

PLANNING BOARD  
CITY OF SOUTH AMBOY

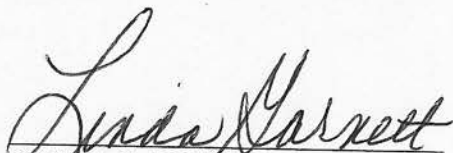
RESOLUTION # 18-2005

RESOLUTION RECOMMENDING ADOPTION OF THE STORMWATER  
MANAGEMENT PLAN OF THE CITY OF SOUTH AMBOY

BE IT RESOLVED by the Planning Board of the City of South Amboy in the County of Middlesex and State of New Jersey on this 24<sup>th</sup> day of August 2005 that having received and reviewed the Stormwater Management Plan of February 2005 prepared by James Cleary, P.E., Engineer for the City of South Amboy, and having found the same to be consistent with the Master Plan of the City of South Amboy and all relevant municipal land use regulations of the City of South Amboy, it is hereby recommended to the Governing Body of the City of South Amboy that it adopt the same at a duly convened meeting thereof.

BE IT FURTHER RESOLVED that the Planning Board Secretary forward a copy of this Resolution to the City Clerk within ten days of the date hereof.

ATTEST:

  
LINDA GARNETT, Secretary

PLANNING BOARD OF THE  
CITY OF SOUTH AMBOY

  
GEORGE FORRER, Chairman

**CERTIFICATION**

Certified to be a True Copy of a Resolution adopted on August 24, 2005 by the South Amboy Planning Board at a duly convened meeting thereof. This is a memorializing Resolution adopted pursuant to N.J.S.A. 40: 55D-10 (g) (2) to memorialize the approval granted on \_\_\_\_\_, 2005

DATE:

\_\_\_\_\_  
Linda Garnett, Secretary



# CITY OF SOUTH AMBOY

140 NORTH BROADWAY  
(732) 727-4600

SOUTH AMBOY, NJ 08879-1647  
FAX: (732) 727-6139

**JAMES E. CLEARY, PE**  
DIRECTOR, DEPARTMENT OF ENGINEERING

Reply to:  
207 South Stevens Avenue  
South Amboy, NJ 08879  
732—727-3610  
(Fax) 732—727-9212

August 10, 2005

South Amboy Planning Board  
140 North Broadway  
South Amboy, New Jersey 08879

Attention: George Forrer, Chairman

**Re: Municipal Stormwater Regulation Program  
City of South Amboy**

Dear Mr. Forrer:

In compliance with the New Jersey Department of Environmental Protection Stormwater Phase II Permitting Regulations and the Stormwater Management Rules, my office has prepared a Stormwater Management Plan, which must be approved and adopted. A copy of the plan is enclosed for your review.

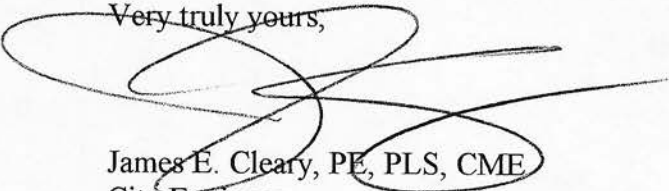
The plan has all of the required elements outlined in the Stormwater Management Rules that each municipality within the State must now implement.

The purpose of these regulations is to address the elimination of pollutants into surface water and groundwater. The major elements of this Plan is to better manage the impact of stormwater runoff from new and existing development, to educate the public as to ways they can assist in eliminating sources of pollution and to adopt in-house "Best Management Practices."

This Plan needs to be adopted at your next Planning Board Meeting so that I may forward the document to the Middlesex County Planning Board for their review and approval.

Please advise if you have any questions regarding this matter.

Very truly yours,

  
James E. Cleary, PE, PLS, CME  
City Engineer

JEC:ed  
Enclosure

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# MUNICIPAL STORMWATER MANAGEMENT PLAN

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**City of South Amboy**

**Middlesex County, New Jersey**

**John T. O'Leary, Mayor**

**CITY COUNCIL**

**James C. Reick, President**

**Joseph Connors  
Fred Henry**

**Russell Stillwagon  
John Szatkowski**

**Prepared by**

**James E. Cleary, PE, PLS, CME**

***Director of Engineering***

**February 2005**

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## **Introduction**

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the City of South Amboy (“the City”) 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 one or more acre of land. 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.

The plan addresses the review and update of existing ordinances, the City 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 standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

A “build-out” analysis normally required in developing communities, has not been included in this plan. Since the combined total of vacant land and agricultural land is less than one square mile. South Amboy is not required to prepare a Land Use/Build Out Analysis. If such an analysis was required it would be based upon existing zoning and land available for development. The plan would also address the review and update of existing ordinances, the City 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 standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lesson 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 non-point 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; and
- 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 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**

South Amboy was incorporated as a Township in 1798 and, at that time, contained a much larger area than it does today. From 1888 to 1908, South Amboy was a Borough and became a City on April 11, 1908. Today, the City encompasses one (1) square mile area in Middlesex County, New Jersey.

South Amboy is situated at the east end of the Raritan Bay and in a position that was once the threshold of early American civilization. In the early days of America, the City was first a stagecoach, then a boat and then a railroad terminus.

The industrialization that took place at the turn of the century saw further development of the railroad facilities such that South Amboy became a leading coal terminus and maintenance yard for the Pennsylvania Railroad. In addition, commuter rail transportation flourished as the New York Metropolitan Area developed.

In the late 1950's, early 1960's, the City experienced some residential expansion with the Roger's Estates project in the Mechanicsville area and the Amshore Homes development along Stevens Avenue. Until recently, housing growth was limited to sporadic individual homes and conversions to two-family dwellings. The population peaked at that time to about 10,000 residents.

In recent years, the City has undergone a significant transformation with the development of its waterfront area and revitalization of its commercial downtown area. As a result, the population has begun to make a turn around from its previous, steady decline from 10,000. The population in 1980 was 8436, in 1990 was 7863 and in 2000 was 7913. As the development continues, and the population expands, changes in the landscape will likely increase stormwater runoff volumes and pollutant loads to the waterways of the municipality. Figure 2 illustrates the waterways in the City. Figure 3 depicts the City boundary on the USGS quadrangle maps.

