



Millstone River Flooding Old Kingston Bridge at Kingston Mill (looking upstream toward Carnegie Lake from “new” Route 27 Bridge) on September 17, 1999

## **Flood Mitigation Plan**

### **Township of Princeton**

**Mercer County, New Jersey**

**January 2006**

**Prepared with assistance from  
USDA Natural Resources Conservation Service  
220 Davidson Avenue, 4<sup>th</sup> Floor  
Somerset, NJ 08873  
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January 2006

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Also, I would like to acknowledge Clark Gilman of the New Jersey Department of Environmental Protection Flood Plain Management section for his recommendations for changes to the Township Flood Damage Prevention ordinance.

I would also like to acknowledge the over 130 residents who participated in the property owner survey.

Gregory J. Westfall  
Water Resource Planner

## Preface

### Setting

The Township of Princeton is located in the northern part of Mercer County, near Trenton, in north-central New Jersey. It is bordered by Franklin, Montgomery and South Brunswick Townships on the north, Plainsboro and West Windsor Townships to the east, Lawrence Township to the south and Hopewell Township to the west. (Figure 1). Historic and projected Township population is shown below:

Year	1960	1970	1980	1990	2000	2020
Population	10,411	13,651	13,683	13,198	16,027	17,350

Source: US Bureau of Census (Actual Population)  
Delaware Valley Regional Planning Commission (Projected Population)

Major routes include U.S. Route 206 which runs in a north-south direction through the Township. State Route 27 runs from the Borough of Princeton to the northeast corner of the Township. Other major roads include Princeton Pike, The Great Road, Mount Lucas Road, River Road, Harrison Street and Washington Road.

Stony Brook, Carnegie Lake and Millstone River form the eastern corporate limits of Princeton Township. Nearly the entire Township drains into the Millstone River watershed. Major tributaries to the Millstone River include Harrys Brook, Stony Brook, Mountain Brook and Van Horn Brook (Figure 2).

The topography of Princeton varies from approximately 400 feet above sea level in the western part of the Township to approximately 40 feet along the Millstone River in the northeastern part of the Township. The Township consists of gently rolling hills with flat floodplains (up to 2000 feet wide), along the Millstone and Raritan Rivers. The average annual precipitation in Princeton is approximately 45 inches.

There are several areas of the Township which lie in areas designated as flood plain. These areas are where repetitive flood losses have occurred. Repetitive flood losses are defined as those structures, which participate in the National Flood Insurance Program, which that have made damage claims under two or more flood events.

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Figure 1 – Princeton Township Location Map

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Figure 2 – NJDEP Subwatersheds Map

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## **Section A - Community Organization**

Princeton Township applied for a grant from the State Office of Emergency Management (OEM) to develop this Flood Mitigation Plan on May 13, 2003. The Township was notified by the State OEM on or about July 10, 2003 that it had been awarded the grant. The Princeton Township Council next approved a resolution that resulted in a December 23, 2003 agreement authorizing the USDA Natural Resources Conservation Service (NRCS) to develop this Flood Mitigation Plan (FMP). The Flood Control Committee was organized by the Princeton Township Council on November 15, 1971 and is the committee providing local input to the FMP. The following people are members of the Princeton Township Flood Control Committee:

Richard K. Olsson, Chair - Princeton Township Property Owner  
Karen Hegener, Princeton Township Committee Liaison (2004)  
Environmental Commission Liaison (2005)  
William Enslin, Princeton Township Committee Liaison (2005)  
May Papastephanou – Princeton Township Property Owner  
Michael A. Celia – Princeton Township Property Owner  
Tom Golobish, Princeton Township Property Owner (2005)  
Alvin Gordon, Princeton Township Property Owner (2004)  
Douglas Schleifer – Environmental Commission Liaison (2004)  
Robert V. Kiser - Princeton Township Engineer

Additional support to the Flood Control Committee was provided by the following:  
Theodore Cashel – Fire Official/Emergency Management Coordinator  
Robert Buchanan – Lieutenant, Police Department and Assistant Emergency Management Coordinator  
Lee O. Solow – Planner, Princeton Regional Planning Board  
Joseph J. Skupien – Stormwater Management Consulting, LLC.

This plan was prepared with the assistance of Gregory J. Westfall, Water Resource Planner, with the USDA Natural Resources Conservation Service.

## **Section B - Public Involvement**

### **Initial Public Meeting**

A public meeting was held on March 25, 2004 at the Princeton Township Municipal Building. The purpose of this meeting was to notify the local residents of the intention to prepare a Flood Mitigation Plan and to seek public input for flood problems and possible solutions. A copy of the public meeting minutes appears in the Appendix.

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## **Public Meeting on Draft Plan**

A second public meeting was held on January 24, 2005 at the Princeton Township Municipal Building. The purpose of this meeting was to discuss the draft Flood Mitigation Plan. Comments were received from the Township Committee and the public and were incorporated into the Plan.

## **Public Information Activities**

Princeton Township distributed in their Township newsletter a notice of their intent to prepare the Flood Mitigation Plan and a request for input from Township residents and property owners.

The Township also notified the residents of both of the initial and draft plan public meetings to discuss flooding and the preparation of the Flood Mitigation Plan.

## **Questionnaires**

In addition, the Township distributed a questionnaire to all Township residents known to be in the flood prone areas of the Harrys Brook, Mountain Brook and Stony Brooks. A total of 400 surveys were mailed to property owners in or adjacent to the floodplain. A total of 133 responses were received. Period of property ownership ranged from less than one year to over 46 years. A review of the responses indicated that seventy one of the respondents have had flood damages. Flood damages reported ranged from less than \$100 to over \$120,000 for twenty-nine respondents. A copy of the questionnaire and the summary of the results is in the Appendix.

## **Solicitation of Comments**

As described above, comments were solicited from the general public at the Initial Public Meeting on March 25, 2004 and at the Draft Plan Public Meeting on January 24, 2005.

