

MUNICIPAL STORMWATER MANAGEMENT PLAN

for

TOWNSHIP OF SHAMONG BURLINGTON COUNTY, NEW JERSEY

August 2007

Prepared by:



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N.J. License No. 15877**

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Township of SHAMONG 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 baseflow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities. A “build-out” analysis has been included in this plan based upon existing zoning and land available for development. 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 standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

Goals

The goals of this MSWMP are to:

- 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; and
- protect public safety through the proper design and operation of stormwater basins.

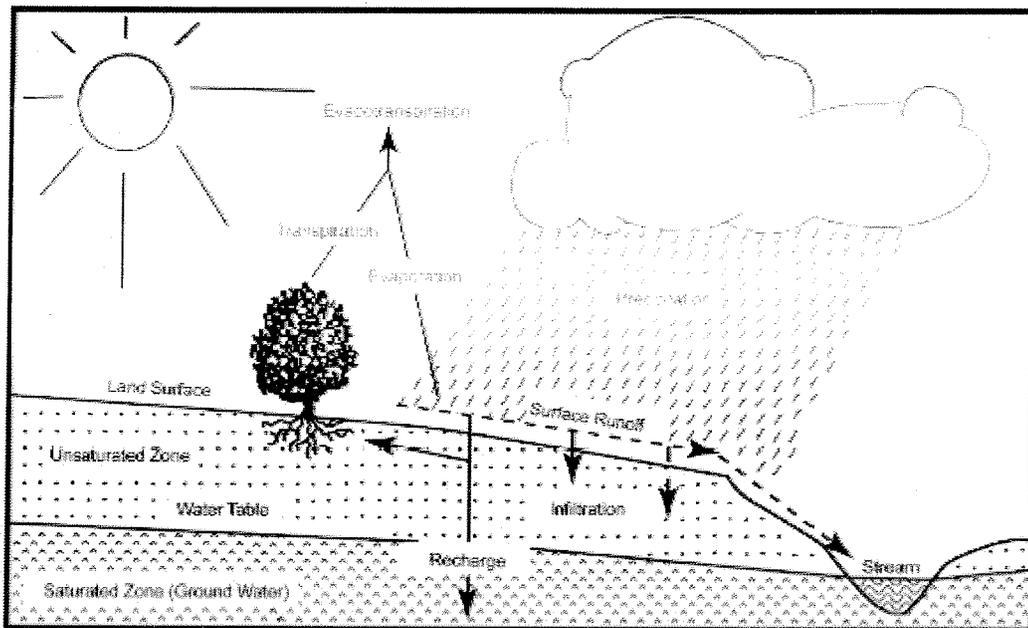
To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan 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 C-1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients. In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Background

Shamong Township is located in Burlington County, NJ. The Township has a total area of 45.1 square miles of which 99.45% of it is land and 0.55% of it is water. The Township's location in the county and its location on the USGS Quadrangle are illustrated in Figure 1 and Figure 2 respectively. The location on the USGS Quadrangle map is illustrated in Figure 3.

Shamong Township experienced a rapid increase in population from 1970 to 1980. During that period the population grew from 1318 to 4,537. The population of the Township has continued to grow over the past two decades but at a slower rate. Between 1980 and 1989 the Township had a 21.1% increase in population, and between 1990 and 2003, the population grew by 16.4%. The population as of 2003 was 6,749 people. The population estimates for the Township are detailed in Table 1. The population density at the last census (2000) was 144.2 people per square mile, and the density of housing units was 48.5 per square mile.

Table 1. Population Estimates for Shamong Township from 1970 to 2003.

1970	1,318	1980	4,537	1990	5,796
1971	1,451	1981	4,674	1991	5,853
1972	1,639	1982	4,871	1992	5,885
1973	1,698	1983	4,857	1993	5,923
1974	1,805	1984	4,865	1994	5,922
1975	2,133	1985	4,892	1995	6,070
1976	2,313	1986	5,049	1996	6,216
1977	2,603	1987	5,086	1997	6,283
1978	3,189	1988	5,230	1998	6,318
1979	3,525	1989	5,494	1999	6,359
				2000	6,462
				2003	6,749

The waterways in the Township include Indian Mills Brook, Mullica River, Bard Branch, Deep Run, Skit Branch, and Batsto River (Figure C-2). The Mullica River, Batsto River and Indian Mills Brook are impaired waterways in the Township.

New Jersey is required by the Federal Clean Water Act to prepare biennial reports on the water quality in the state. This report, The Integrated Water Quality Monitoring and Assessment Report, includes a list (Sublist 5) of all impaired waterways that require TMDL's.

A TMDL is the amount of a pollutant that can be accepted by a water body without exceeding water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. NJDEP develops implementation plans to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

As mentioned previously, Indian Mills Brook Batsto River, and Mullica River are impaired. The two waterways require TMDL's. The following is a list of their impairments and the priorities designated by NJDEP.

<u>Waterway</u>	<u>Impairment</u>	<u>Priority</u>
Batsto River	pH	Medium
Indian Mills Brook	pH	Medium
Indian Mills Brook	Pineland Biological Community	Low
Mullica River	Dioxin	High
Mullica River	Mercury	High
Mullica River	PCB	High
Mullica River	Dissolved Oxygen	Medium
Mullica River	Copper	High
Mullica River	Lead	High
Mullica River	Zinc	High
Mullica River	Total Coliform	High