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

The major river that borders the City to the north and east, the Raritan River, is moderately impaired. In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. This data shows that the instream total phosphorus concentrations and fecal coliform concentrations of the Raritan River frequently exceeds the state's criteria. This means that the river is impaired waterways and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants in the waterway.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, and reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

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, the City has exhibited water quality problems including flooding and diminished base flows in its natural, outlet ditches and channels. Many of the culverts associated with road crossings in the City, as well as sections of its stormwater collection system are undersized. During several storm events, these undersized culverts do not have adequate capacity, thereby causing a backwater effect and flooding upstream.



These culverts were designed for much different hydrologic conditions (i.e., less impervious area) than presently exist in the City. As the imperviousness increased in the City, 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 crossings, and degraded stream habitats. The high imperviousness of the City 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 the groundwater recharge areas are shown in Figure 4.

There are no wellhead protection areas throughout the City. (See Figure 5: Wellhead Protective Areas.)

A soil map of the City is provided, Figure 6.

Typically, the new Statewide Stormwater Management regulations (N.J.A.C. 7:8-5.4) require that new development plans should consider a groundwater re-charge component to mitigate losses in recharge due to development. The New Jersey State Plan Policy Map has delineated the City of South Amboy to be within Metropolitan Planning Area (PA1). The N.J.D.E.P. has included Metropolitan Planning Areas in their definition of "Urban Redevelopment Areas". By that definition, the groundwater recharge requirement does not apply.

### **Design and Performance Standards**

The City will adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies.

Generally, projects meeting the definition of a major development are required to meet the regulations stated under N.J.A.C. 7:8-5. Said regulations address erosion control, groundwater recharge, runoff quantity standards, stormwater runoff quality standards, standards for calculating stormwater runoff and groundwater recharge, structural stormwater management standards, and maintenance requirements, as stated above. The major development must meet the established design and performance standards set forth in the Soil Erosion and Sediment Control Act.

Major developments must also meet one of two standards for groundwater recharge (N.J.A.C. 7:8-5.4(a) 2.): (1) maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site or (2) infiltrate the increase in the stormwater runoff volume from pre-construction to post – construction for the two-year storm.

For water quality (N.J.A.C. 7:8-5.5) stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in the stormwater runoff generated by the water quality design storm by 80 percent of the anticipated load from the major development.

To control stormwater runoff quantity impacts (N.J.A.C. 7:8-5.4 3.), a major development must meet one of three design standards: (1) demonstrate at no point in time that the post-construction runoff hydrograph exceeds the pre-construction runoff hydrograph, (2) demonstrate there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the 2, 10 and 100 year storm event and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site, or (3) demonstrate the post-construction peak runoff rates for the 2, 10 and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction runoff rates. However, for stormwater water runoff quantity requirement (3), stream encroachment standards (N.J.A.C. 7:13-2.8) will require for the 100-year storm event 75 percent of the pre-construction peak runoff rates.

The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins.

The Stormwater Control Ordinance must be submitted to the County for review and approval within 24 months of the effective date of the Stormwater Management Rules, April 2006.

The following ordinances must be adopted by the City and meet the minimum requirements set forth in the Tier A Municipal Stormwater General permit (NJ0141852). If the following ordinances already exists then they must be reviewed and updated where necessary. Those ordinances are as follows, but are not limited to:

1. *Pet Waste Ordinance*- will require owners and keepers to immediately and properly dispose of their pet's solid waste and will require information provided by NJDEP to be distributed with pet licenses regarding said ordinance.
2. *Litter Ordinance* – will meet the minimum standards set forth in the State Litter Statue (N.J.S.A. 13:1E-99.3);
3. *Improper Disposal of Waste Ordinance*- will prohibit spilling, dumping or disposing of any materials other than stormwater into the municipal separate storm sewer system;
4. *Wildlife Feeding Ordinance* – will prohibit feeding of non-confined wildlife in any public park or property owned-operated by the Municipality;
5. *Illicit Connection Ordinance* –will prohibit illicit connections to the municipal separate storm sewer system.

During construction, City inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed. Operation and Maintenance Manuals will be required for structural BMPs to ensure long-term maintenance strategies.

### **Plan Consistency**

At this time, the City is not within a Regional Stormwater Management Planning Area and no TMDLs have been developed for waters within the City; therefore this plan does not need to be consistent with any regional stormwater management plans (RSWMPs) nor any TMDLs at this time. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated 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.

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

## Non-Structural Stormwater Management Strategies

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

Chapter 53 of the City Code, entitled Development Regulations, was reviewed with regard to incorporating nonstructural stormwater management strategies. Several changes are to be made to Article XVII of this Chapter, entitled "Design and Performance Standards" to incorporate these strategies.

**Section 53-79(5): Buffers** requires buffer areas along all lot and street lines separating residential uses from arterial and collector streets, separating a nonresidential use from either a residential use or residential zoning district line, and along all street lines where loading and storage areas can be seen from the street. 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 than non-native species. Additionally, language will be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces. This section currently requires the preservation of natural wood tracts and limits land disturbance for new construction.

**Section 53-79(8) Curbs** require that concrete curb be installed along every street within and fronting on a development. This section will be amended to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas.

**Section 53-79(9): Drainage**, requires that all streets be provided with inlets and pipes where the same are necessary for proper drainage. This section was amended to encourage the used of natural vegetated swales in lieu of inlets and pipes.

**Section 53-79 (20): Natural Features** requires that natural features, such as trees, brooks, swamps, hilltops, and views, be preserved whenever possible, and that care be taken to preserve selected trees to enhance soil stability and landscaped treatment of the area. This section will be amended to expand trees to forested areas, to ensure that leaf litter and other beneficial aspects of the forest are maintained in addition to the trees.

**Section 53-79(21): Nonconforming Uses, Structures or Lots** requires a variance for existing single-family homes proposing additions that exceed the maximum percent impervious. The homeowner must mitigate the impact of the additional impervious surfaces unless the stormwater management plan for the development provided for these increases in impervious surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge as described in Chapter 144 of the proposed ordinance.

**Section 53-79(23): Off-site and Off-tract Improvements** describes essential off-site and off-tract improvements. Language will be added to this section to require that any off-site and off-tract stormwater management and drainage improvements must conform to the "Design and Performance Standards" described in this plan and provided in proposed Chapter 144 of the City Code.

