

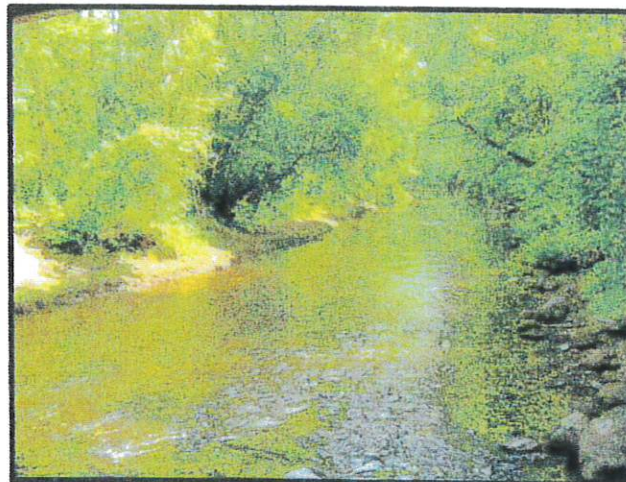
INDEPENDENCE TOWNSHIP
STORMWATER MANAGEMENT
PLAN

INDEPENDENCE TOWNSHIP, WARREN COUNTY, NEW JERSEY

Adopted SEPTEMBER, 2005

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INTRODUCTION

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for Independence Township (“the Township”) to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules and due within twelve months of the effective date of the Township’s stormwater permit authorization. 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 also describes long-term operation and maintenance measures for existing and future stormwater facilities.

The MSWMP is required to be updated on an ongoing basis at each municipal review of the Township’s Master Plan. As part of each update the Township also reviews its Zoning and Land Development ordinances as deemed necessary to better meet stormwater management goals. This current MSWMP revision includes required provisions from new NJDEP Stormwater Rules at N.J.A.C. 7:8 adopted in January of 2020 and the January 2016 Highlands Region Stormwater Management Program Guidance Document (rev. March 2020). The update includes a “build-out” analysis based upon existing zoning and land available for development and provides mitigation options for instances where a variance or exemption from required design and performance standards is sought. Specific stormwater management measures to mitigate variances or exemptions are incorporated into this plan. The Township’s SWM Ordinance is also in the process of being updated to conform with the newly adopted NJDEP Stormwater Rules and Highlands Guidance Document.

I. 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.

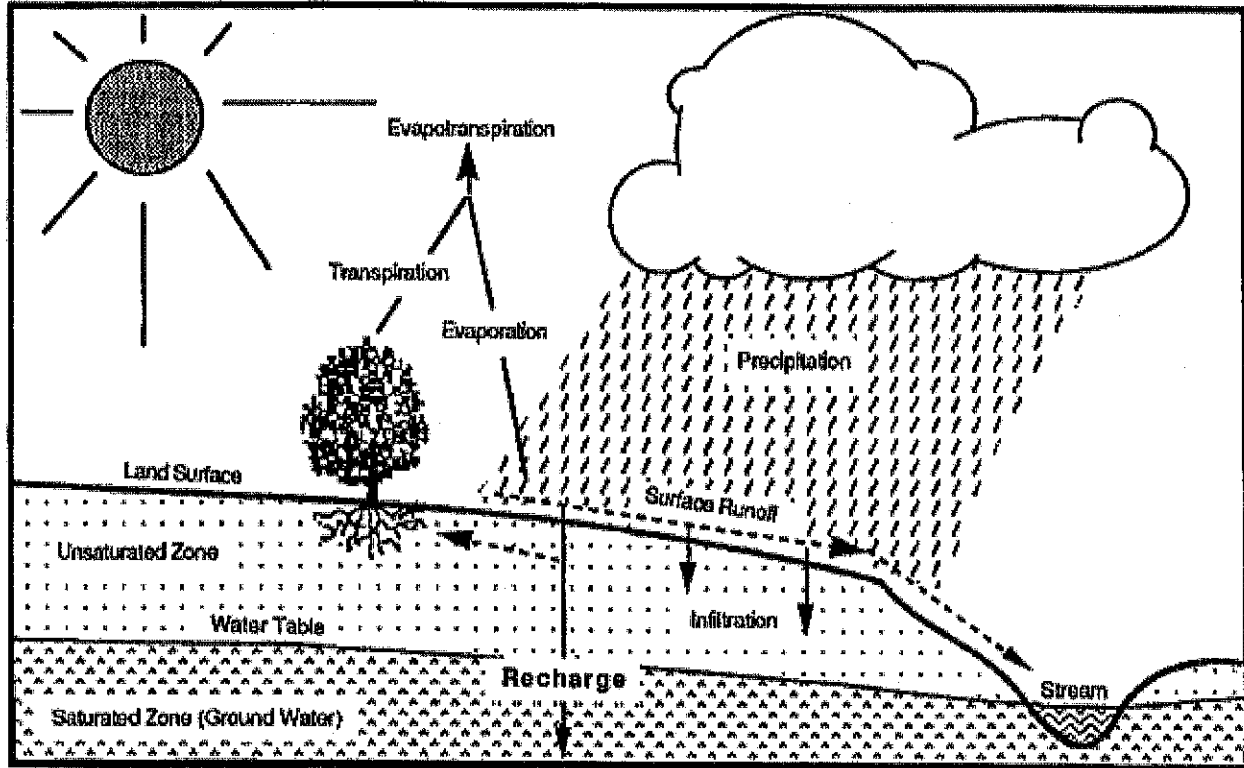
To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventive and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