FIGURE C-2: TOWNSHIP AND ITS WATERWAYS

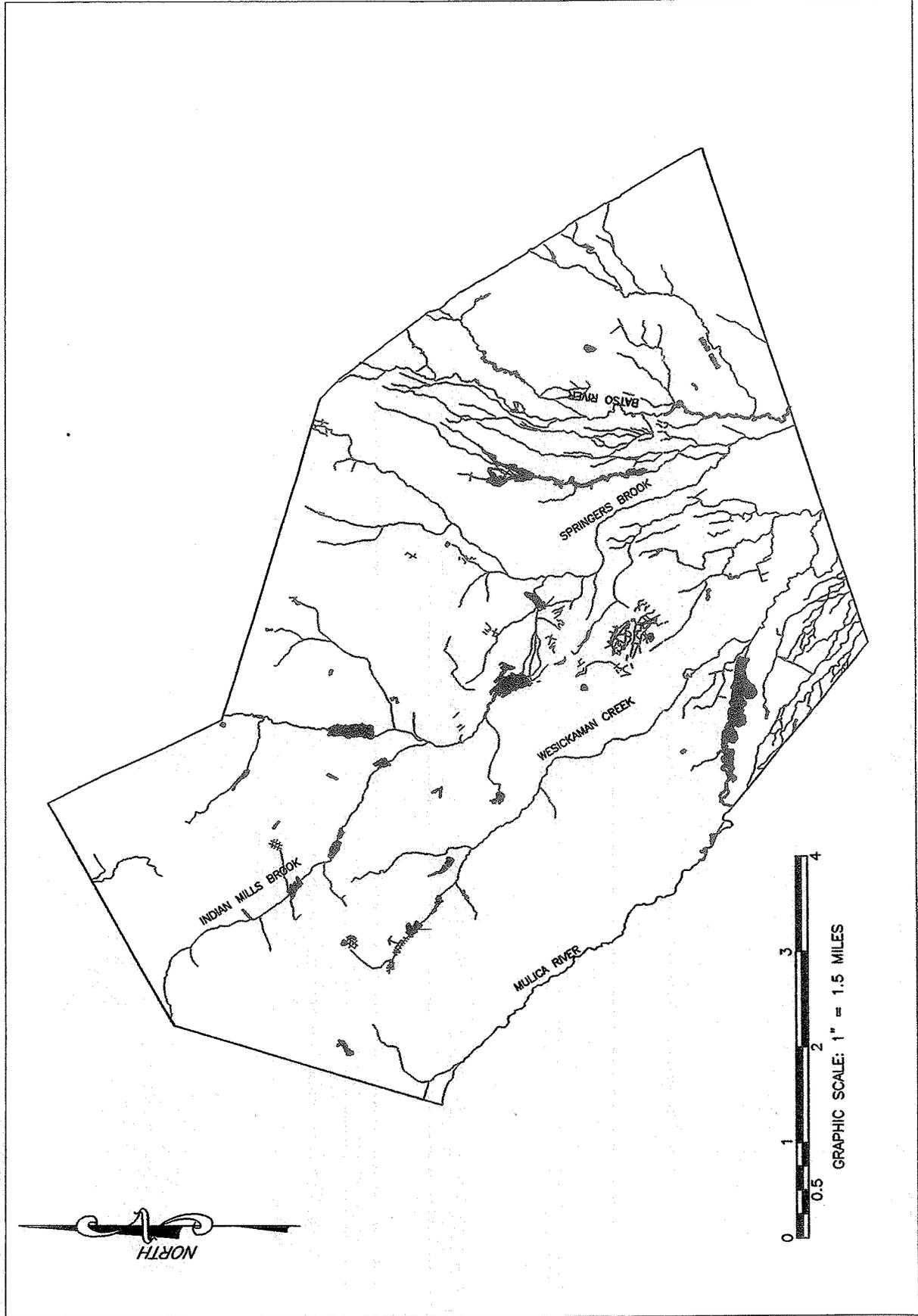
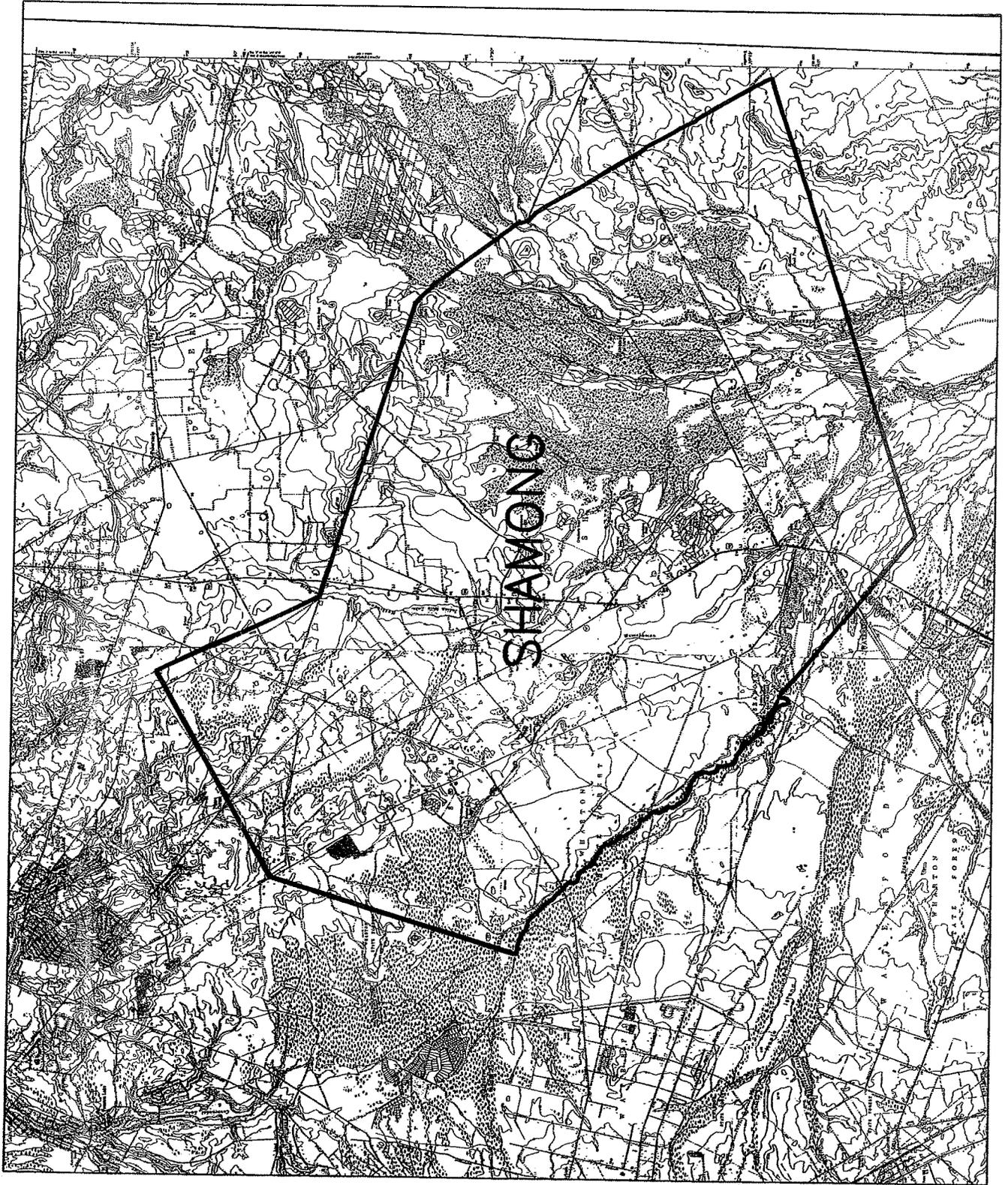


FIGURE C-3: TOWNSHIP BOUNDARY ON USGS QUADRANGLE



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Figure C-1 Groundwater Recharge in the Hydrologic Cycle.