**Section 53-79 (24): Off-street Parking and Loading** details off-street parking and loading requirements. All parking lots with more than 10 spaces and all loading areas are required to have concrete or Belgian block curbing around the perimeter of the parking and loading areas. This section also requires that concrete or Belgian block curbing be installed around all landscaped areas within the parking lot or loading areas. This section will be amended to allow for flush curb with curb stop, or curbing with curb cuts to encourage developers to allow for the discharge of impervious areas into landscaped areas for stormwater management. Also, language will be added to allow for use of natural vegetated swales for the water quality design storm, with overflow for larger storm events into storm sewers. This section also provides guidance on minimum parking space requirements. These requirements are based on the number of dwelling units and/or gross floor area. The section allows a developer to demonstrate that fewer spaces would be required, provided area is set aside for additional spaces if necessary. This section will be amended to allow pervious paving to be used in areas to provide overflow parking, vertical parking structures, smaller parking stalls, and shared parking.

**Sections 53-79 (25): Performance Standards** provide pollution source control. It prohibits materials or wastes to be deposited upon a lot in such form or manner that they can be transferred off the lot, directly or indirectly, by natural forces such as precipitation, evaporation or wind. It also requires that all materials and wastes that might create a pollutant or a hazard be enclosed in appropriate containers.

**Section 53-79 (32): Shade Trees** requires a minimum of one shade tree for every fourth (40) feet to sixty (60) feet of road frontage or parting lot perimeter. Revisions to this ordinance will establish a "critical footprint area" that extends 20 feet beyond the driveway and building footprint where clearing of trees cannot occur. This complies with minimizing land disturbance, which is a nonstructural stormwater management strategy.

**Section 53-79 (33): Sidewalks** describe sidewalk requirements for the City. Although sidewalks are not required along all streets, the City can require them in areas where the probable volume of pedestrian traffic, the development's location in relation to other populated areas and high vehicular traffic, pedestrian access to bus stops, schools, parks, and other public places, and the general type of improvement intended indicate the advisability of providing a pedestrianway. Sidewalks are to be a minimum of four 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 to disconnect these impervious surfaces, or use permeable paving materials where appropriate.

**Section 53-79 (36): Soil Erosion and Sediment Control** addresses soil erosion and sediment control by referencing the State of New Jersey Soil Erosion and Sediment Control Ordinance. This ordinance requires developers to comply with the New Jersey Soil Erosion and Sediment Control Standards and outlines some general design principles, including: whenever possible, retain and protect natural vegetation; minimize and retain water runoff to facilitate groundwater recharge; and, install diversions, sediment basins, and similar required structures prior to any on-site grading or disturbance.

**Section 53-79(38): Stormwater Runoff** will address stormwater runoff by referencing proposed Chapter 144, the City's Surface Water Control Ordinance, which will include all requirements outlined in N.J.A.C. 7:8-5. These changes were presented earlier in this document.

**Section 53-79 (40): Streets** describes the requirements for streets in the City. The City has several street classifications, ranging from "Arterial," which has a minimum right-of-way of 86 feet, to "Secondary Local," which has a minimum right-of-way of 50 feet. Street paving widths are a function of the number of units served, whether a street is curbed, whether on-street parking is permitted, whether the interior streets serve lots of two acres or larger, and whether on-site topographical constraints allow design flexibility. Depending on these factors, paving width for secondary local streets has a range from

20 to 32 feet. This section will be amended to encourage developers to limit on-street parking to allow for narrower paved widths. This section also requires that cul-de-sacs have a minimum radius of 50 feet. Language will be added to this section to reduce the minimum radius of cul-de-sac designs. Cul-de-sacs will be consistent with the current residential site improvement standard.

Several changes will be made to Article XVIII zoning policy. The City has two (2) types of residential districts ; a single-family district with a maximum percent building coverage allocation of 25% and several medium density districts with allocations ranging from 20% to 40%.

The City also has four (4) types of non-residential districts. Each of these districts has a maximum percent building coverage allocation, ranging from 25% to 50%.

Lastly, the City has designated eight (8) sections of the community as Redevelopment Areas. There are dynamic areas that vary as parcels are added or deleted and development proposals are entertained. As a result, the required lot signs, building coverage and impervious areas do fluctuate. Although each zone has a maximum allowable percent impervious surface, the City Code was amended to remind developers that satisfying the percent impervious requirements does not relieve them of responsibility for complying with the Design and Performance Standards for Stormwater Management Measures contained in Chapter 144-Surface Water Runoff. The City is evaluating the maximum allowable impervious cover for each zone to determine whether a reduction in impervious cover is appropriate. The City is also evaluating a maximum allowable impervious cover for each zone to determine whether a deduction in impervious cover is appropriate. Also, if a developer is given a variance to exceed the maximum allowable percent imperviousness, the developer must mitigate the impact of the additional impervious surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge as described in Chapter 144. A detailed description of how to develop a mitigation plan is included in this Municipal Stormwater Management Plan.

### **Land Use/Build-Out Analysis**

As seen in the current land use map (Figure 8) City of South Amboy has been built out in a typical urban fashion. The table included in the background section shows the amount of land devoted to each type of land use.

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 a build-out analysis.

In the case of City of South Amboy, the total land area of the municipality equals one (1) square mile leaving its available vacant land well below the threshold.

### **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. However, approval of variances or exemptions from N.J.A.C. 7:8 are a last resort and all non-structural and structural BMPs should be explored prior to a variance or exemption being granted. Non-structural BMPs are highly recommend and shall be the initial design technique utilized. It is up to the discretion of the City Engineer, Board and professionals to ensure all BMP options are explored prior to granting a variance or exemption. The list of potential mitigation plans may be eliminated, updated or revised by the City. The City Engineer shall be consulted to determine availability of mitigation projects. All mitigation projects are subject to approval of the City Engineer.

## Mitigation Project Criteria

The mitigation project must be implemented within the same drainage area as the proposed development. If a suitable site cannot be located in the same drainage area as the proposed development, the mitigation project may provide mitigation that is equivalent to the impacts for which the variance or exemption is sought and addresses the same issue in adjacent drainage areas. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property, which does not currently meet the design and performance standards as outlined in the MSWMP. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapter 8 and 9 of the NJ Stormwater BMP Manual.

The City Engineer must be contacted to obtain a list of potential mitigation projects to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the mitigation projects shall be obtained from the City Engineer. The City maintains the right to update the mitigation project list and is not held accountable for time frames or to construct any of the mitigation projects or potential mitigation projects addressing groundwater recharge, water quality and water quantity.

