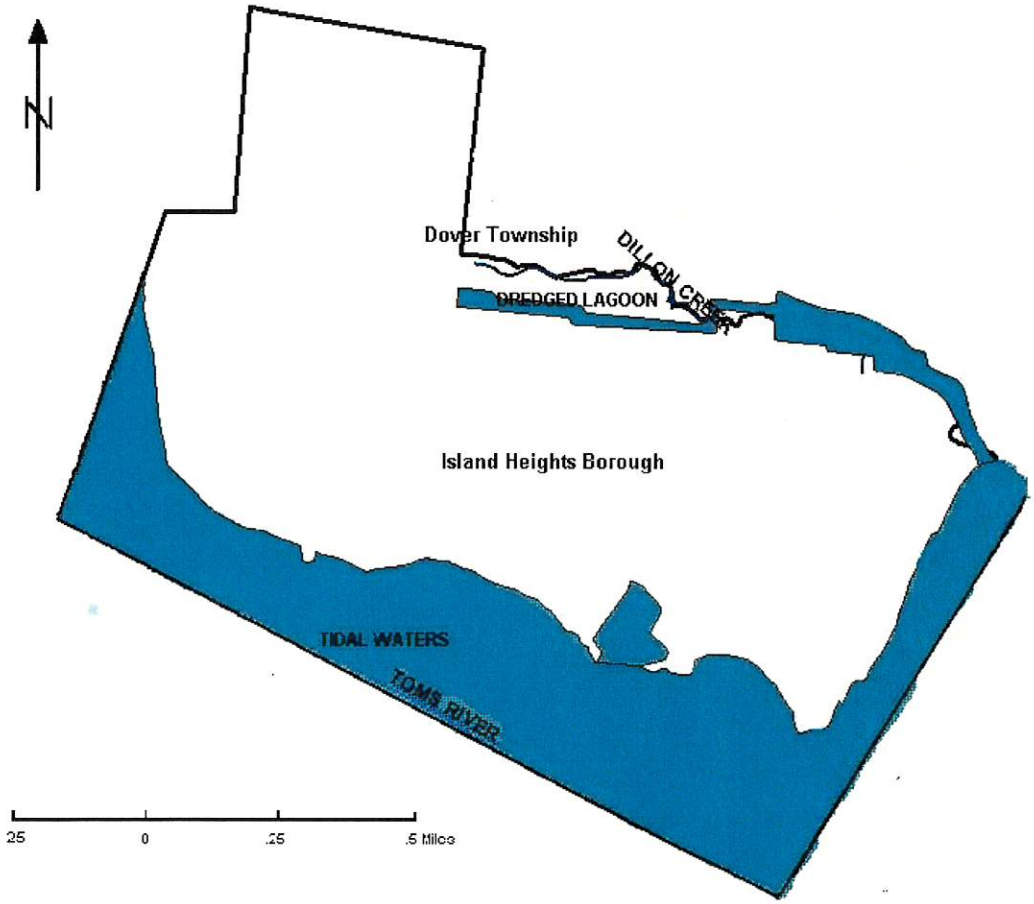
Water Quantity

- There exist along Dillon's Creek several locations where various obstructions have interrupted flow and causes flooding during heavy rain events. Remove any and all debris responsible for these obstructions.