II. 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 that, 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 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.

III. BACKGROUND

Independence Township encompasses approximately 20 square miles in Warren County, New Jersey. Township population has decreased from 5,662 (2010 census) to 5,444 (2020 Census). Irrespective of the slight population decrease, new development has the potential to increase stormwater runoff volumes and pollutant loads to the waterways of the municipality.

Figure 2 illustrates the waterways in the Township while Figure 3 depicts the Township boundaries on the USGS quadrangle map. The major waterway in the Township is the Pequest River and its associated tributaries. There are several streams or tributaries in the Township that are classified by the State as Category 1. This classification subjects the land adjacent to the stream to a 300-ft. buffer. The Category 1 streams are highlighted as such on Figure 2.

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 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 Total Maximum Daily Loads (TMDLs) are needed.

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, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

Based upon NJDEP's TMDL Look Up Tool the following TMDL's are currently in effect:

1. Fecal Coliform – Musconetcong River at Beattystown
2. Fecal Coliform – Pequest River at Belvidere
3. Fecal Coliform – Pohatcong Creek at River Road Bridge
4. Phosphorus – Bear Creek
5. Phosphorus – Pequest River (Cemetery Road to Dragstrip)
6. Phosphorus – Pequest River (Dragstrip below Bear Swamp)
7. Phosphorus – Pequest River (Furnace Brook to Cemetery Road)
8. Phosphorus – Pequest River (Below Bear Swamp to Trout Brook)
9. Phosphorus – Ghost Lake

IV. DESIGN AND PERFORMANCE STANDARDS

The Township 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. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules as defined in 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 and standards for incorporation of Green Infrastructure pursuant to N.J.A.C. 7:8-5.3. During construction, Township inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

V. PLAN CONSISTENCY

The Township lies within the Highlands Region. This stormwater management plan is established to be consistent with the Highlands Regional Master Plan for those portions of the Township which are contained within the Highlands Preservation Area and to be consistent with the requirements in N.J.A.C. 7:8 Stormwater Management for Municipal Stormwater Management Plans.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) as defined in N.J.A.C. 5:21. The municipality utilizes the most current update of the RSIS in the stormwater management review of residential areas. This Municipal Stormwater Management Plan will be revised to be consistent with any future updates to the RSIS.

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

VI. NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

The Township encourages the incorporation of the following nonstructural stormwater management strategies for all development within the township pursuant to N.J.A.C. 7:8-2.4. In addition, the Township shall review its land development and zoning ordinances as part of its required Periodic Reexamination of the Master Plan and make necessary revisions to accommodate these strategies.

1. Protect existing areas which already provide water quality benefits.
2. Minimize impervious surfaces and break up flow from impervious surfaces.
3. Protect natural drainage features and vegetation.
4. Minimize decreases in time of concentration.

5. Minimize land disturbance.
6. Provide low maintenance landscaping to minimize the use of fertilizers.
7. Provide vegetated channels and vegetated filter strips.
8. Impose source controls to limit trash, fertilizers, pesticides and spills.

VII. LAND USE/BUILD-OUT ANALYSIS

A detailed land use and build-out analysis for the Township is included with this plan.