Mitigation projects are environmental enhancement projects that provide groundwater recharge, control flooding or control non-point source pollution. The City Engineer shall be contacted for availability, description and any other necessary information pertaining to mitigation projects.

Mitigation projects are subject to the approval of the City Engineer. Each project is approved upon an individual basis, considering the extent of the variance, waiver or exception granted. Mitigation projects may require cooperation with outside agencies such as the Soil Conservation District, Mosquito Commission, Army Corp of Engineers, NJDEP, etc.

The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a MSWMP, or towards the development of a RSWMP. Funding quantities are subject to the approval of the City Engineer and Governing Body and will include costs or practical costs, including those associated with purchasing a property or easement for mitigation, and those associated with the long-term maintenance requirements of the mitigation measure.

**Appendix A**

**Figures**

**Figure No. 1:** Groundwater Recharge in Hydrologic Cycle.....A-1

**Figure No. 2:** City & It's Waterways.....A-2

**Figure No. 3:** City Boundaries on USGS Quadrangle.....A-3

**Figure No. 4:** Groundwater Recharge Areas in The City.....A-4

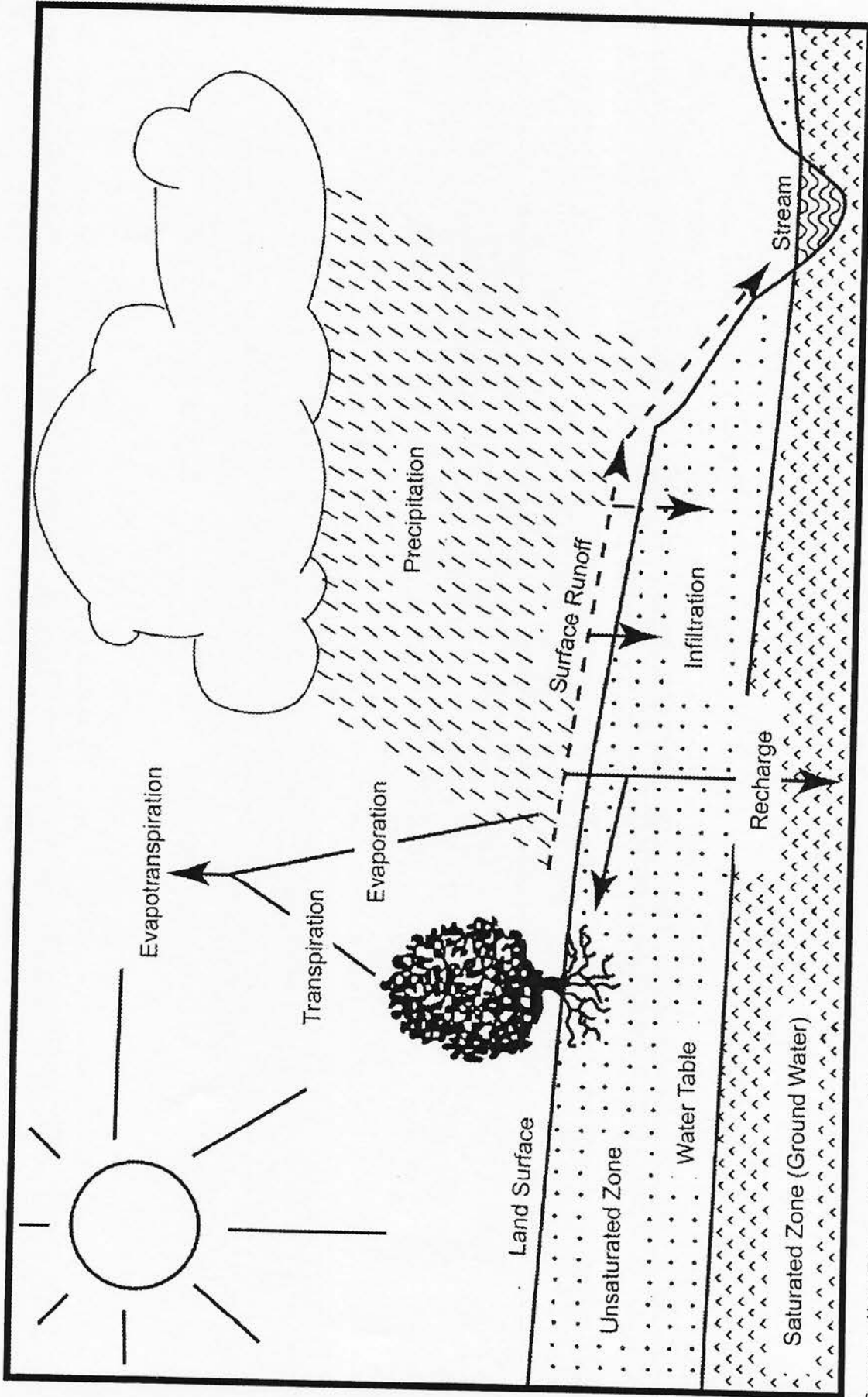
**Figure No. 5:** Wellhead Protection Areas.....A-5