## **Planning Process, Planning Committee Meetings**

The Princeton Township Flood Control Committee met on January 8, 2004, January 26, 2004, March 24, 2004, June 30, 2004, November 15, 2004, December 8, 2004 and January 19, 2005 to develop and review the Flood Mitigation Plan. A copy of the minutes for each of these meetings is in the Appendix.

## **Section C - Coordination with Other Agencies**

### **Initial Contact with Agencies, Comments**

Prior to the start of planning, the Township was in contact with the State of New Jersey Office of Emergency Management and the New Jersey Department of Environmental Protection. At the start of the planning process, a letter (See Appendix) was sent to several municipalities and state and county agencies, notifying them of the Township's intent to develop a flood mitigation plan. Contacted agencies were:

Delaware and Raritan Canal Commission  
FEMA Region II  
Franklin Township  
Hopewell Township Montgomery Township  
County of Mercer, Greg Sandusky, County Engineer  
South Brunswick Township  
Lawrence Township  
Mercer County Soil Conservation District  
NJDEP, Flood Plain Management Section  
NJDEP, Historic Preservation Office  
NJ State Police, State Office of Emergency Management  
NJ Water Supply Authority  
Plainsboro Township  
West Windsor Township

There was one comment (see Appendix) received from New Jersey Department of Environmental Protection Flood Plain Management Section.

### **Meetings with Agencies**

In addition to the initial contacts described above, it is important to note that many of these municipalities, counties and state agencies are also members of the Millstone River Watershed Steering Committee. This Committee formed in February 2000 as a result of resolutions of support from five counties including Hunterdon, Mercer, Middlesex, Monmouth and Somerset Counties and 12 of the 26 watershed municipalities including Princeton Township. The resolutions of support were approved for the development of a PL-566 (Watershed Protection and Flood Prevention) Plan. In June of 2000 the Committee identified seven goals and objectives for development of a watershed plan to address watershed concerns. Flood mitigation is the primary objective. Many other organizations and agencies participate in Steering Committee activities including the New Jersey Department of Environmental Protection, New Jersey Water Supply Authority, Federal Emergency Management Agency, Corps of Engineers and USDA Natural Resources Conservation Service. As a result, Princeton Township was also able to notify, correspond, and coordinate the Flood Mitigation Plan with these other entities through the Millstone River Watershed Steering Committee.

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There was one comment from other agencies or the seven neighboring municipalities at the beginning of the planning process. None of these groups attended either public hearing.

### **Review of Community Needs, Goals, Plans for the Area**

There are several plans, done by both private and public entities, which could influence development and redevelopment in the flood plain in Princeton Township. Selected Master Plan goals include:

Preserve, protect and enhance natural, cultural and recreational resources including open space linkages, steep slopes, floodplains, historic & cultural resources and recreational and open space areas.

Develop a regional master plan for drainage to address flooding in built-up areas as well as to ensure that Lake Carnegie is protected from polluted storm water run-off.

### **Agencies' Comments on Draft Action Plan**

No comments were known to have been received by neighboring municipalities or agencies.

## **Section D – Assessing the Hazard**

### **Background Information: Record of Past Floods**

Records of historical floods prior to 1933 on Stony Brook and the Millstone River immediately above Carnegie Lake are very sparse. The Geological Survey of New Jersey on Water Supply for 1896, and the Annual Reports of the State Geologist for the years 1896 and 1903 list the largest floods in the Raritan River basin as having occurred in 1810, 1865, 1882, 1896, and 1903. These floods were not referenced to a recoverable datum, but the flood of 1882 was reported as the largest up to 1903 on the Millstone River. The peak stage of September 17, 1934, was the greatest to 1966 on the Millstone River above Carnegie Lake; however, its magnitude was impacted considerably by several dam failures at headwater sites. The greatest flood during the period of record to 1966 at Lake Carnegie at Princeton and at Millstone River at Kingston occurred September 21, 1938. This 1938 flood may have been equaled or exceeded several times since the colonial period (Bettendorf, 1966).

However, since the 1938 flood, successively greater floods have occurred on August 28, 1971 (Hurricane Doria) and September 17, 1999 (Hurricane Floyd). Significant flooding also occurred on July 14, 1975.

Table 1 identifies the historic gaging stations in the Princeton Township vicinity. It should be noted that none of these gaging station locations are still in operation.

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Table 1 – Waterway Gaging Stations in the Princeton Township Vicinity

Gaging Station	Datum of Gage Above Mean Sea Level	Period of Record
Stony Brook at Princeton	62.23	October 1953 to September 1965
Millstone River at Plainsboro	53.41	May 1964 to September 1965
Lake Carnegie at Princeton	*50.00	October and November 1924, May 1925, and January 1926 to September 1965
Millstone River near Kingston	38.00	May 1933 to September 1949

\*Prior to October 1, 1950, datum 2.56 feet higher

Source: U.S.Geological Survey Water Resources Division, West Trenton, New Jersey

## FEMA Flood Insurance Study

The following information is abstracted from the June 4, 1984 FEMA Flood Insurance Study (FIS) report for Princeton Township:

*Low-lying areas along Stony Brook and Harrys Brook are subject to flooding. These streams drain hilly areas of relatively impervious soils. These conditions result in rapid runoff into Stony Brook and Harrys Brook. Some major floods, along with their discharges (in cubic feet per second – cfs) and recurrence intervals are listed in Table 2. Tables 3 and 4 show the peak discharges for various recurrence intervals.*

Table 2 - Major Floods and Their Recurrence Interval

Location	Date	Discharge (cfs)	Recurrence Interval (Years)
Millstone River at Blackwells Mills	September 21, 1938	18,300	50
	January 10, 1964	3,800	1+/-
	August 28, 1971*	22,200	100
	July 15, 1975	17,100	40
Stony Brook at Princeton	January 9, 1964	3,340	2
	August 28, 1971*	8,960	100
	July 14, 1975	4,980	5

\*Flood of record

Source: FEMA. June 4, 1984. Flood Insurance Study for Township of Princeton, New Jersey.