VIII. MITIGATION PLANS

In accordance with N.J.A.C 7:8-4.6 a municipality may grant a variance from the design and performance standards for stormwater management measures as set forth in its stormwater control ordinance provided that its stormwater management plan and ordinance contain provisions for stormwater mitigation pursuant to N.J.A.C. 7:8-4.2(c)11. This plan includes the following provisions which are designed satisfy this requirement.

The municipal review agency may grant variances from the design and performance standards set forth in its stormwater control ordinance provided that the following conditions are met.

1. The applicant demonstrates that it is technically impracticable to meet any one or more of the design and performance standards onsite. For the purposes of this analysis, technical impracticability exists only when the design and performance standard cannot be met for engineering, environmental, or safety reasons. The municipality's approval of a variance shall apply to an individual drainage area and design and performance standard and shall not apply to an entire site or project, unless an applicant provides the required analysis for each drainage area within the site and each design and performance standard.
2. The applicant demonstrates that the proposed design achieves the maximum possible compliance with the design and performance standards on-site.
3. A mitigation project in accordance with the following is implemented.
 - i. The mitigation project should provide mitigation that is equivalent to the impacts for which the variance or exemption is sought.
 - ii. The mitigation project may be a project which has been established by the Township or may be a project proposed by the applicant, provided it meets the criteria in the ordinance. Potential project sites are the Independence Township Municipal complex located at 286B Rt. 46 West (Block 21, Lot 50) or the Independence Township School located at 281 Rt. 46 (Block 22, Lot 45).
 - iii. The mitigation project shall be approved no later than preliminary or final site plan approval of the major development.

- iv. The mitigation project shall be located in the same HUC 14 as the area of the major development subject to the variance.
 - v. The mitigation project shall be constructed prior to or concurrent with the major development.
 - vi. The mitigation project shall comply with the green infrastructure standards as required at N.J.A.C. 7:8-5.2(a)2. and adopted by ordinance.
- 4. The applicant shall be responsible for preventive and corrective maintenance (including replacement) of the mitigation project. This responsibility is not transferable to any entity other than a public agency, in which case, a written agreement with that public agency must be submitted to the review agency.
 - 5. Any approved variance shall be submitted by the municipal review agency to the county review agency and the Department by way of a written report describing the variance, as well as the required mitigation, within 30 days of the approval.

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
Barren Land/Transitional Land	0.5	5	60

Source: NJDEP Stormwater BMP Manual 2004

INDEPENDENCE TOWNSHIP
BUILD-OUT and POLLUTANT LOAD IMPACT

HUC 14 and ZONE	DEVELOPABLE AREA (ACRES)	ALLOWABLE IMPERVIOUS (%)	BUILD-OUT IMPERVIOUS (ACRES)
02040105090010			
AR - Special Agricultural	574	N/A	N/A
B - Business	101	50	51
COM/PROF - Commercial - Professional Office	1	50	1
I - Industry	38	30	11
R3 - Residential	52	10	5
R4 - Residential	1252	10	125
TOTALS	2018		193
02040105090020			
B - Business	164	50	82
B/IL/WT - Business/Light Industrial - Warehousing Terminal	65	50	33
COM/PROF - Commercial - Professional Office	91	50	46
OR - Office - Research	157	30	47
R 1/2 - Residential Village	22	15	3
R-1 - Medium Density Residential	36	10	4
R3 - Residential	2133	10	213
R4 - Residential	201	10	20
TOTALS	2869		448
02040105070060			
AR - Special Agricultural	127	N/A	N/A
IL - Light Industry	35	30	11
R4 - Residential	45	10	5
TOTALS	207		16
02040105160010			
B - Business	143	50	72
PRD-4 - Planned Residential Development	18	50	9
PRD-IH - Planned Residential Development - Inclusionary Housing	48	50	24
R-2 - Low Density Residential	11	10	1
R3 - Residential	779	10	78
R4 - Residential	290	10	29
TOTALS	1289		213

INDEPENDENCE TOWNSHIP
BUILD-OUT and POLLUTANT LOAD IMPACT

02040105150100			
B - Business	86	50	43
IL - Light Industry	22	30	7
R-1 - Medium Density Residential	21	10	2
R3 - Residential	505	10	51
R-M - High Density Residential	41	40	16
PRD-4 - Planned Residential Development	10	50	5
PRD-SC - Planned Residential Development - Senior	66	50	33
PSCRD - Planned Senior Citizen Residential Development	34	30	10
TOTALS	786		167
02040105080020			
AR - Special Agricultural	84	N/A	N/A
TOTALS	84		0
02040105090030			
I - Industry	144	30	43
R3 - Residential	262	10	26
R4 - Residential	5	10	1
TOTALS	411		70
02040105100010			
AR - Special Agricultural	1	N/A	N/A
R4 - Residential	397	10	40
TOTALS	398		40
02040105140010			
R3 - Residential	167	10	17
R4 - Residential	177	10	18
TOTALS	344		35
TOTAL ALL HUCs	8406.00		1182.00