**Figure No. 6:** Soil Areas.....A-6

**Figure No. 7:** Aerial Photograph.....A-7

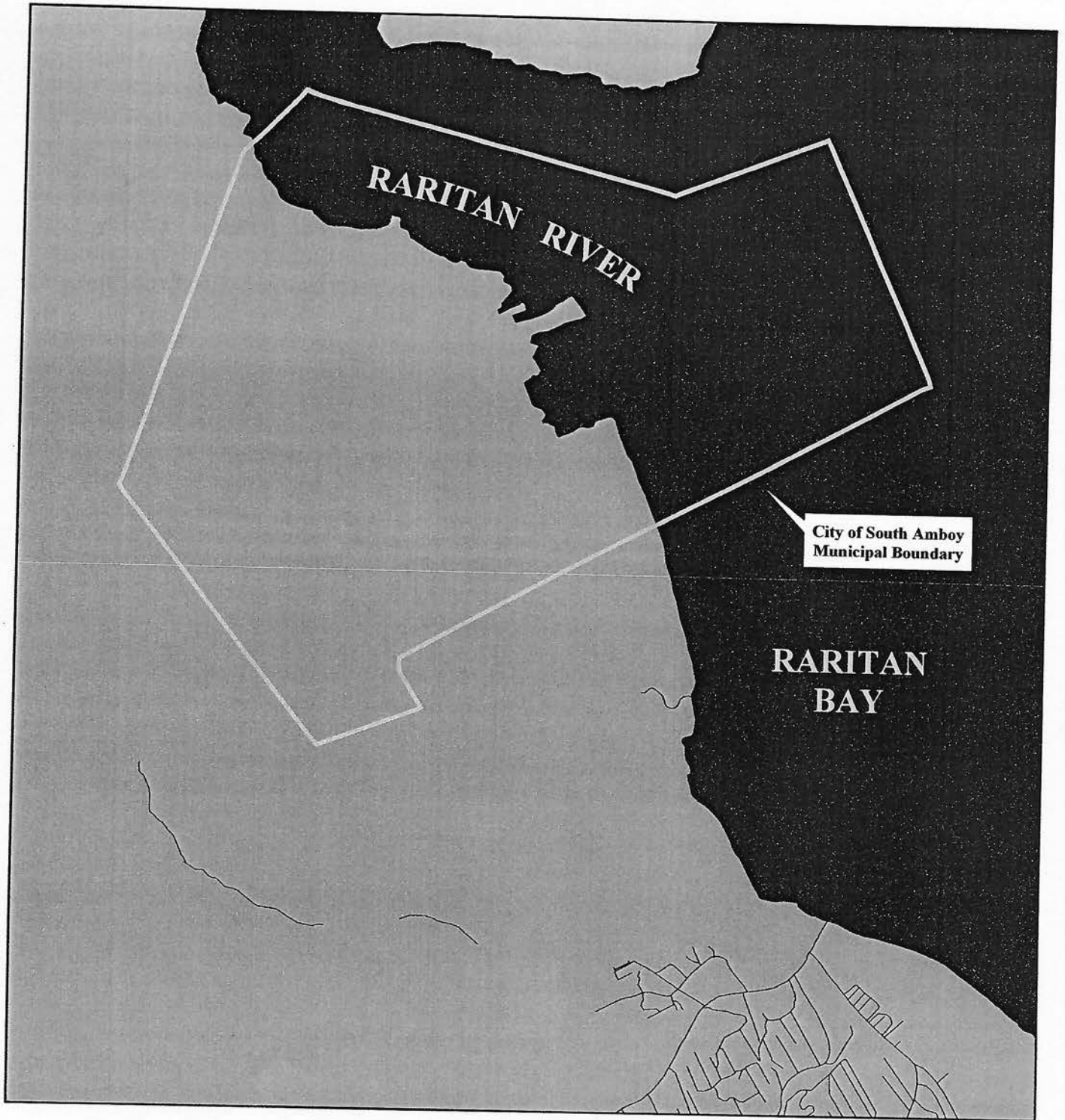
**Figure No. 8:** Land Use Map.....A-8

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



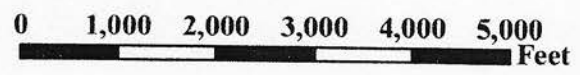
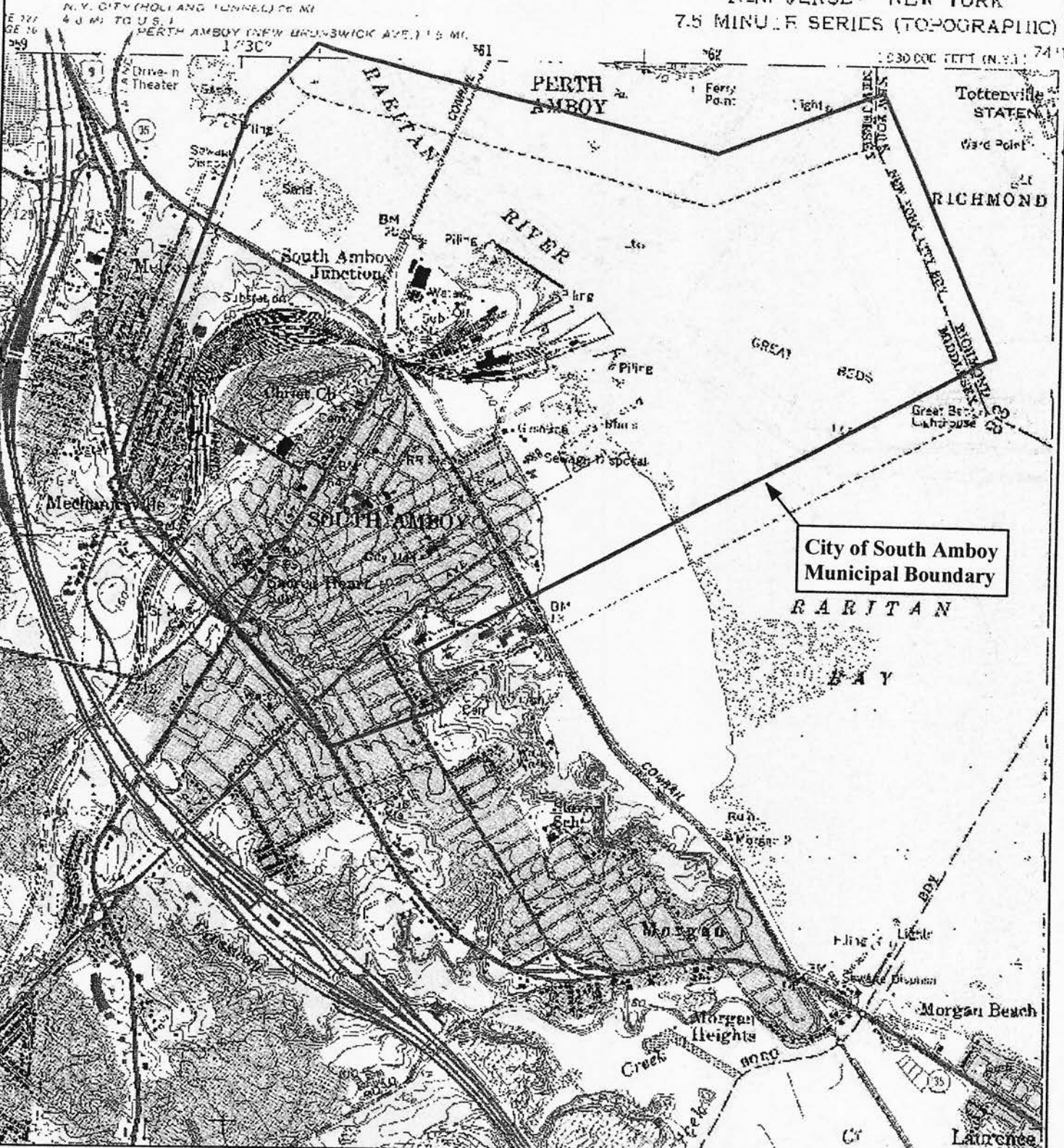
Source: New Jersey Geological Survey Report GSR-32.