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Table 3 - Summary of Discharges

Flooding Source and Location	Drainage Area (Sq. Miles)	Peak Discharges (cfs)			
		10-Year	50-Year	100-Year	500-Year
<b>Millstone River</b>					
At downstream corporate limits	170.02	7,330	11,355	13,545	19,420
At confluence with Harrys Brook	99.0	4,885	7,570	9,030	12,950
Above confluence with Stony Brook	81.8	4,230	6,555	7,820	11,215
<b>Stony Brook</b>					
At confluence with Millstone River	58.7	6,220	8,930	10,200	13,900
Above confluence with Duck Pond Run	55.7	6,050	8,690	10,010	13,530
Above confluence with Mountain Brook	44.5	5,410	7,770	8,950	12,100
At upstream corporate limits	38.6	5,040	7,230	8,330	11,260
<b>Mountain Brook</b>					
At confluence with Stony Brook	3.1	895	1,400	1,660	2,490
Upstream of tributary to Mountain Brook	2.7	765	1,215	1,480	2,190
<b>Mountain Brook Branch 2</b>					
At confluence with Mountain Brook	1.0	440	665	755	1,100
<b>Van Horn Brook</b>					
Above tributary to Van Horn Brook	1.05	290	500	630	880
<b>Cherry Run</b>					
At downstream corporate limits	0.72	240	355	425	570
Tributary to Van Horn Brook					
At confluence with Van Horn Brook	0.47	115	165	200	270

Source: Federal Emergency Management Agency. June 4, 1984. Flood Insurance Study for Township of Princeton, New Jersey. 33pp. plus maps.

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Table 4 - Summary of Discharges for Harrys Brook

<b>Harrys Brook</b>					
At confluence with Millstone River	15.4	850	1,330	1,610	2,350
Above confluence with Branch 2, Harrys Brook	0.89	325	580	735	1,150
At Snowden Lane	0.55	280	500	635	950
<b>Harrys Brook Branch 1</b>					
At confluence with Harrys Brook	0.25	80	120	145	200
<b>Harrys Brook Branch 2</b>					
At confluence with Harrys Brook	1.5	540	860	1,050	1,560
<b>Harrys Brook Branch 2-1</b>					
At confluence with Harrys Brook	0.46	110	165	200	280
<b>Harrys Brook Branch 2-2</b>					
At confluence with Harrys Brook	0.20	140	210	245	330

Source: Federal Emergency Management Agency. June 4, 1984. Flood Insurance Study for Township of Princeton, New Jersey. 33pp. plus maps.

Figures 3, 4, 5, 6 and 7 show the damage costs, frequency and location of flood damages relative to the major watersheds (Harrys Brook, Mountain Brook, Stony Brook and Van Horn Brook and the Carnegie Lake vicinity) within the Township. Data for these figures came from the Property Owner Survey Questionnaire and the Federal Emergency Management Agency (FEMA) National Flood Insurance Program Flood Claims database.

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Figure 3 – Owner Survey Flood Damage Costs

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Figure 4 – FEMA Flood Claims Content Damage Costs

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Figure 5 – FEMA Flood Claims Structure Damage Costs

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Figure 6 – FEMA NFIP Flood Claim Frequency

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## **Flood Prone Areas**

The flood prone areas of Princeton Township are shown in Figure 7.

Figure 7 – Flood Damage Locations and FEMA Flood Zone  
Data Sources: FEMA. June 4, 1984. Flood Insurance Study for Princeton Township,  
N.J. NJDEP. 2001. GIS Resource Data

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## **Description of Other Natural Hazards**

Streambank erosion, due to stream velocity and volume, is a significant hazard to public and private properties within the Township. Based on the Property Owner Survey results, a number of private and public properties are affected by this hazard as a result of changes in upstream land use and associated imperviousness, weather patterns, changing a stream's cross-sectional area as a result of unnecessary filling and other factors. Geologic erosion is an ongoing process as streams and rivers mature, however, the process can be accelerated and exacerbated due to the above factors. Streambank and channel erosion are causing the loss of previously maintainable yards and lawns. In at least one case, a severe precipitation event or combination of events could cause major private property damage to a residential structure and contents if not treated. Figure 8 shows the location of reported streambank erosion within the Township.

Figure 8 – Owner Survey Streambank Erosion and Yard Flooding

Data Source: Princeton Township Property Owner Survey Results, March 2004.

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## **Section E – Assessing the Problem**

### **Repetitive Flood Losses**

Repetitive flood losses are those where two or more National Flood Insurance Program claims have been made for the same property during the 1977-2003 period. By this strict definition, there are two structures in the Harrys Brook watershed that have been identified as having repetitive losses. The specific location of structures is private information and on file. There may be other structures which have had repeated flood losses but may not have had flood insurance and so are not recorded in the database of National Flood Insurance Program claims.

### **Affected Structures, Public Health and Safety**

The Natural Resources Conservation Service surveyed the first floor, low opening and adjacent ground elevations for 10 residential properties in the Randall Drive and Meadowbrook Lane on Branch 2 of Harrys Brook as well as 5 residential properties on Locust Lane on the main stem of Harrys Brook. They had been identified for further study as part of the NRCS Millstone River Watershed Flood Damage and Mitigation Analysis Study done under the PL83-566 program.

Table 5 presents a summary of the number and types of property that are vulnerable to flooding as defined by the 500, 100, 50, 10 and 2 year flood events under the flood depths as determined for Harrys Brook Branch 2 (FEMA FIS, 1984). Table 6 presents a summary of the number and types of property that are vulnerable to flooding as defined by the 500, 100, 50, 10 and 2 year flood events under the flood depths determined for Harrys Brook mainstem (FEMA FIS, 1984).

Comparing the elevations of the first floors and low openings (basement doors or windows) of the 10 homes in the Branch 2 vicinity (Meadowbrook and Braeburn) to the projected elevation of 5 different flood frequencies gave a good indication of their vulnerability to flooding. Table 5 below displays this information. In summary, 2 of the 10 homes studied were very flood prone in that they sustained flood damage that was frequent and substantial. Six of the remaining 8 homes were damaged less frequently, and two were not flooded. Not coincidentally, one of the 2 homes found to be the most flood prone was that which has the most flood insurance claims in the FEMA database.