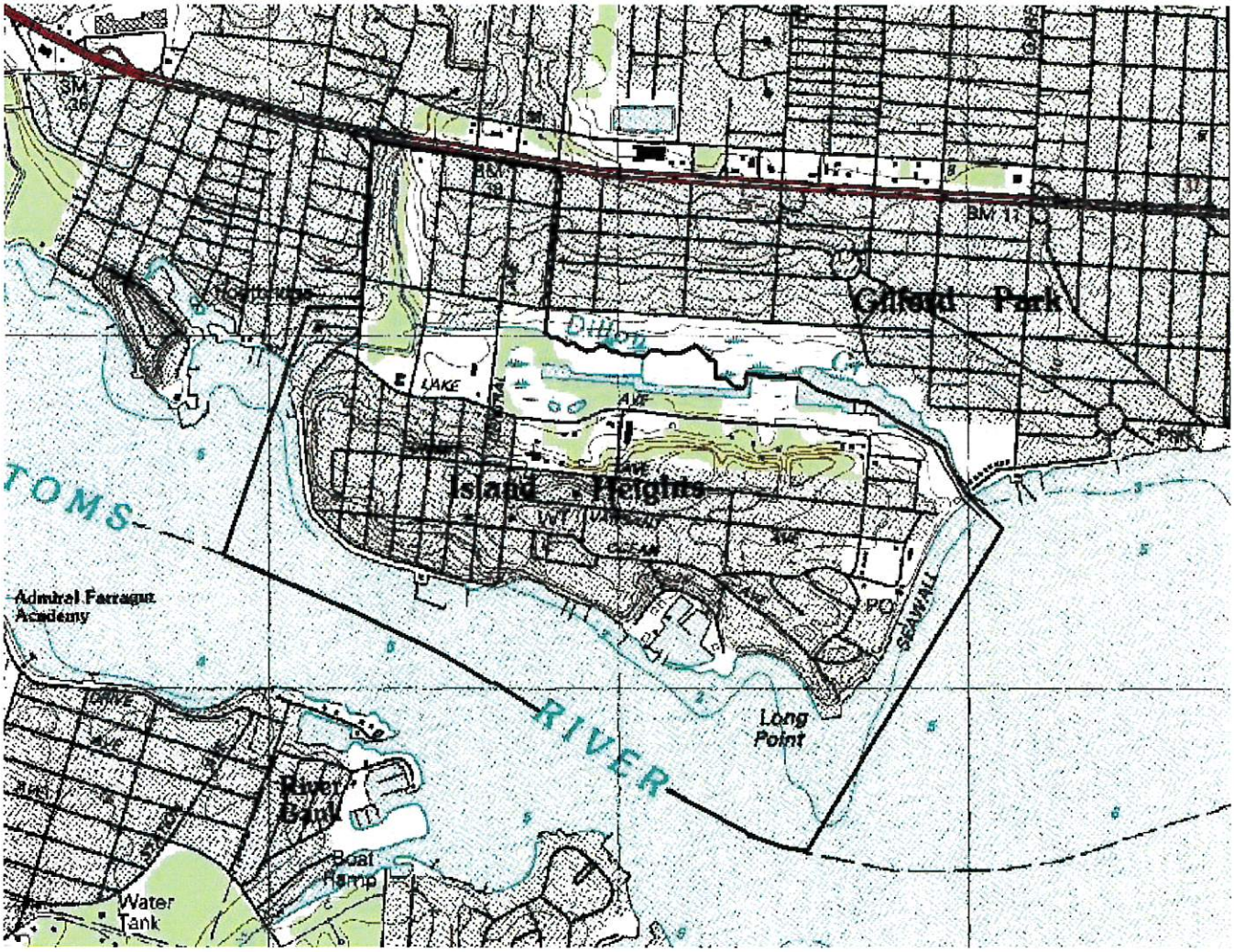
The Borough may allow a developer to fund analyses to identify potential mitigation projects that could be used to address deficits in complying with each of the performance standards. However, the funding option shall only be allowed where the project requesting the waiver will have no measurable impact with respect to flooding, erosion, water quality degradation, etc. The funding option may also be appropriate in situations where the size of an individual project requesting a waiver is small. In these situations it may not be practical to implement a commensurate mitigation project and may be preferable to accumulate funds to implement a larger mitigation project. In such cases, the receipt of the financial contribution shall satisfy the mitigation obligated for the project.

It should be noted that the issuance of a waiver by the NJDEP under a land use permit does not automatically waive the requirement for mitigation to be performed under the municipal review. In addition, all required permits must be obtained by the applicant for a mitigation project prior to municipal approval.