INDEPENDENCE TOWNSHIP
BUILD-OUT and POLLUTANT
LOAD IMPACT

HUC 14 and Zone	Developable Area	TP	TP	TN	TN	TSS	TSS
	(acres)	(lbs/acre/yr)	(lbs/yr)	(lbs/acre/yr)	(lbs/yr)	(lbs/acre/yr)	(lbs/yr)
02040105090010							
AR - Special Agricultural	574	1.3	746	10	5,740	300	172,200
B - Business	101	2.1	212	22	2,222	200	20,200
COM/PROF - Commercial - Professional Office	1	2.1	2	22	22	200	200
I - Industry	38	1.5	57	16	608	200	7,600
R3 - Residential	52	1.4	73	15	780	140	7,280
R4 - Residential	1,252	1.4	1,753	15	18,780	140	175,280
TOTALS	2,018		2,843		28,152		382,760
02040105090020							
B - Business	164	2.1	344	22	3,608	200	32,800
B/IL/WT - Business/Light Industrial - Warehousing Terminal	65	1.5	98	16	1,040	200	13,000
COM/PROF - Commercial - Professional Office	91	2.1	191	22	2,002	200	18,200
OR - Office - Research	157	2.1	330	22	3,454	200	31,400
R 1/2 - Residential Village	22	1.4	31	15	330	140	3,080
R-1 - Medium Density Residential	36	1.4	50	15	540	140	5,040
R3 - Residential	2,133	1.4	2,986	15	31,995	140	298,620
R4 - Residential	201	1.4	281	15	3,015	140	28,140
TOTALS	2,869		4,312		45,984		430,280
02040105070060							
AR - Special Agricultural	127	1.3	165	10	1,270	300	38,100
IL - Light Industry	35	1.5	53	16	560	200	7,000
R4 - Residential	45	1.4	63	15	675	140	6,300
TOTALS	207		281		2,505		51,400

INDEPENDENCE TOWNSHIP
BUILD-OUT and POLLUTANT
LOAD IMPACT

02040105160010							
B - Business	143	2.1	300	22	3,146	200	28,800
PRD-4 - Planned Residential Development	18	1.4	25	15	270	140	2,520
PRD-IH - Planned Residential Development - Inclusionary Housing	48	1.4	67	15	720	140	6,720
R-2 - Low Density Residential	11	0.6	7	5	55	100	1,100
R3 - Residential	779	1.4	1,091	15	11,685	140	109,060
R4 - Residential	290	1.4	406	15	4,350	140	40,600
TOTALS	1,289		1,896		20,226		188,600
02040105150100							
B - Business	86	2.1	181	22	1,892	200	17,200
IL - Light Industry	22	1.5	33	16	352	200	4,400
R-1- Medium Density Residential	21	1.4	29	15	315	140	2,940
R3 - Residential	505	1.4	707	15	7,575	140	70,700
R-M - High Density Residential	41	1.4	57	15	615	140	5,740
PRD-4 - Planned Residential Development	10	1.4	14	15	150	140	1,400
PRD-SC - Planned Residential Development - Senior	66	1.4	92	15	990	140	9,240
PSCRD - Planned Senior Citizen Residential Development	34	1.4	48	15	510	140	4,780
TOTALS	785		1,161		12,399		116,380
02040105080020							
AR - Special Agricultural	84	1.3	109	10	840	300	25,200
TOTALS	84		109		840		25,200
02040105090030							
I - Industry	144	1.5	216	16	2,304	200	28,800
R3 - Residential	262	1.4	367	15	3,930	140	36,680
R4 - Residential	5	1.4	7	15	75	140	700
TOTALS	411		590		6,309		66,180