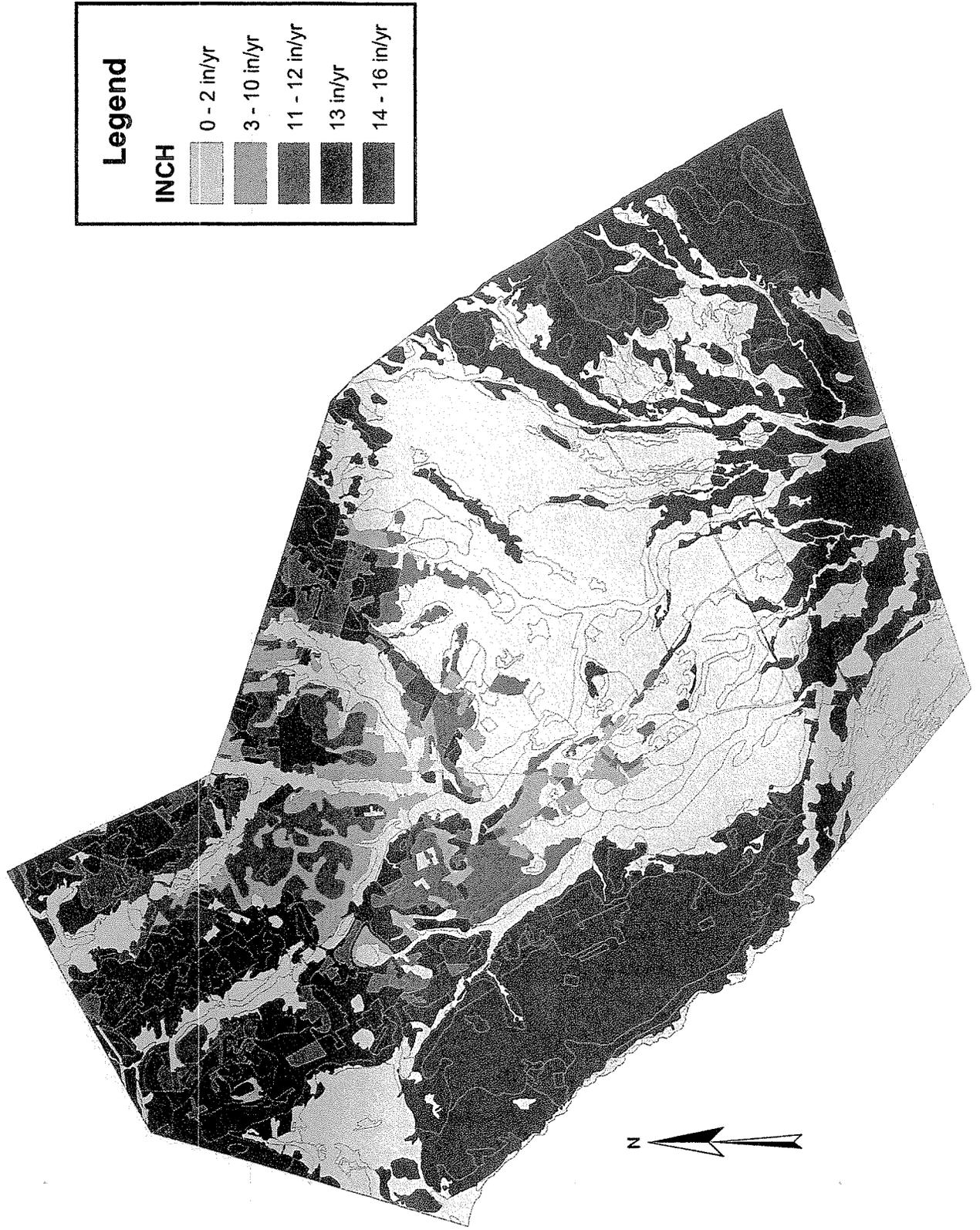
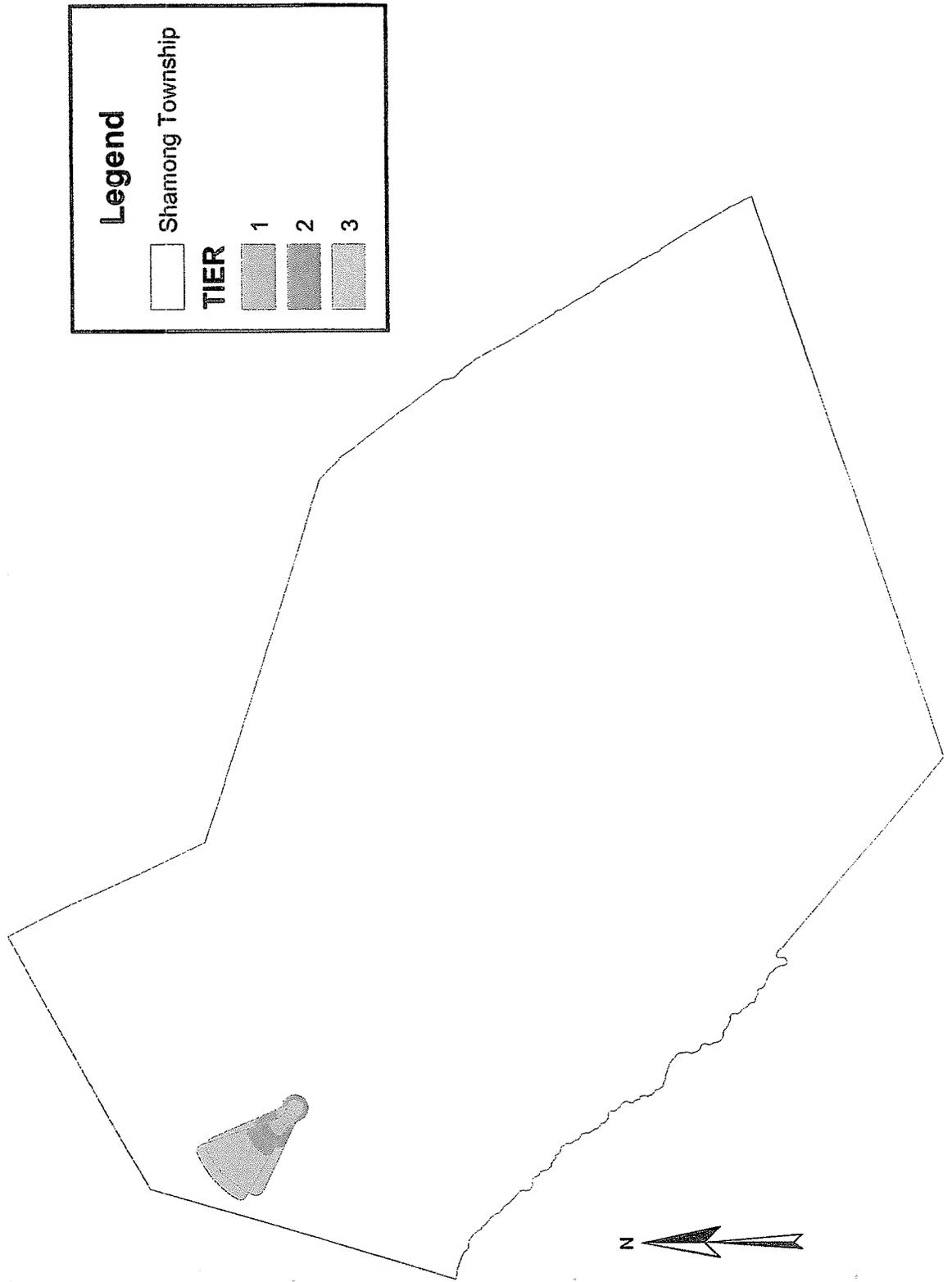


Figure C-5. Wellhead Protection Areas in the Township



Design and Performance Standards

The Township of Shamong will adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 and N.J.A.C. 7:50-684 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The operation and maintenance of stormwater facilities will be assured via the adoption and enforcement of the stormwater control ordinance developed by the NJDEP and Pinelands Commission. The ordinances will be submitted to the county for review and approval within [24 months of the effective date of the Stormwater Management Rules.] During construction, Township inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

Plan Consistency

The Township is not within a Regional Stormwater Management Planning Area and no TMDLs have been developed for waters within the Township; therefore this 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 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. This Municipal Stormwater Management Plan is consistent with all requirements and complies with all regulations promulgated under the Pinelands Comprehensive Management Plan and all future modification or amendments to the Comprehensive Management Plan shall be incorporated herein. The Township's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Township inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

Nonstructural Stormwater Management Strategies

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

Chapter 110 of the Township Code, entitled Land Development, was reviewed with regard to incorporating nonstructural stormwater management strategies. Nonstructural strategies are as follows:

Section 110-89: Conservation Easement, Natural Features

- B. Natural features. Natural features such as trees, brooks, swamps, hilltops and views shall be preserved whenever possible in designing any subdivision containing such features. Buffer strips may be required on all wooded tracts around the perimeter or rear of the development. Such buffer strips, however, may be used in calculating the area of individual lots. On individual lots, care shall be taken to preserve selected trees to enhance soil stability and the landscape treatment of the area.
- C. Conservation easement.
- (1) Where the Master Plan or Official Map of the Township delineates floodplains and other critical areas, floodplains and conservation easements shall be delineated on the plat. A conservation easement and floodplain shall prohibit the removal of trees and ground cover except for the following purposes:
 - (a) The removal of dead or diseased trees;
 - (b) Limited thinning of trees and growth to encourage the most desirable growth;
 - (c) The removal of trees to allow for structures designed to impound water or in areas to be flooded in the creation of ponds or lakes.