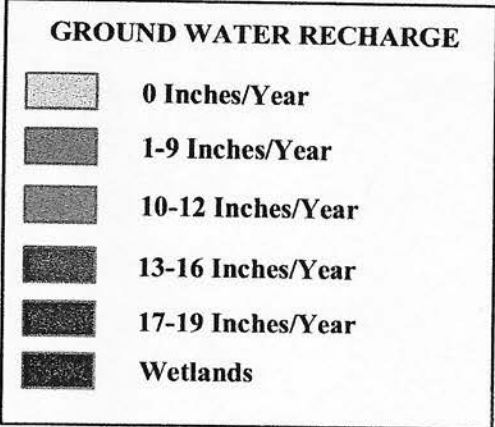
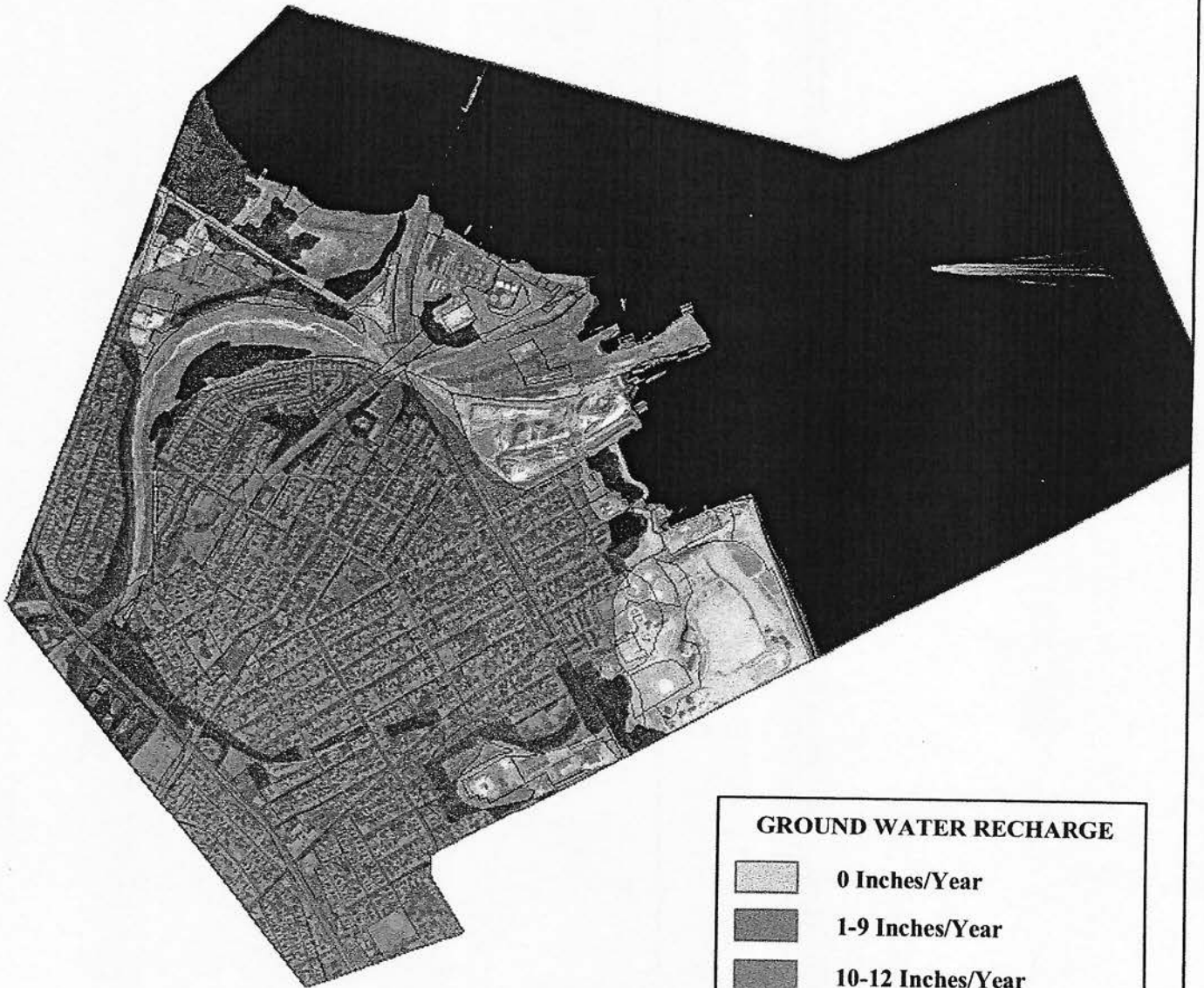


**Figure No. 2**  
**CITY AND IT'S WATERWAYS**  
**CITY OF SOUTH AMBOY**  
**MIDDLESEX COUNTY, NEW JERSEY**

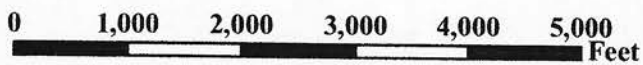
SOUTH AMBOY QUADRANGLE  
 NEW JERSEY NEW YORK  
 7.5 MINUTE SERIES (TOPOGRAPHIC)