INDEPENDENCE TOWNSHIP
BUILD-OUT and POLLUTANT
LOAD IMPACT

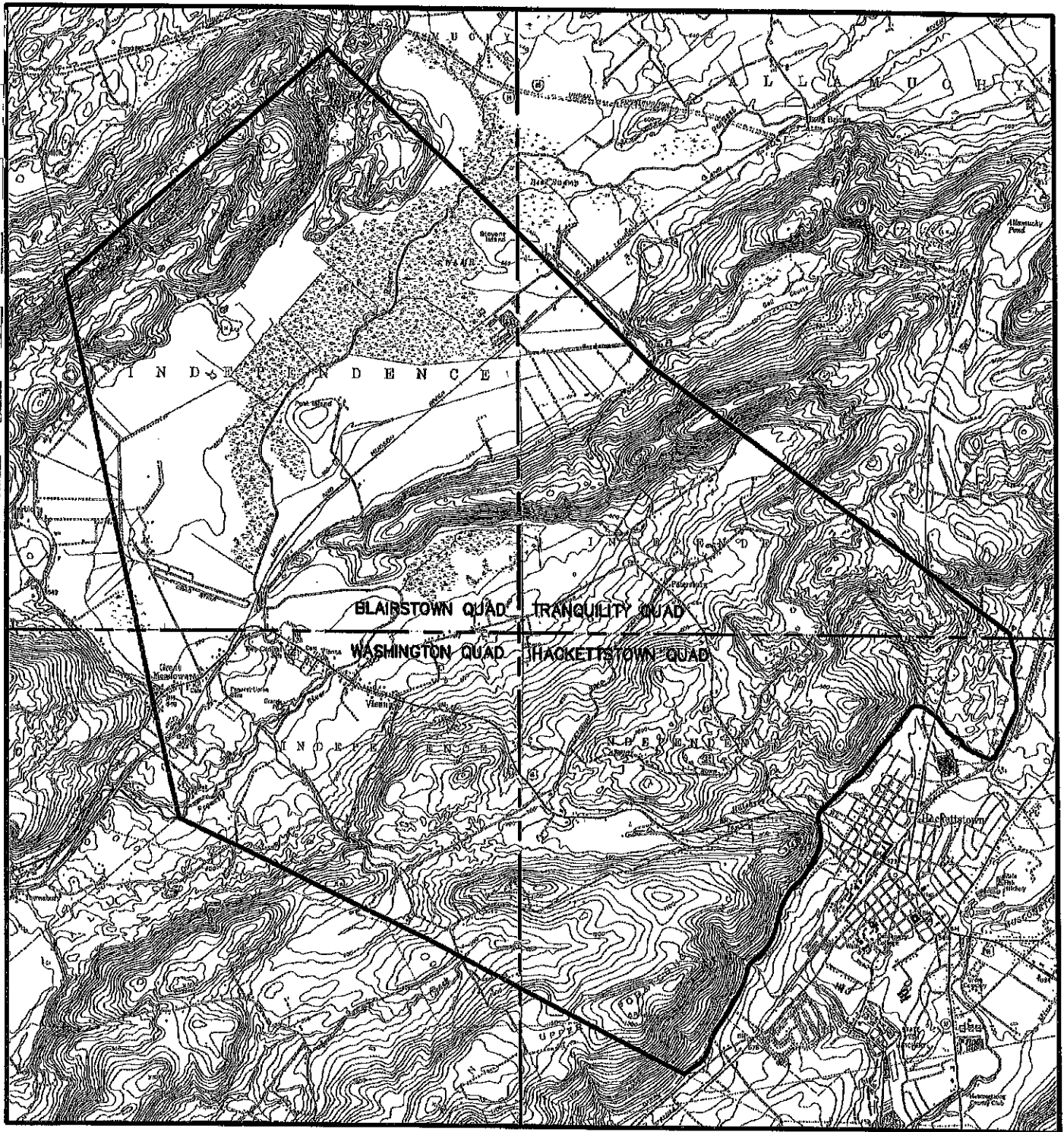
02040105100010							
AR - Special Agricultural	1	1.3	1	10	10	300	300
R4 - Residential	397	1.4	556	15	5,955	140	55,580
TOTALS	398		557		5,965		55,880
02040105140010							
R3 - Residential	167	1.4	234	15	2,505	140	23,380
R4 - Residential	177	1.4	248	15	2,655	140	24,780
TOTALS	344		482		5,160		48,160
TOTAL ALL HUCs	8,405		12,230		127,540		1,364,840

APPENDIX

WATERWAYS OF INDEPENDENCE TWP.
(REF. FIGURE 2)