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It should be pointed out that there are a significant number of structures which have been and continue to be affected by historic flooding throughout the Township but are not considered to be repetitive flood losses. These properties may not be considered to be repetitive flood loss properties for several reasons including:

1. Previous owner did not carry flood insurance
2. Previous flooding occurred prior to the existence of the National Flood Insurance Program

These properties occur adjacent to Harrys Brook, Stony Brook, Carnegie Lake and Mountain Brook. The historic flood loss areas are shown in Figure 5.

Similarly, the elevations of the first floor and low openings were compared with the 5 different flood for five homes in the Harrys Brook mainstem vicinity (Locust Lane). There was no structure which was identified as having first floor flooding, however, up to three structures, one of them under nearly every flood frequency, can have flood waters moving into their basements.

Floods have a great impact on public health. For example, during Hurricane Floyd flooding, the public drinking water supply was in question due to a lack of water pressure and the possibility for bacterial contamination. The Township Health Department worked closely with the public water system to ensure potable water for the residents. People on well water can be affected if flood waters rise over the top of well heads. It is possible for bacterial contamination to occur in wells. One possible source of this contaminant could be caused by flooded septic systems that are not designed to operate in a completely saturated state. In addition, sewage backups from municipal sewer pipes can be a problem for homeowners. The rescue of pets and other wildlife issues must also be addressed during a flood. Finally, flooding of homes can cause mold growth. Although rare, deadly mold can also grow in flooded homes. During a flood situation, the above items are just a few of the situations where public health departments must respond to the public's concerns (Henry, 2005).

An economic analysis was done to compute the average annual flood damages for the 10 homes in Harrys Brook Branch 2. While in some cases the projected damages were significant, the small number of homes affected precluded further analysis as a PL83-566 Project.

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Table 5 – Summary of Number of Flood Vulnerable Residential Properties in Harrys Brook (Meadowbrook Road) Vicinity

Flooding Location within Structure	Flood Frequency				
	2 Year (50%)	10 Year (10%)	50 Year (2%)	100 Year (1%)	500 Year (0.2%)
First Floor	1	2	2	3	4
Low Opening/ Basement	1	3	3	4	4

Note: For example a 2 year flood occurs (statistically speaking) every other year, and has a 50% (one in two) chance of occurring in any one year.

Data Sources: FEMA, 1984  
USDA NRCS Structure Elevation Survey

Table 6– Summary of Number of Flood Vulnerable Residential Properties in Harrys Brook (Locust Lane) Vicinity

Flooding Location within Structure	Flood Frequency				
	2 Year (50%)	10 Year (10%)	50 Year (2%)	100 Year (1%)	500 Year (0.2%)
First Floor	-	-	-	-	-
Low Opening/ Basement	-	1	1	1	3

Note: For example a 2 year flood occurs (statistically speaking) every other year, and has a 50% (one in two) chance of occurring in any one year.

Data Sources: FEMA, 1984  
USDA NRCS Structure Elevation Survey

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Photo 1 - Carnegie Lake Hurricane Floyd Flooding on September 17, 1999

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Photo 2 - Harrys Brook (Main Stem) Flooding on September 17, 1999

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Photo 3 - Harrys Brook (Main Stem) Flooding at Private Driveway Crossing on  
September 17, 1999

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Photo 4 - Harrys Brook (Main Stem) Flooding on September 17, 1999 at Residence

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Photo 5 - Millstone River Flooding at Princeton Church of Christ, Kingston  
on September 17, 1999

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Photo 6 - Millstone River Flooding at Kingston Locktender's House on D&R Canal on September 17, 1999

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Photo 7 - Stony Brook Flood Damage to Quaker Road on September 17, 1999

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Photo 8 - Stony Brook Flood Damage to Quaker Road on September 17, 1999

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Photo 9 - Harrys Brook Branch 2 Flood Mark on Meadowbrook Road Property

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Photo 10 – Harrison Street at Hamilton Avenue in Princeton Borough September 16, 1999

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Photo 11 - Stony Brook Streambank Erosion

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Photo 12 – Harrys Brook Branch 2 Streambank Erosion

## **Description and Impact of Flooding**

### **FEMA National Flood Insurance Program Damage Claims**

Princeton Township is estimated to have a 50 percent participation rate in the National Flood Insurance Program. The rate of participation was derived by dividing the number of policies in force by the number of residential and commercial structures reported as being located in the Special Flood Hazard Area (SFHA) of the municipality. As of 2004, Princeton Township had 74 insurance policies in force, representing \$18,859,900 in coverage (Rizzo, 2004). Since 1978, there have been 32 paid losses totaling \$391,381 in claims paid since 1978. The National Flood Insurance Program (NFIP) claims filed between 1978 and 1999 show that Princeton Township had the sixth highest dollars of flood damage claims filed in the 26 municipalities in the Millstone River watershed. There are two repetitive loss (two or more claims) structures in Princeton Township (Rizzo, 2004). These two structures account for nearly 32 percent of all paid flood losses for the 38 structures making claims from the Township.

### **Property Owner Survey Results**

Table 6 gives an indication of the flood damages as voluntarily reported by property owners who participated in the Property Owner Survey conducted in March 2004.

### **Flooding Impacts on Road Crossings**

Princeton Township reports that Quaker Road had eight road closures (Henderson, 2004) for up to two days due to flooding. Closures in 2003 occurred on 3/21, 6/4, 6/21, 10/29, 11/20, 12/11, 12/15 and 12/24. Quaker Road has an average annual daily traffic (AADT) of 9,151 vehicles per day (Carbone, 2004).

### **Critical Facilities in Plan Area**

Critical facilities are those facilities that are essential for community functions. These include schools, nursing homes, fire stations, sewer and water treatment facilities, post office and other essential structures. Figure 9 shows the location of these critical facilities and Table 7 lists these facilities.