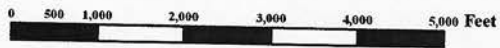
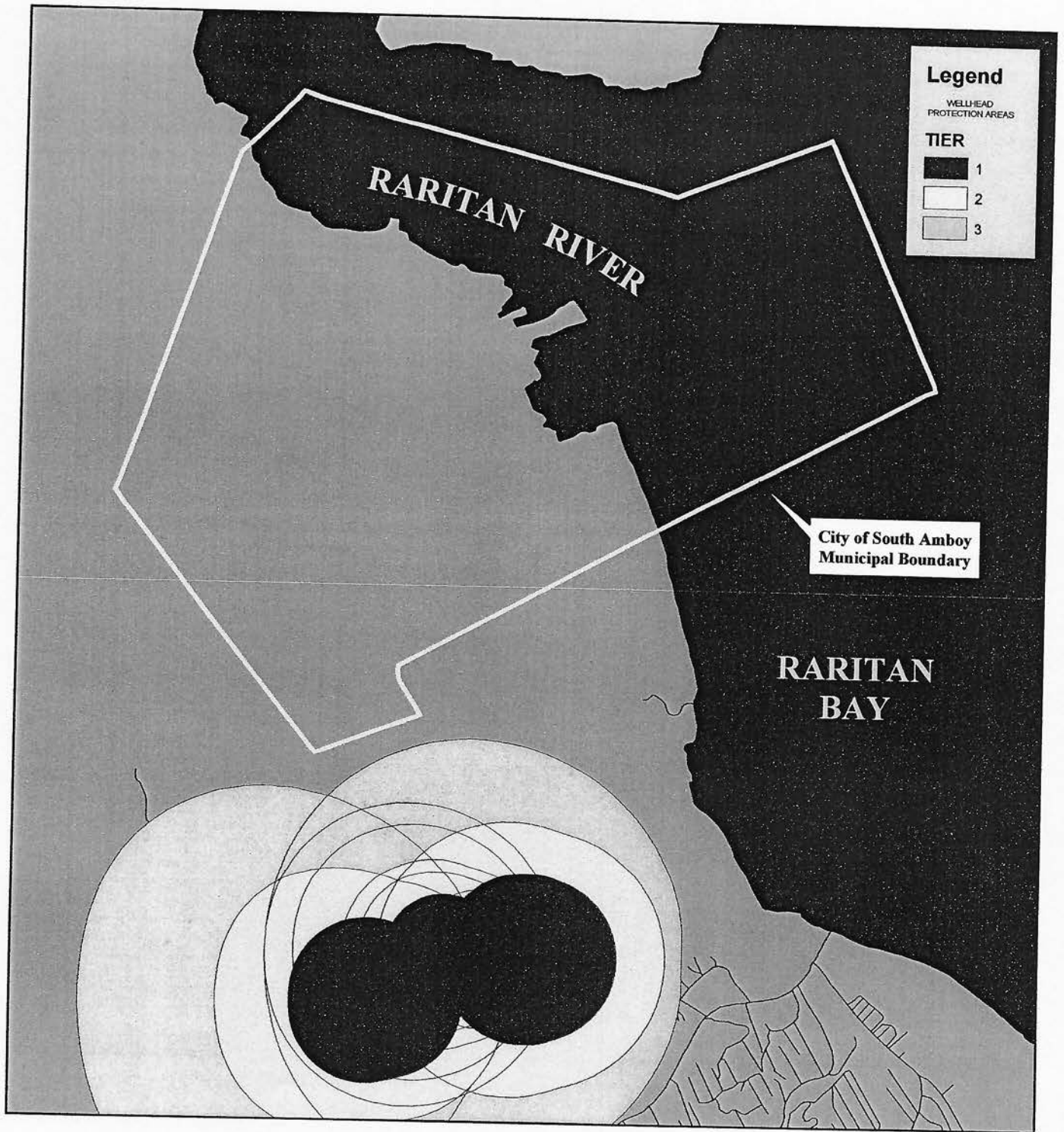
**Figure No. 3**  
 AERIAL PHOTOGRAPH  
 CITY OF SOUTH AMBOY  
 MIDDLESEX COUNTY, NEW JERSEY