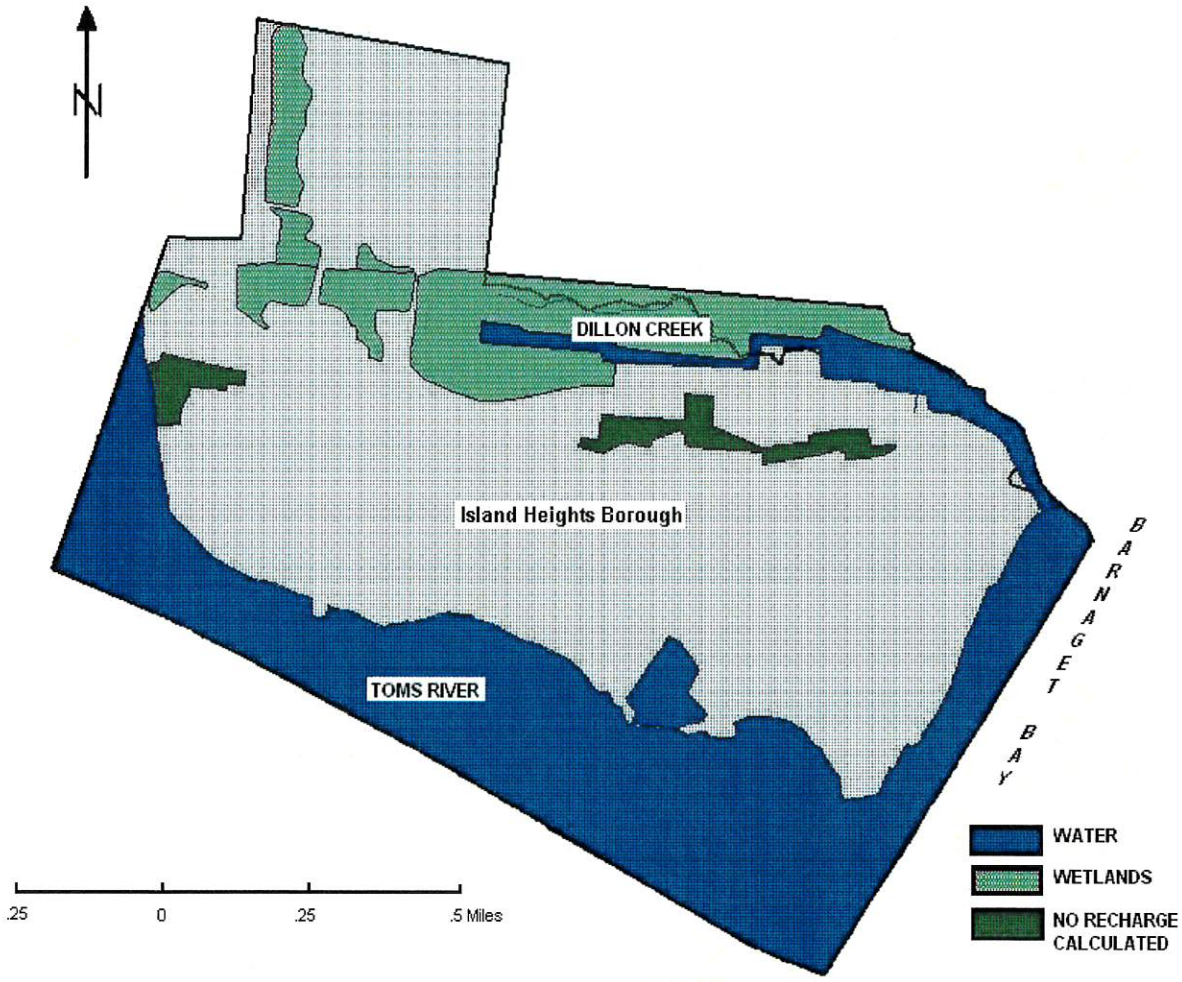
Borough and Its Waterways



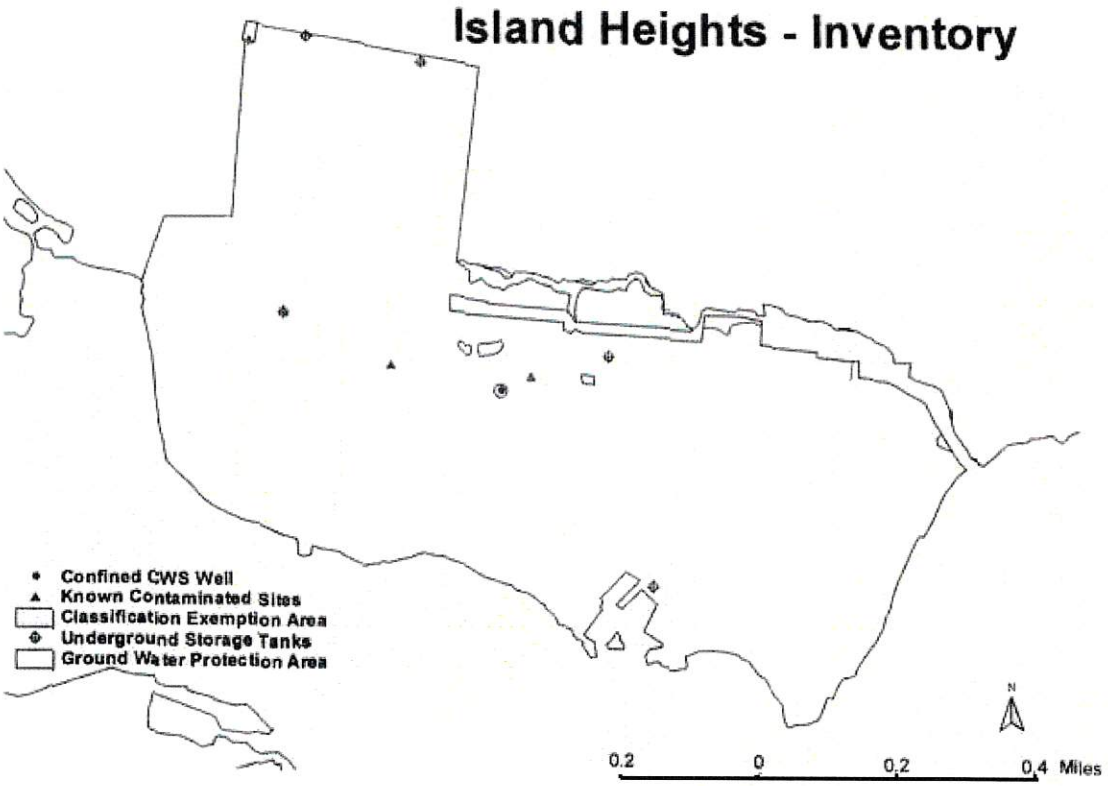
Borough Boundary on USGS Quadrangles



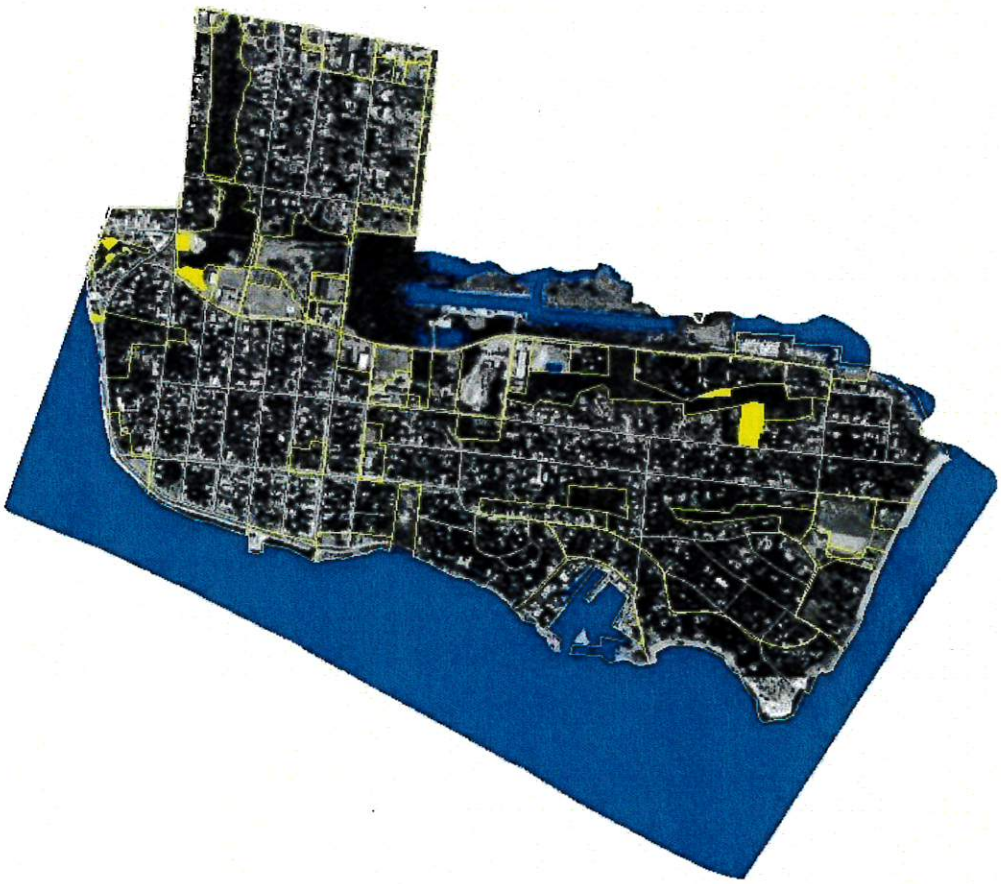
Groundwater Recharge Areas in the Borough



Wellhead Protection Area in the Borough



Borough's Existing Land Use



800 0 800 1600 Feet

Legend

- Municipal Boundary
- Roads
- Streams
- Lakes
- Developed Areas in 1986
- Developed Area Growth from 1986 to 1995/97

N W E S

The yellow outlined areas delineate areas that were developed as of 1986. The solid yellow areas have been developed between 1986 and 1995/97. The total area of impervious surface (buildings, sidewalks, driveways, parking lots, etc.) is about 116 acres. About 1 acre of this total was added since 1986. The total area of impervious surface constitutes 29% of the total (406) acres in the municipality.

Zoning Districts Within the Borough