Section 110-91: Buffers and Landscape screen plantings

- A. Buffer areas shall require site plan approval and are required along all lot lines and street lines which separate a townhouse, apartment, or nonresidential use from either an existing residential use or residential zoning district. Buffer areas shall be developed in an aesthetic manner for the primary purpose of providing landscaped setback, of screening view or reducing noise perception beyond the lot. They are primarily between uses. Screen plantings are used to setback improved areas from a property line although the words are used interchangeably throughout this chapter. Widths shall be measured horizontally and perpendicular to lot and street lines. No structure, activity, storage of materials, or parking of vehicles shall be permitted in a buffer or screen planting area. The location and design of buffer areas are intended to provide flexibility in providing effective buffers. The location and design of buffers shall consider the use of the portion of the property being screened, the distance between the use and the adjoining property line, differenced in elevations, the type of buffer such as dense planting, existing woods, a wall or fence, buffer height, buffer width, and other combinations of man-made and natural features. The buffer shall be designed, planted, graded, landscaped and developed with the general guideline that the closer a use or activity is to a property line, or the more intense the use, the more effective the buffer area must be in obscuring light and vision and reducing noise beyond the lot. The width of both the buffer and the screen planting may be reduced by the Board reviewing the development if the design of the buffer or screen planting, including but not limited to the elevation or berming, the intensity or degree of landscaping, or the location warrants or if no useful purpose is served by the buffer or screen planting due to its location on the site or because of the adjacent uses involved.

Section 110-108: Recreational Facilities and Open Space

- A. Active recreational facilities together with associated open space shall be provided for each residential development when the development exceeds five dwelling units. Recreation facilities shall be provided in accordance with the table and provisions set forth below. The table acknowledges the fact that lot sizes are adequate to provide on site for the recreation of toddlers and small children but the purpose of this provision is to protect the need of older children and adults for recreational activities that necessitate common open space. For cluster housing developments, the active recreation facilities plus parking areas shall be located in that open space area derived as a result of clustering the dwelling units. For cluster housing developments in any of the Rural Development Area Districts a maximum of 10% of the land may be deemed public open space that is to be used for active recreational facilities, provided that only land exceeding 3.2 acres per unit may be used for this purpose. The remainder of the land must be dedicated through deed restriction for no further development including no further active public open space uses. In other single-family detached housing developments, where any of the lots are less than 3.2 acres in size, 10% of the land will be dedicated for both active and passive open space, unless less land is needed in the Board's opinion based on the lot layout and arrangement and/or size and number of the lots. An area sufficient in size to accommodate the active recreation facility plus the associated required off-street parking shall be located in the common open space area, in accordance with the table set forth below: **[Amended 4-3-1990 by Ord. No. 1990-1; 9-4-1990 by Ord. No. 1990-7]**

Type of Recreation Facility	Minimum Area
Tennis court	10,000 square feet plus parking area
Basketball court	8,000 square feet
Multipurpose field area	2 acres plus parking area

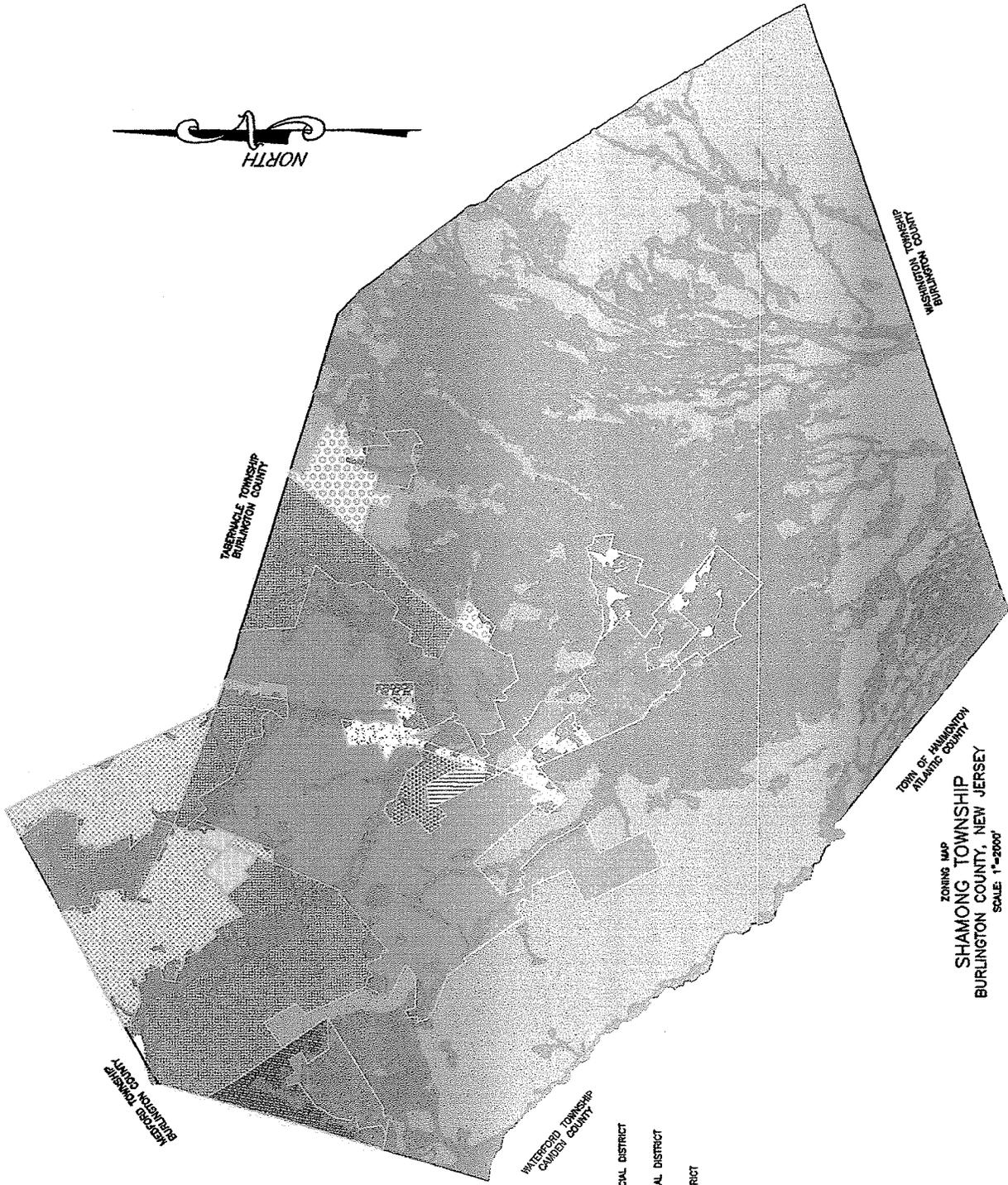
Section 110-110: Density Transfer Program

- A. The owner of the lot proposed for development acquires sufficient vacant contiguous or noncontiguous land which, when combined with the acreage of the lot proposed for development, equals at least 18.6 acres if development is proposed in the forest area District, 3.9 acres if development is proposed in the RD-1 District, 3.2 acres if development is proposed in the RD-2 District, 3.6 acres if development is proposed in the RD-3 District and 6/7 acres if development is proposed in the RD-4 District.