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Table 7 – Property Owner Survey Reported Flood Damages

Watershed	Number of Properties Flooded	Dollars of Flood Damages		
		Range	Average	Total
Harrys Brook	15	\$500 – \$100,000	\$9,587	\$143,800
Lake Carnegie	3	\$3000 - \$150,000	\$60,333.	\$181,000
Mountain Brook	3	\$100 - \$120,000	\$40,867.	\$122,600
Stony Brook	7	\$100 - \$40,000	\$9,686.	\$67,800
Van Horn Brook	1			\$4,000
TOTALS	29			\$519,200

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Table 8 – Critical Facilities in Princeton Township

Type of Facility	Name of Facility	Location
Educational	American Boys Choir School	19 Lambert Drive
	Community Park School	373 Witherspoon Street
	Hun School	176 Edgerstoune Road
	John Witherspoon School	217 Walnut Lane
	Johnson Park School	285 Rosedale Road
	Littlebrook School	39 Magnolia Lane
	Princeton Academy	101 Drakes Corner Road
	Princeton Charter School	575 Ewing Street
	Princeton Day School	650 The Great Road
	Princeton Friends School	470 Quaker Road
	Princeton High School	Walnut Lane
	Riverside School	58 Riverside Drive
	Stuart County Day School	1200 Stuart Road
	Forbes College	Princeton University
	Princeton Nursery School	78 Leigh Avenue
	University League Nursery	171 Broadmead
	Crossroad Nursery School	220 Olden Lane
	YWCA Nursery School	25 Valley Road
	Cherry Hill Nursery School	50 Cherry Hill Road
	Princeton French School	All Saints Road
Nursing Care	Princeton House	805 Herrontown Lane
	Tenacre Foundation	930 Great Road
	Acorns Glen	775 Mount Lucas Road
	Princeton Nursery Home	728 Bunn Drive
	Princeton Medical Center	281 Witherspoon Street
	Princeton Medical Center Dialysis/Chemotherapy Center	419 N. Harrison Street
	Princeton Medical Center Surgical Center	727 State Road
Special Facilities	Home for Developmentally Disabled	16 Gulick Road
Senior Citizens Housing	Redding Circle	Mount Lucas Road
	Coventry Farms	The Great Road
	Princeton Community Village	Bunn Drive
Fire and First Aid Squad	Princeton First Aid Squad	Harrison Street
	Princeton Fire Station	Witherspoon Street
Sewer and Water	Stony Brook Regional Sewage Authority	River Road
	Elizabethtown Water Company Pumping Stations	Harrison Street West Drive
Other	Institute for Advanced Study	Springdale Road
Churches	Princeton Church of Christ	River Road
		Birch Avenue
	All Saints Episcopal Church	Terhune & Journeys End Road

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Figure 9 – Critical Facility Locations and FEMA Flood Zones

Download PDF of this figure at

[http://www.nj.nrcs.usda.gov/programs/watersheds/flood\\_mitigation\\_assistance.html](http://www.nj.nrcs.usda.gov/programs/watersheds/flood_mitigation_assistance.html)

## **Development, redevelopment, population trends, and possible future development and redevelopment in the floodplain, watershed and natural resource areas**

Princeton Township's population, according to the 2000 census, is 16,662 people. The Delaware Valley Regional Planning Commission, the Metropolitan Planning Organization for this area projects the Township's population to increase to 17,158 people by the year 2030. This represents a 496 person increase or approximately 4 percent over 30 years. Based upon this, the Princeton community does not anticipate a large amount of development, redevelopment or population increase in the future.

Development and redevelopment in the floodplain is limited by the Township's Floodway and Flood Hazard Areas ordinance which prohibits buildings or structures from being erected, altered or enlarged in the floodway or flood hazard area. Based upon this ordinance, we do not anticipate any increase in development or redevelopment in this area.

Development will occur within the watershed areas. Most of the vacant land in Princeton is currently zoned for large lot single family homes. The largest vacant tract of land is zoned for single family homes on 4 acre lots. Based upon this density the amount of new development should be minimal. The only area zoned for medium density development with vacant tracts of land is the Bunn Drive area where a mixture of residential and nonresidential development is anticipated over the next five to ten years. This area will result in fewer than 175 homes and approximately 75,000 square feet of nonresidential space.

Development in natural resource areas such as wetlands and steep slopes is restricted by either state or local zoning ordinances. It is anticipated that no significant development will occur in natural resource areas (Solow, 2005).

## **Beneficial Function Areas**

Princeton Township has many patches of natural areas which provide diverse benefits to the community, including recreation, habitat for wildlife, plant biodiversity, runoff reduction, and floodwater storage. Forested areas and wetlands in watersheds improve water quality by intercepting rain water and reducing runoff, storing floodwaters for slower release, storing and cycling nutrients, removing some pollutants, providing shade and more stable temperatures for aquatic organisms, and increasing biological diversity and organic food bases for downstream species communities.

Figure 10 displays significant wildlife habitat locations within Princeton Township. The GIS data in Figure 10 were obtained from the NJ DEP "Landscape Project" Version 2 dataset. The data combine information on rare species occurrences with land use/land

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cover classification to provide a tool for planning habitat protection strategies. Most of the important ecological functions tend to occur in the areas depicted on the map, although some smaller habitat patches may not have been captured because of the relatively large scale of the mapping process. The Landscape Project criteria apply a set of ratings to each habitat patch. These ratings range from 1 to 5, and indicate not only whether the patch is suitable for the types of wildlife species often found in that habitat, but also whether or not threatened or endangered species have been observed in that patch. Additional ratings points are given based upon whether a species is listed as state threatened, state endangered, federally threatened or federally endangered. For the purposes of this document, we aggregated all 5 classes to produce a “general” map of habitat suitability. More specific information can be obtained from the NJ DEP Landscape Project webpage: <http://www.state.nj.us/dep/fgw/ensp/landscape/>

The table below summarizes the approximate acreages in each of four habitat classes. Most areas classified as forested wetland wildlife habitat are also classified as forest wildlife habitat.