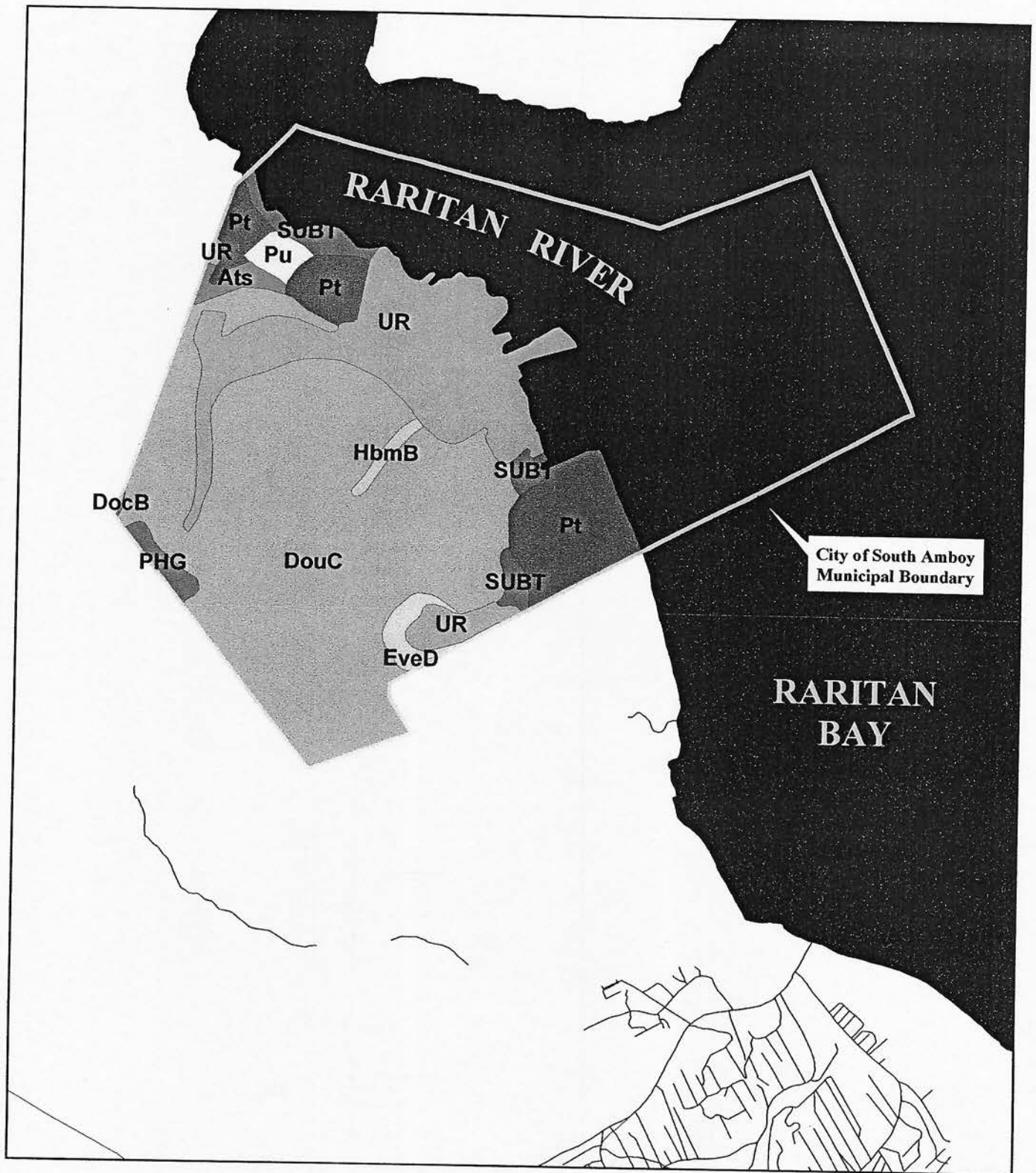
**Figure No. 4**



**GROUND WATER RECHARGE AREAS  
SOUTH AMBOY, NEW JERSEY**  
 Calculated using the New Jersey Ground Water  
 Recharge Spreadsheet, Version 2.0  
 February 2004.  
 NJ Dept of Environmental Protection



**Figure No. 5**  
WELLHEAD PROTECTION AREAS  
CITY OF SOUTH AMBOJ  
MIDDLESEX COUNTY, NEW JERSEY



**Figure No. 6**  
**SOIL AREAS**  
**CITY OF SOUTH AMBOY**  
**MIDDLESEX COUNTY, NEW JERSEY**

**MEMORANDUM**

TO: KATHLEEN VIGILANTE, CITY CLERK  
FROM: LINDA GARNETT, PLANNING BOARD SECRETARY  
DATE: AUGUST 25, 2005  
RE: RESOLUTION #18-2005

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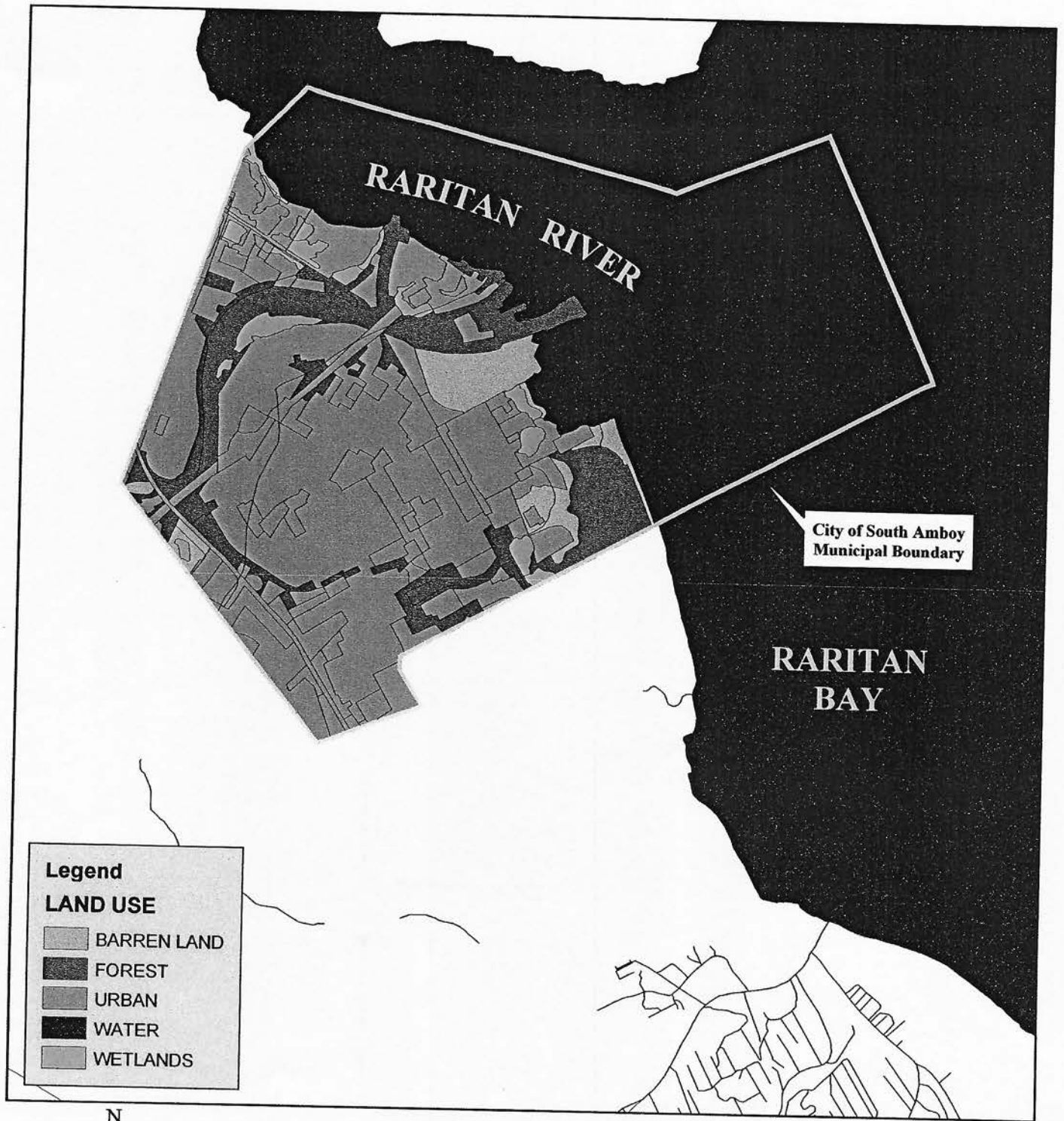
Attached please find Resolution #18-2005 adopt at the Board's August 24, 2005 meeting.

Thank you.



0 1,000 2,000 3,000 4,000 5,000 Feet

**Figure No. 7**  
AERIAL PHOTOGRAPH  
CITY OF SOUTH AMBOY  
MIDDLESEX COUNTY, NEW JERSEY



**Figure No. 8**  
**LAND USE**  
**CITY OF SOUTH AMBOY**  
**MIDDLESEX COUNTY, NEW JERSEY**