Land Use/Build-Out Analysis

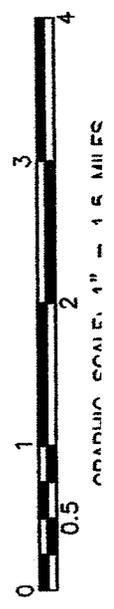
A detailed land use analysis for the Township was conducted. Figure C-6 illustrates the existing land use in the Township based on 1995/97 GIS information from NJDEP. Figure C-7 illustrates the HUC14s within the Township. The Township zoning map is shown in Figure C-8. Figure C-9 illustrates the constrained lands within the Township. The build-out calculations for impervious cover are shown in Table C-1. As expected when developing agricultural and forest lands, the build-out of these two HUC14s will result in a significant increase in impervious surfaces. Table C-2 presents the pollutant loading coefficients by land cover. The pollutant loads at full build-out are presented in Table C-3.

FIGURE C-6: TOWNSHIP'S EXISTING LAND USE



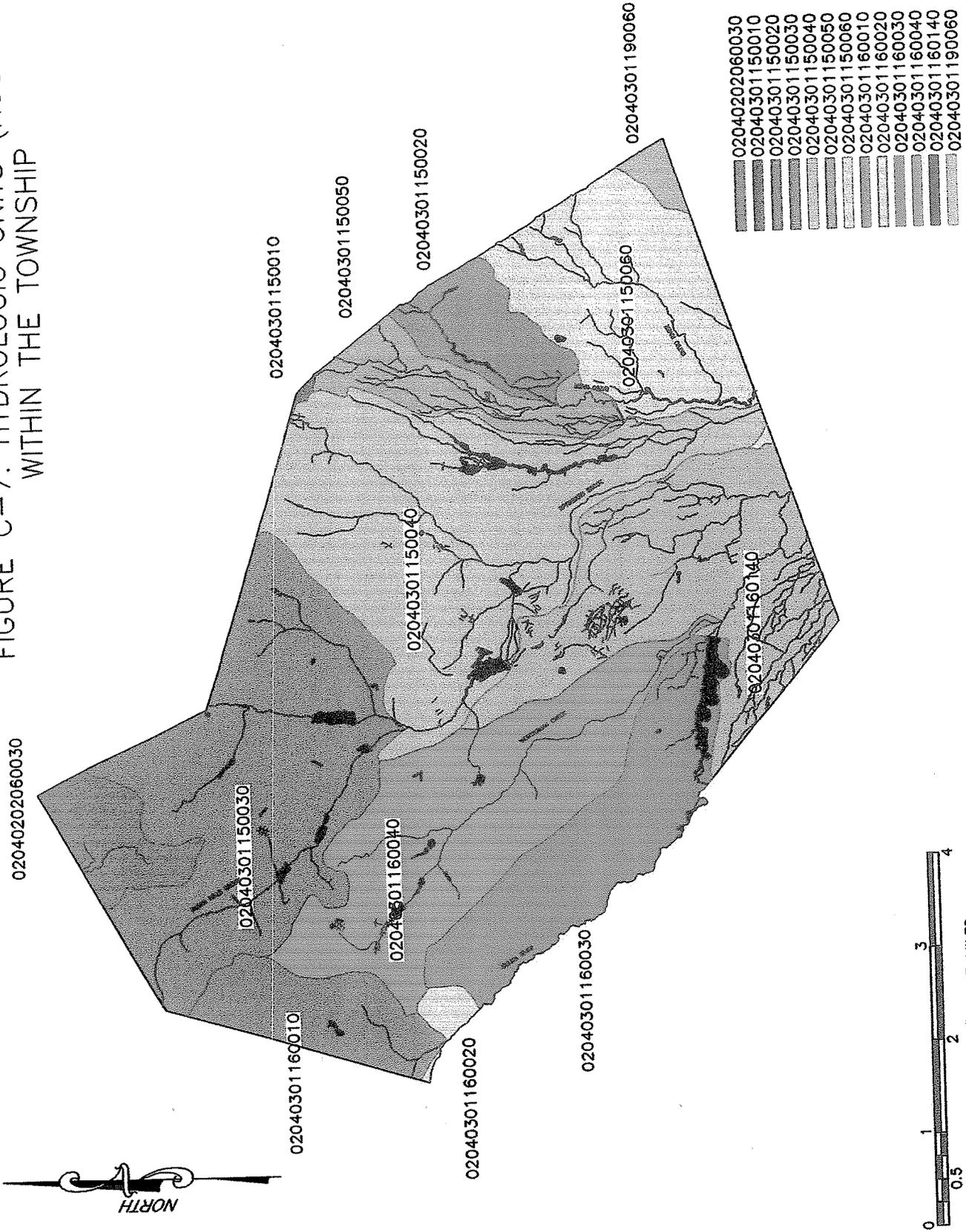
LEGEND

[Solid Grey]	AGRICULTURAL PRODUCTION AREA
[White]	SPECIAL AGRICULTURAL
[Diagonal Lines /]	FOREST AREA
[Diagonal Lines \]	INFILL-RESIDENTIAL DISTRICT
[Cross-hatch]	PINELANDS VILLAGE-VILLAGE COMMERCIAL DISTRICT
[Vertical Lines]	PINELANDS VILLAGE-VILLAGE INDUSTRIAL DISTRICT
[Horizontal Lines]	PINELANDS VILLAGE-RESIDENTIAL DISTRICT
[Dotted]	REGIONAL GROWTH AREA
[White]	REGIONAL GROWTH COMMERCIAL
[Diagonal Lines /]	RURAL DEVELOPMENT AREA
[Diagonal Lines \]	RURAL DEVELOPMENT COMMERCIAL
[Solid Grey]	PRESERVATION AREA
[Diagonal Lines /]	PINELANDS VILLAGE-OFFICE
[Diagonal Lines \]	AGRICULTURAL-COMMERCIAL
[Cross-hatch]	PINELANDS VILLAGE-COMMERCIAL II
[Diagonal Lines /]	PINELANDS VILLAGE-COMMERCIAL II



ZONING MAP
SHAMONG TOWNSHIP
 BURLINGTON COUNTY, NEW JERSEY
 SCALE: 1"=2000'