<b>Significant Habitat Type</b>	<b>Acres within Princeton Township</b>
Forest	5159
Forested Wetland	1165
Grassland	761
Emergent Wetland	151

There are relatively large patches of critical forested wetland habitat within the floodplain areas of Princeton Township. Forested wetlands comprise about 12 percent of the total land cover in the township. This is a significant percentage, especially within the highly urbanized landscape of central New Jersey. These areas are widely distributed within the township, and the patches are large enough to provide significant benefits to water quality within the community.

Grassland areas are a diminishing resource in New Jersey as many of our agricultural lands are being converted to residential areas. These areas provide unique ecological benefits, such as providing habitat for grassland-nesting birds, and habitat for invertebrates such as butterflies and dragonflies. These areas also help recharge ground water and contribute less runoff compared to developed areas.

Although there are only about 150 acres of critical emergent wetland habitat within Princeton Township, these areas are uniquely valuable in terms of the species of plants and wetland wildlife that they support.

Figure 11 shows riparian areas with wildlife corridors.

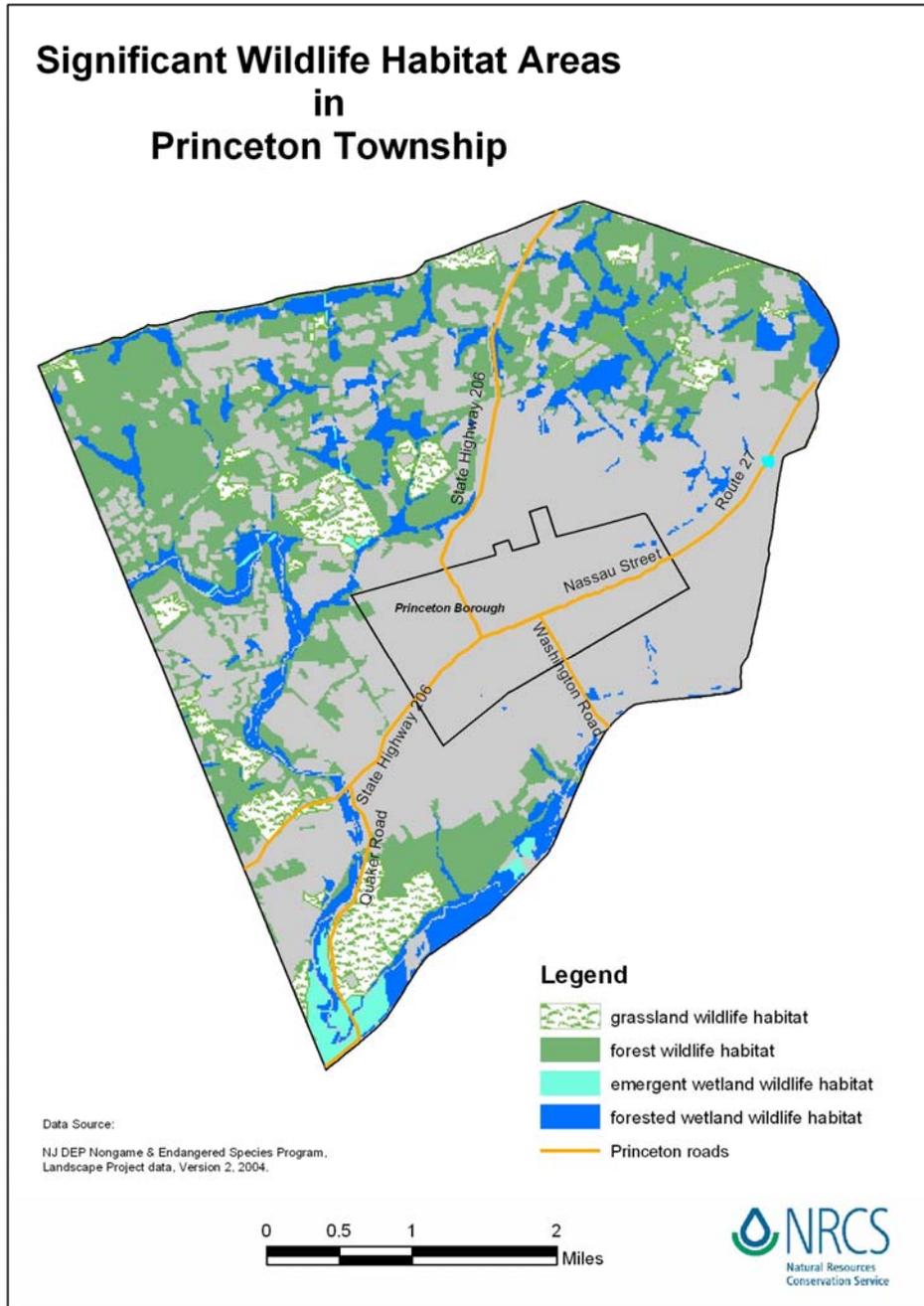


Figure 10 - Beneficial Functions

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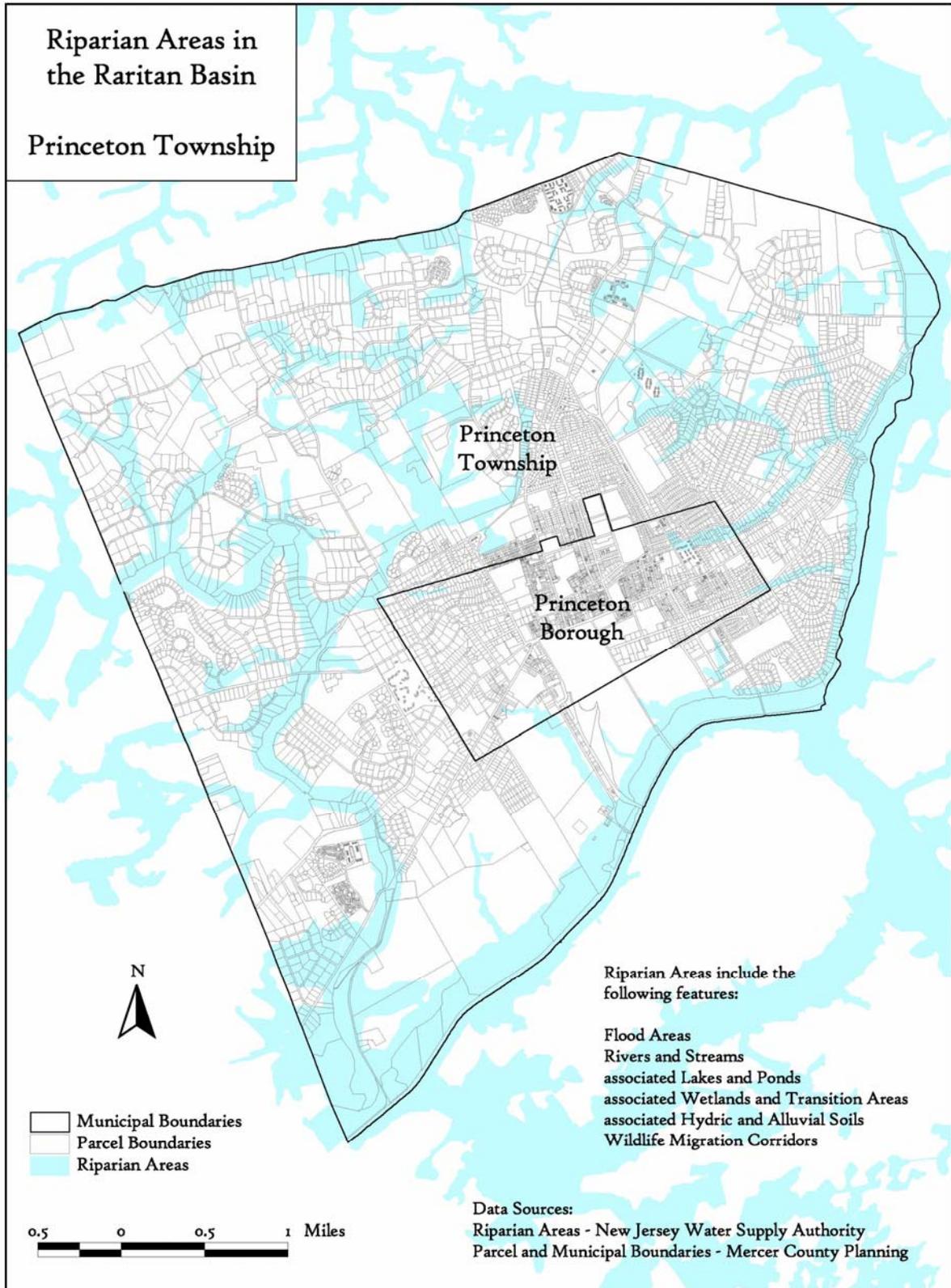


Figure 11 – Riparian Areas with Wildlife Corridors

## **Impact of Flooding**

The economic impact of flooding in Princeton Township has not been assessed previously. An economic assessment of Hurricane Floyd damages was done for New Jersey with specific references to Manville and Bound Brook (EDA/FEMA, 2000). However, a summary of the Preliminary Damage Assessment Report describing flood damages following Hurricane Floyd flooding is shown in the Appendix .

## **Procedures for Warning and Evacuating Residents and Visitors**

Warning and alert is done through the CAN system (Community Alert Network) that would automatically call residents and warns them of the problem and routes of evacuation. In addition local cable network and radio stations are used (Buchanan, 2005).

Evacuation would be handled by activating the Evacuation Annex of the Emergency Operations Plan which accounts for road closings. Pre-determined routes of evacuations and alternates are in place (Buchanan, 2005).

## **Existing Flood Protection Measures**

According to Bettendorf (1966), an approximately 2000 foot long dike varying in elevation from 64.5 to 68.4 feet in elevation (1929) exists between Port Mercer and Provinceline Road. This dike protects against relatively small floods of less than two year recurrence interval.