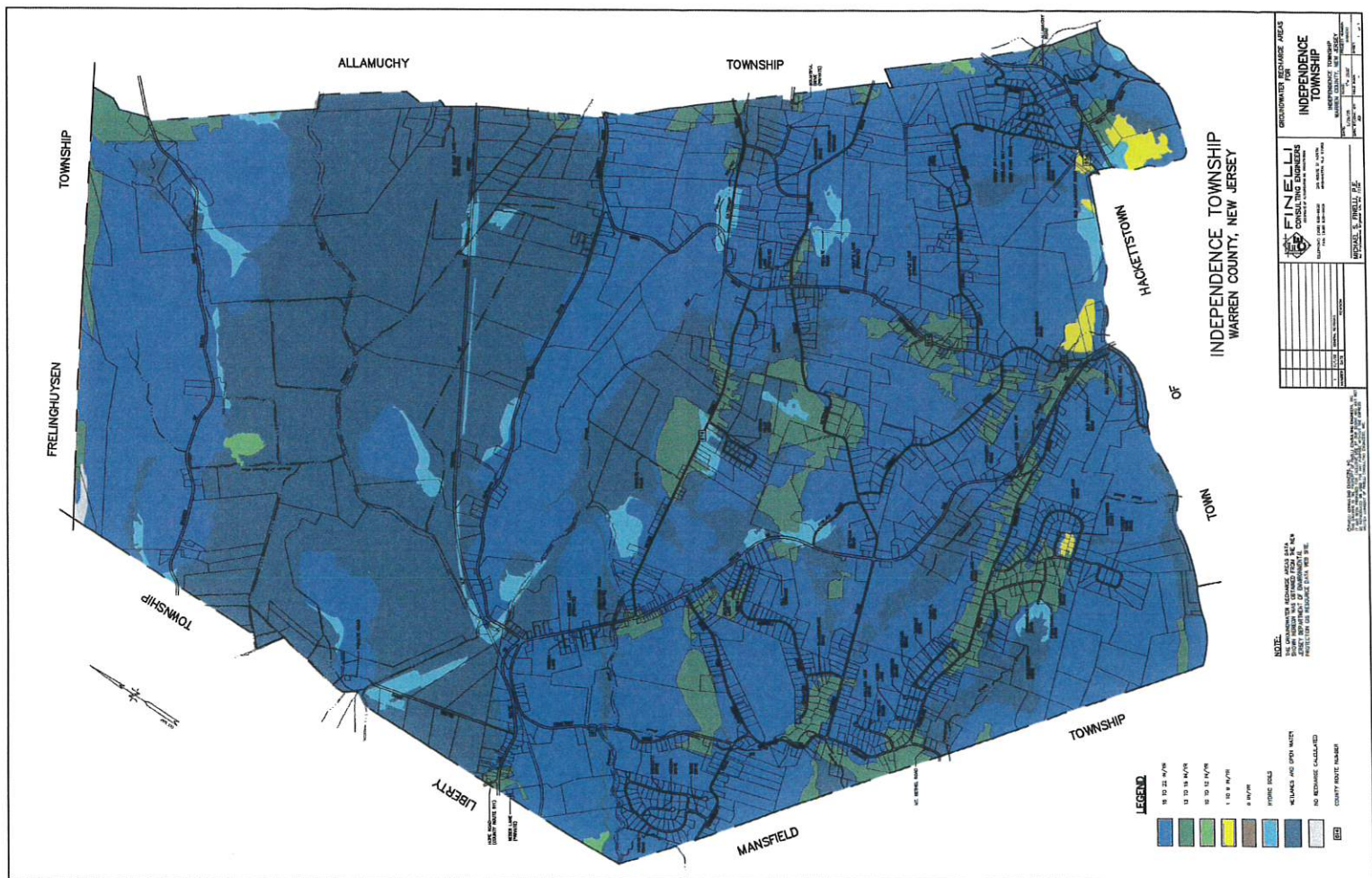
***USGS QUADRANGLE MAP FOR
INDEPENDENCE TWP.
(REF. FIGURE 3)***