FIGURE C-7: HYDROLOGIC UNITS (HUC 14'S)
WITHIN THE TOWNSHIP



02040202060030

02040301150030

02040301160010

02040301160040

02040301160020

02040301160030

02040301150040

02040301150050

02040301150020

02040301150010

02040301160140

02040301150060

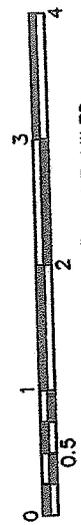
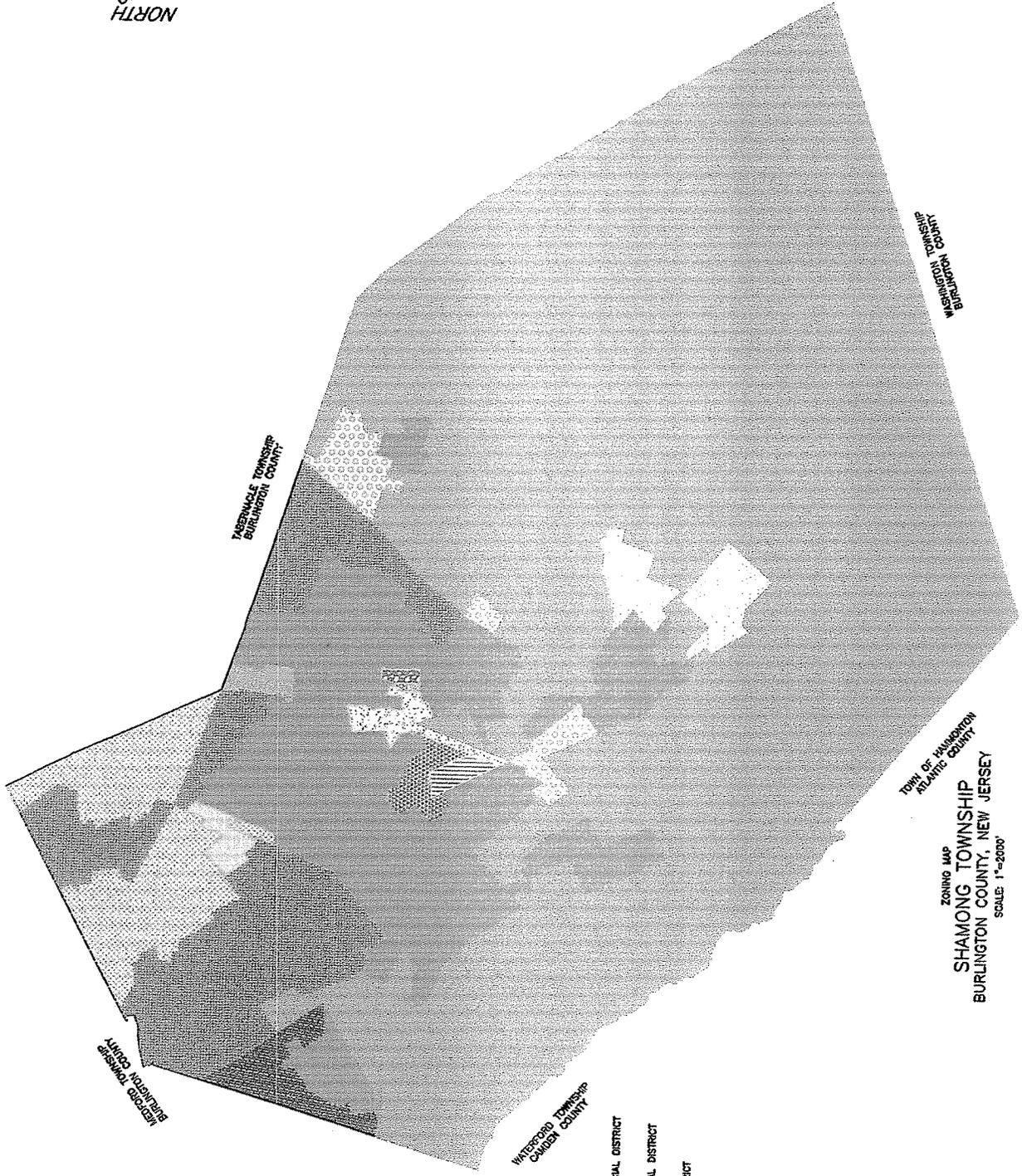


FIGURE C-8: ZONING DISTRICTS WITHIN THE TOWNSHIP



- LEGEND**
- AGRICULTURAL PRODUCTION AREA
 - SPECIAL AGRICULTURAL
 - FOREST AREA
 - INFILL-RESIDENTIAL DISTRICT
 - PINELANDS VILLAGE-VILLAGE COMMERCIAL DISTRICT
 - PINELANDS VILLAGE-VILLAGE INDUSTRIAL DISTRICT
 - PINELANDS VILLAGE-RESIDENTIAL DISTRICT
 - REGIONAL GROWTH AREA
 - REGIONAL GROWTH COMMERCIAL
 - RURAL DEVELOPMENT AREA
 - RURAL DEVELOPMENT COMMERCIAL
 - PRESERVATION AREA
 - PINELANDS VILLAGE-OFFICE
 - AGRICULTURAL-COMMERCIAL
 - PINELANDS VILLAGE-COMMERCIAL II

ZONING MAP
SHAMONG TOWNSHIP
 BURLINGTON COUNTY, NEW JERSEY
 SCALE: 1"=2000'