Also, Regional Detention Basin G was constructed by Princeton Township in 1988 to provide regional stormwater control for Van Horn Brook. (Skupien, 2004)

The Township has an ordinance (see the Appendix ) which restricts new development in flood plain areas in accordance with FEMA regulations (FEMA, 1984).

## **Section F – Set Goals**

The Princeton Township Flood Damage Prevention ordinance has the following goals:

- To protect human life and health
- To minimize expenditure of public money for costly flood control projects  
To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public
- To minimize prolonged business interruptions
- To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard
- To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas
- To insure that potential buyers are notified that property is in an area of special flood hazard
- To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

The Princeton Regional Planning Board's policy regarding stormwater control is as follows:

- Promote an integrated approach to regional stormwater management that addresses both water quantity and quality in the Township
- Design detention basins to fit into the natural terrain and preserve or reforest vegetation where appropriate in the Township
- Detention basins should be designed utilizing techniques which minimize disturbance and the size of the basin such as diversion of flow, compensation, and alternative quality measures.
- Control both storm water quantity and quality in the Borough where feasible.

The Board also supports the construction of regional stormwater detention basins where appropriate.

## **Section G – Review of Possible Activities**

Past and ongoing activities taken by the Township of Princeton have included the delineations of the flood plain and floodway along both Mountain Brook and Harrys Brook; the Harrys Brook Branch 2 Flood Control Feasibility Study and the Regional Stormwater Detention G installation upstream of Route 206 on Van Horn Brook. Future activities will include a focus on rehabilitation of existing dams, upgrading of enclosed drainage systems and retrofitting existing stormwater detention basins. Examples of these activities include rehabilitation of the Mountain Lakes and Smoyer

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Park dams for regional stormwater detention capability and dam safety; upgrading of the existing stormwater conveyance systems on Prospect and Jefferson Roads; and retrofitting an existing stormwater detention basin downstream of Bunn Drive.

Princeton Township will be developing a municipal Stormwater Management Plan in accordance with the NJDEP's Stormwater Management Rules (NJAC 7:8) as required by its NJDEP Municipal General Stormwater Discharge Permit.