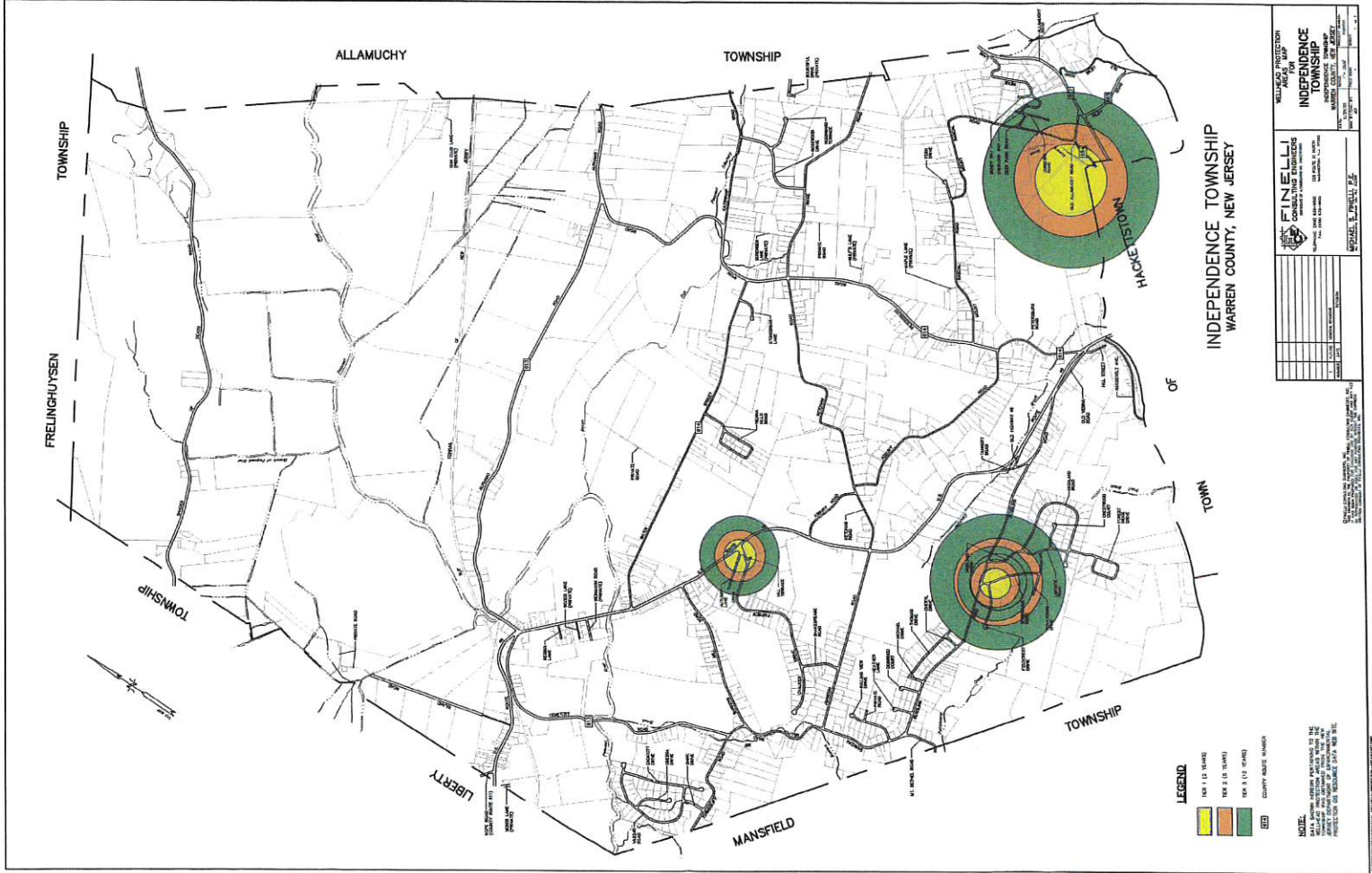
USGS QUADRANGLE MAP
FOR
INDEPENDENCE TOWNSHIP