GRAPHIC SCALE: 1" = 1.5 MILES

FIGURE C-9: WETLANDS AND WATER LAND USES WITHIN THE TOWNSHIP—CONSTRAINED LAND

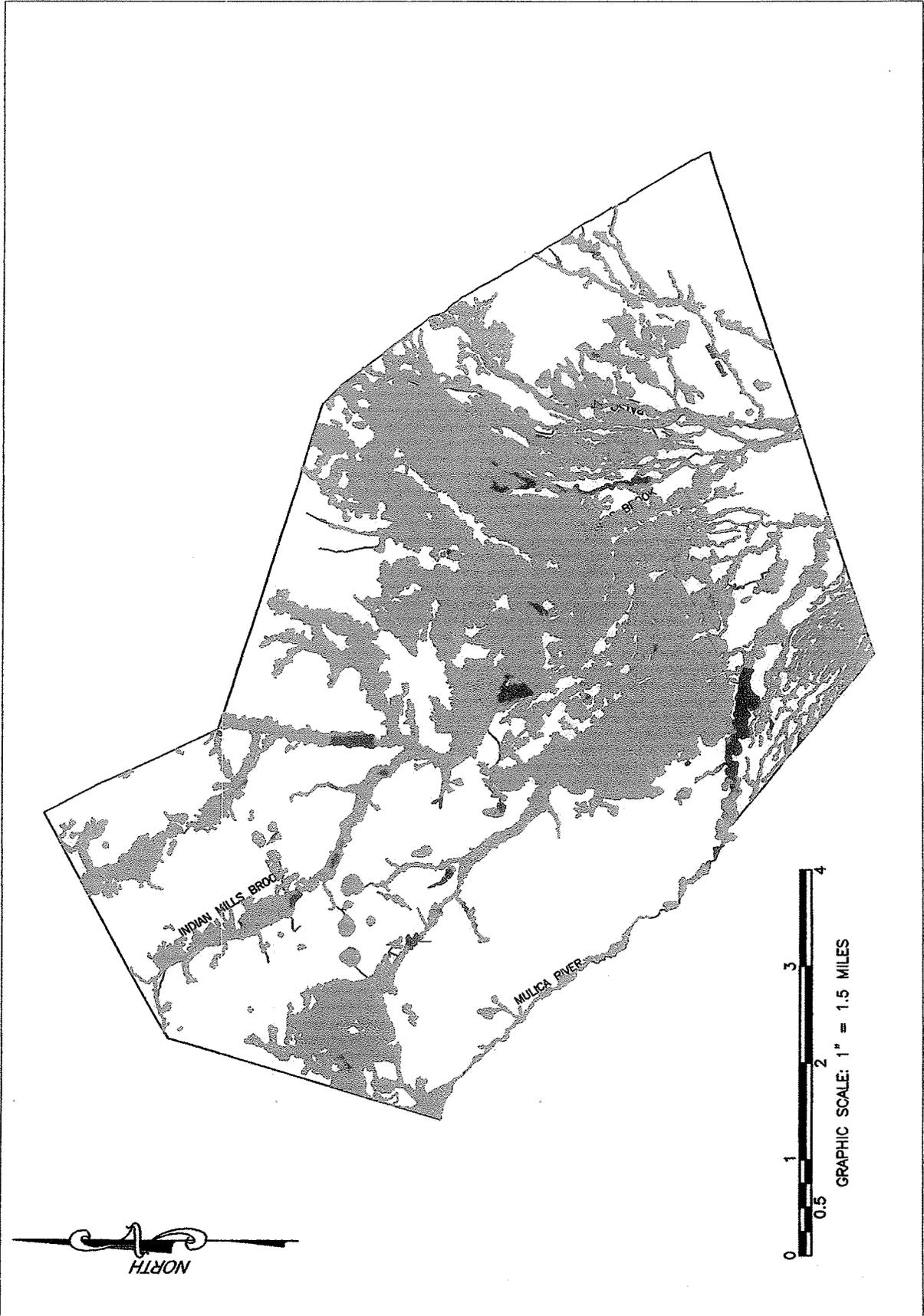


Table C-1: Build-Out Calculations for HUC14s

HUC14 and Zone	Total Area (acres)	Existing Impervious (%)	Existing Impervious (acres)	Wetlands/ Water Area (acres)	Developable Area (acres)	Allowable Impervious (%)	Build-Out Impervious (acres)
2040202060030							
Regional Growth Commercial	473.21			10.54	462.67	30	138.801
Rural Development Area	326.94			179.03	57.91	30	17.373
2040301150010							
Preservation Area	20.66			6.12	14.54	1	0.1454
2040301150020							
Preservation Area	961.19			295.31	665.88	1	6.6588
2040301150030							
Agricultural Production Area	2060.67			494.8	1565.69	30	469.707
Pinelands Village-Commercial District	100.74			11.32	89.42	30	26.826
Pinelands Village-Industrial District	5.48			0	5.48	30	1.644
Pinelands Village-Residential District	125.12			15.09	110.02	30	33.006
Regional Growth Area	822.6			40.69	781.91		0
Regional Growth Commercial	98.8			5.9	72.9	30	21.87
Rural Development Area	1924.01			438.77	1485.24	30	445.572
Rural Development Commercial	62.98			43.62	19.36	30	5.808
Preservation Area	42.6			20.74	21.87	1	0.2187
Pinelands Village-Office	5.33			0.22	5.11	30	1.533
Agricultural-Commercial	16.86			2.51	14.35		0
Pinelands Village-Commercial II	23.79			0.56	23.23	30	6.969
2040301150040							
Agricultural Production Area	407.67			140.74	266.93	30	80.079
Special Agricultural	130.69			95.39	35.3	30	10.59
Infill Residential District	277.24			6.96	270.28	30	81.084
Pinelands Village-Commercial District	18.79			0	18.79	30	5.637
Pinelands Village-Industrial District	1.34			0	1.34	30	0.402
Pinelands Village-Residential District	12.24			0.65	11.59	30	3.477
Rural Development Area	86.49			4.38	82.11		0
Preservation Area	4965.06			3496.47	1468.59	1	14.6859
2040301150050							
Preservation Area	1069.95			671.24	671.24	1	6.7124
2040301150060							
Preservation Area	2917.5			515.89	2401.61	1	24.0161
2040301160010							
Agricultural Production Area	213.34			168.27	45.07	30	13.521

Forest Area	275.22			78.69	196.69	1	1.9669
Rural Development Area	174.94			0.76	174.18		0
Preservation Area	578.73			307.29	271.44	1	2.7144
2040301160020							
Preservation Area	163.43			6.46	156.96	1	1.5696
2040301160030							
Agricultural Production Area	3.82			0	3.82	30	1.146
Preservation Area	2528.3 9			369.79	2158.52	1	21.5852
2040301160140							
Agricultural Production Area	286.38			138.12	148.26		0
Special Agricultural	321.42			261.57	59.85		0
Infill Residential District	16.87			10.58	6.29	30	1.887
Preservation Area	3215.9			1573.1 1	1642.79	1	16.4279
2040301160040							
Agricultural Production Area	1333.1 6			166.73	1166.43	30	349.929
Forest Area	14.37			5.54	8.83	1	0.0883
Infill Residential District	111.3			24.91	86.39	30	25.917
Pinelands Village- Commercial District	17.1			0	17.1	30	5.13
Pinelands Village-Industrial District	54.54			1.87	52.67	30	15.801
Pinelands Village- Residential District	10.17			2.89	7.28	30	2.184
Rural Development Area	113.04			0.68	112.36		0
Preservation Area	2348.1			1094.4 1	1253.69	1	12.5369
2040301190060							
Preservation Area	170.4			0	170.4	1	1.704
TOTALS	28908. 57	0	0	10708. 61	18362.38	764	1876.92 35

Table C-2: Pollutant Loads by Land Cover

Land Cover	Total Phosphorus Load (lbs/acre/year)	Total Nitrogen Load (lbs/acre/year)	Total Suspended Solids Load (lbs/acre/year)
High, Medium Density Residential	1.4	15	140
Low Density, Rural Residential	0.6	5	100
Commercial	2.1	22	200
Industrial	1.5	16	200
Urban, Mixed Urban, Other Urban	1	10	120
Agricultural	1.3	10	300
Forest, Water, Wetlands	0.1	3	40
Barrenland/Transitional Area	0.5	5	60

Table C-3: Nonpoint Source Loads at Build-Out

HUC14 and Zone	Build-Out Zoning	Developable Area (acres)	TP (lbs/acre/year)	TP (lbs/year)	TN (lbs/acre/year)	TN (lbs/year)	TSS (lbs/acre/year)	TSS (lbs/year)
2040202060030								
Low Density/ Rural Residential		57.91	0.6	34.746	5	289.55	100	5791
Commercial		462.67	2.1	971.607	22	10178.74	200	92534
Forest, Water, Wetlands		189.57	0.1	18.957	3	568.71	60	11374.2
2040301150010								
Forest, Water, Wetlands		6.12	0.1	0.612	3	18.36	60	367.2
Barrenland/Transition Area		14.54	0.5	7.27	5	72.7	60	872.4
2040301150020								
Forest, Water, Wetlands		295.31	0.1	29.531	3	885.93	60	17718.6
Barrenland/Transition Area		665.88	0.5	332.94	5	3329.4	60	39952.8
2040301150030								
Low Density Residential		2377.17	0.6	1426.302	5	11885.85	100	23771.7
Agricultural		1565.69	1.3	2035.397	10	15656.9	300	46970.7
Commercial		244.37	2.1	513.177	22	5376.14	200	48874
Industrial		5.48	1.5	8.22	16	87.68	200	1096
Barrenland/Transition Area		21.87	0.5	10.935	5	109.35	60	1312.2
Forest, Water, Wetlands		1074.22	0.1	107.422	3	3222.66	60	64453.2
2040301150040								
Low Density Residential		363.98	0.6	218.388	5	1819.9	100	36398
Commercial		18.79	2.1	39.459	22	413.38	200	3758
Industrial		1.34	1.5	2.01	16	21.44	200	268
Agricultural		302.23	1.3	392.899	10	3022.3	300	90669
Forest, Water, Wetlands		3744.59	0.1	374.459	3	11233.77	60	22467.5.4
Barrenland/Transition Area		1468.59	0.5	734.295	5	7342.95	60	88115.4
2040301150050								
Forest, Water, Wetlands		671.24	0.1	67.124	3	2013.72	60	40274.4
Barrenland/Transition Area		398.71	0.5	199.355	5	1993.55	60	23922.6
2040301150060								
Forest, Water, Wetlands		515.89	0.1	51.589	3	1547.67	60	30953.4