WARREN COUNTY, NEW JERSEY
NOT TO SCALE

***GROUNDWATER RECHARGE AREAS
FOR INDEPENDENCE TWP.
(REF. FIGURE 4)***

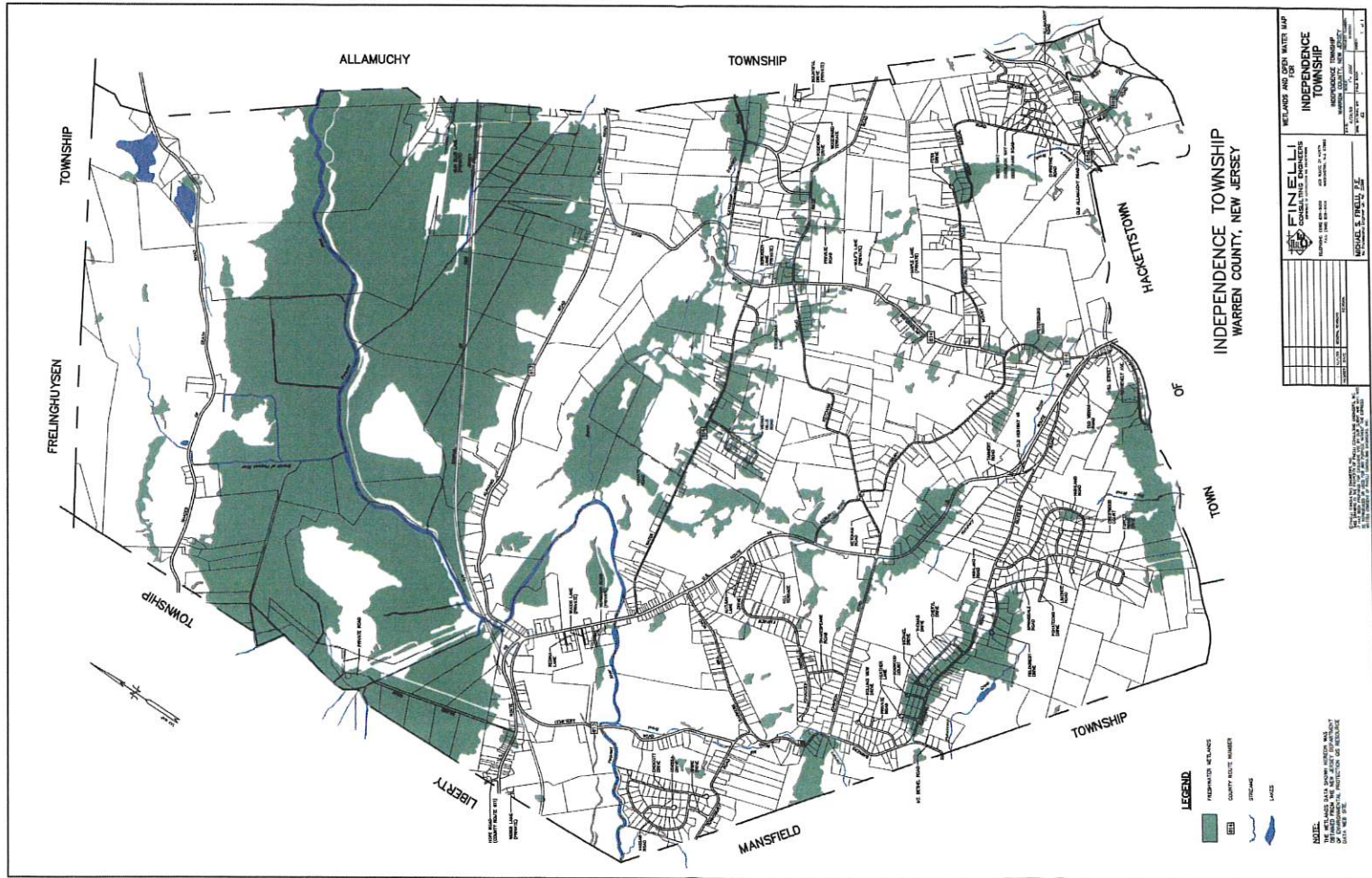


***WELLHEAD PROTECTION AREAS FOR
INDEPENDENCE TWP.
(REF. FIGURE 5)***



FINELLI CONSULTING ENGINEERS 1000 ROUTE 100 SUITE 100 HAZARD STUDY 1000 ROUTE 100 SUITE 100 HAZARD STUDY		PROJECT NO. 1000 DATE 10/1/10 SCALE 1"=100' SHEET NO. 1 OF 1
PROJECT NO. 1000 DATE 10/1/10 SCALE 1"=100' SHEET NO. 1 OF 1		PROJECT NO. 1000 DATE 10/1/10 SCALE 1"=100' SHEET NO. 1 OF 1

***WETLANDS AND OPEN WATER MAP
FOR INDEPENDENCE TWP.
(REF. FIGURE 6)***



***HYDROLOGIC UNITS (HUC 14)
FOR INDEPENDENCE TWP.
(REF. FIGURE 7)***