Barrenland/Transition Area		2401.61	0.5	1200.805	5	12008.05	60	144096.6
2040301160010								
Low Density Residential		174.18	0.6	104.508	5	870.9	100	17418
Agricultural		45.07	1.3	58.591	10	450.7	300	13521
Forest, Water, Wetlands		751.54	0.1	75.154	3	2254.62	60	45092.4
Barrenland/Transition Area		271.44	0.5	135.72	5	1357.2	60	16286.4
2040301160020								
Forest, Water, Wetlands		6.46	0.1	0.646	3	19.38	60	387.6
Barrenland/Transition Area		156.96	0.5	78.48	5	784.8	60	9417.6
2040301160030								
Agricultural		3.82	1.3	4.966	10	38.2	300	1146
Forest, Water, Wetlands		369.79	0.1	36.979	3	1109.37	60	22187.4
Barrenland/Transition Area		2158.52	0.5	1079.26	5	10792.6	60	129511.2
2040301160140								
Agricultural		208.11	1.3	270.543	10	2081.1	300	62433
Low Density Residential		6.29	0.6	3.774	5	31.45	100	629
Forest, Water, Wetlands		1983.38	0.1	198.338	3	5950.14	60	119002.8
Barrenland/Transition Area		1642.79	0.5	821.395	5	8213.95	60	98567.4
2040301160040								
Low Density Residential		206.03	0.6	123.618	5	1030.15	100	20603
Commercial		17.1	2.1	35.91	22	376.2	200	3420
Industrial		52.67	1.5	79.005	16	842.72	200	10534
Agricultural		1166.43	1.3	1516.359	10	11664.3	300	34992.9
Forest, Water, Wetlands		1310.86	0.1	131.086	3	3932.58	60	78651.6
Barrenland/Transition Area		1253.69	0.5	626.845	5	6268.45	60	75221.4
20403011090060								
Barrenland/Transition Area		170.4	0.5	85.2	5	852	60	10224
TOTALS								
		28823.3		14243.88		152019.5		2759083

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. An applicant must meet the design and performance standards to the maximum extent practical even when a mitigation plan exists. Prior to the Township granting any waiver, exemption or variance from the stormwater management design and performance standards, the applicant must submit the Requirements for Mitigation Projects discussed below, and after submission of same, petition the Planning Board for re-adoption of the Stormwater Management Plan to provide for the proposed mitigation project.

Sensitive Receptors

Sensitive receptors are areas with specific sensitivity to impacts of stormwater, whether through changes in stormwater runoff quality, stormwater runoff quantity and groundwater recharge.

The sensitive receptors for the Township are identified as follows:

Stormwater Quality

- Threatened and Endangered Species habitats
- Drinking Water Supplies
- Impoundments
- Category One Waters
- Trout associated waters

Stormwater Quantity

- Inadequate culverts
- Properties subject to flooding
- Eroding Streams
- Freshwater Wetlands
- Category One Waters

Groundwater Recharge

- Springs, seeps and wetlands
- White cedar swamps
- Threatened and Endangered species sensitive to groundwater changes
- Aquifers
- Streams with low base flow
- Category One Waters

Any developer wishing to use a mitigation plan for a variance or exemption will be required to map the sensitive receptors to identify the location for the mitigation project directly associated with the application project. Any proposed mitigation project must not have any additional negative impact to sensitive receptors.

Criteria for Selecting Mitigation Projects

The following criteria should be used for selecting projects for mitigation purposes.

1. The project must be within the same area that would contribute to the receptor impacted by the project. If there is no specific receptor impacted, then the location of the mitigation project must be in the Pinelands Area and within the same drainage area as the parcel proposed for development.
2. Legal authorization must be obtained to construct the project at the location selected. This includes the maintenance and any access needs for the project in the future.
3. The project should be close to the location of the original project, and if possible, be located upstream at a similar distance from the identified sensitive receptor. This distance should not be based on actual location, but on a similar hydraulic distance to the sensitive receptor. For example, if the project for which a waiver is obtained discharges to a tributary, but the closest location discharges to the main branch, it may be more beneficial to identify a location discharging to the same tributary.
4. It is preferable to have one location that addresses any and all of the performance Standards waived, rather than one location for each performance standard.
5. The project location must demonstrate no adverse impacts to other properties.
6. For projects addressing the groundwater recharge performance standard, a Mitigation project site upstream of the location of the actual project site is preferable to a downstream location.
7. Mitigation projects that address stormwater runoff quantity can choose to provide storage for proposed increases in runoff volume, as opposed to a direct peak flow reduction.
8. Mitigation projects that address stormwater runoff quality can choose to address another pollutant other than TSS, which has been demonstrated to be of particular concern, such as streams listed as an impaired waterbody in the Integrated List (Sublist 5). Care should be taken that waivers from the TSS requirement do not result in impairment of an existing unimpaired area.

Identification of Specific Mitigation Projects

The Township has not identified specific mitigation projects. Acceptable mitigation sites and projects will be determined by the Township Planning Board or Township Committee.

The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project or towards the development of a Regional Stormwater Management Plan. The funding option should only be used when the project given the waiver will not immediately impact a sensitive receptor. The amount of such in lieu contributions must be equivalent to the cost of implementing and maintaining the stormwater management measures for which an exception is granted. The Township must expend these contributions within five

years of their receipt. The receipt of the financial contribution should be considered the completion of the mandatory mitigation for the project.

Requirement for Mitigation Projects

The following requirements for mitigation projects must be included in the project submissions.

1. Impact from noncompliance

Provide a table to show the required values, and the values provided in the project, and include an alternatives analysis demonstrating that on-site compliance was maximized.

2. Narrative and supporting information regarding the need for the waiver.

The waiver cannot be due to a condition created by the applicant. If the applicant can provide compliance with the Stormwater Management rules through a reduction in the scope of the project, the applicant has created the condition and a waiver **cannot** be issued.

- A discussion and supporting information of the site conditions that would not allow the construction of a stormwater management facility to provide compliance with these requirements, **AND/OR** if the denial of the application would impose an extraordinary hardship on the applicant brought about by circumstances peculiar to the subject property. Site conditions to be considered are soil type, the presence of karst geology, acid soils, a high groundwater table, unique conditions that would create an unsafe design, as well as conditions that may provide a detrimental impact to public health, welfare, and safety.

3. Sensitive Receptor.

Identify the sensitive receptor related to the performance standard from which a waiver is sought. Demonstrate that the mitigation site contributes to the same sensitive receptor.

4. Design of the Mitigation Project

Provide the design details of the mitigation project. This includes, but is not limited to, drawings, calculations, and other information needed to evaluate the mitigation project.

5. Responsible Party:

List the party or parties responsible for the construction and the maintenance of the mitigation project. Documentation must be provided to demonstrate that the responsible party is aware of, has authority to perform, and accepts the responsibility for the construction and maintenance of the mitigation project. Under no circumstance shall the responsible party be an individual single-family homeowner.

6. Maintenance

Include a maintenance plan that addresses the maintenance criteria at N.J.A.C. 7:8-5.8 as part to the mitigation plan. In addition, if the maintenance responsibility is being transferred to the municipality or another entity, the entity responsible for the cost of the maintenance must be identified. The municipality may provide the option for the applicant to convey the mitigation project to the municipality, if the applicant provides for the cost of maintenance in perpetuity.

7. Permits

Obtain any and all necessary local, State or other applicable permits for the mitigation measure or project. These must be obtained prior to the municipal approval of the project for which mitigation is being provided.

8. Construction

Demonstrate that the construction of the mitigation project coincides with the construction of the proposed project. A certificate of occupancy or final approval by the municipality for the application project cannot be issued until the mitigation project or measure receives final approval. Any mitigation projects proposed by the municipality to offset the stormwater impacts of that municipality's own projects must be completed within 6 months of the completion of the municipal project, in order to remain in compliance with their NJPDES General Permit.