Another on-going effort is a study to evaluate the impact on flooding and other concerns related to single residential lot redevelopment. The Residential Lot Redevelopment Study will investigate the potential downstream stormwater quantity impacts resulting from such redevelopment activities in the Township. Recently, there have been a number of residential lot redevelopment projects occurring in the Township. Such projects generally consist of either a major expansion of an existing residence or the demolition of the existing residence and its replacement by a considerably larger one. Since such redevelopment activities are presently not subject to the Township's stormwater management requirements, the Township is concerned about the potential for increased downstream flooding and erosion problems resulting from these activities. This type of activity increases the existing amount of impervious cover on the lot which, in turn, increases the peak rate and volume of stormwater runoff from the lot to downstream storm sewers and waterways. One of the primary goals of the Study will be to assist the Township in deciding whether it is prudent to impose stormwater management and/or other development restrictions on such activities in order to prevent adverse stormwater impacts from occurring downstream. Such increases threaten the success of the Township's longstanding stormwater management program for new development, which was implemented in 1975.

In addition, there are seven sediment control structures or small dams on the Stony Brook to reduce sedimentation of the Princeton University-owned Carnegie Lake. These dams have a degree of an impact on downstream flooding. State Dam Safety legislation requires that many existing dams must be rehabilitated or breached (removed) where the local sponsor is unwilling or unable to bring the dams up to current standards. A number of the dams currently have sponsors, responsible for operations and maintenance that are in this category.

Floodplain and open space preservation are discussed in the Princeton Community Master Plan. Both the Open Space and Recreation Element and Conservation Element have very specific recommendations (Solow, 2005)

Protection activities such as retrofitting, acquisition, and insurance are addressed in this Flood Mitigation Plan. Emergency services such as flood warning are discussed in the OEM plan (Buchanan, 2005). Princeton Township has a comprehensive flood warning system which includes public notification via cable network and radio as well as the CAN (Community Alert Network) (Buchanan, 2005).

Structural projects are addressed above.

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Public information activities include the public meetings at the beginning and end of the flood mitigation planning process as well as regular scheduled and publicly announced meetings of the long-standing Flood Control Committee and environmental education articles in the Township newsletter. Regular articles in the Township newsletter request phone number updates so that the public can be individually notified in the event of any danger (Buchanan, 2005)

## **Section H – Implementation of an Action Plan**

The Princeton Township Flood Control Committee recommends that Princeton Township implement the activities described below. A potential implementation schedule is shown in Table 10.

### **I. Road Flooding Safety**

#### **1. Establish Stony Brook waterway gage for Quaker Road flooding**

The Township, in cooperation with U.S. Geological Survey (USGS), should investigate utilizing the existing USGS gage on the Stony Brook at Route 206 to monitor and warn of flooding at Quaker Road. If use of the existing gage is impractical, the Township, in cooperation with the USGS, should install a new stream gage on Stony Brook at Quaker Road.

#### **2. Link Stream Gage output to Emergency Managers (Police and DPW)**

Once an appropriate monitoring gage location is selected, the Township should have real – time telemetry activated at the gage. This telemetry should transmit Stony Brook flood levels to the Township’s Emergency Management, Police and Public Works Departments so that, due to flooding, Quaker Road can be closed in a safe and timely manner.

#### **3. Install Appropriate Signage and Other Measures**

The Township should install appropriate signage linked warning motorists when Quaker Road is closed due to flooding. The Township should install signage following the “Turn Around Don’t Drown” NOAA campaign.

## **II. Public Participation**

### 1. Public Information

The Township should include information on its existing webpage and cable TV channel those residents of the threats of flooding and the benefits of flood insurance as well as provide links for weather and flood information, including flood conditions on Township roadways when information is available.

### 2. Community Rating System

The Township should review the available measures in the FEMA Community Rating System (see Appendix) and implement as many as practical in order to reduce flood insurance premiums paid by its residents.

## **III. Incorporation of Flood Mitigation Planning into Local Ordinances, Emergency Management Plan and Master Planning**

### 1. Revision of Flood Damage Prevention Ordinance

The Township should revise its existing Flood Damage Prevention Ordinance to incorporate the suggested recommendations (see Appendix) from the State Flood Plain Management Program.

### 2. Incorporation of Disaster Mitigation Planning in Master Plan

The Flood Mitigation Plan should be incorporated by reference into the Township Master Plan.

### 3. Incorporate Flood Overlay Zone into Township Zoning Ordinance

Identify and incorporate the FEMA Flood Insurance Study Flood Zone boundaries (and future amendments) as an overlay zone (using a similar approach to other overlay zones) in the Township Zoning ordinance. The Flood Zone overlay would add additional regulations to the underlying residential or commercial zoning.

### 4. Stormwater Management Ordinance for Land Development and Redevelopment Areas

The Township should require that land development and redevelopment projects as defined by the NJDEP Stormwater Management Rules (NNJAC7:8) comply with the Rule's groundwater recharge, erosion control and stormwater quality and quantity standards.

The Township should also evaluate and, where appropriate, implement findings of the Single Lot Redevelopment Study.

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5. Regional Cooperation and Coordination to Reduce Flooding Impacts

Since all stormwater runoff that originates in Princeton Borough must flow into Princeton Township, the Township and Borough should work cooperatively to address the flood impacts of land development and redevelopment. Such cooperative action can occur through the Regional Planning Board and joint Environmental Commission among other municipal departments, offices and agencies.

6. Regional Cooperation with Neighboring Municipalities and Princeton University To Maintain and Rehabilitate Aging Stony Brook Dams

The Township should proactively work to reduce the likelihood that, due to lack of maintenance and rehabilitation, one or more of the seven sediment control structures (small dams) that have some impact on downstream flooding, will be removed to meet State Dam Safety requirements.

7. Prioritize Riparian Areas for Open Space Acquisition and Conservation

The Township should make riparian areas a priority for open space acquisition and conservation easements.

8. Identification of Flood Emergency Technical and Financial Assistance Sources in Emergency Operations Plan

The Township should include sources of flood emergency technical and financial assistance (including the NRCS Emergency Watershed Protection Program) in its Emergency Response Plan. This program provides technical and financial assistance to municipalities for stream restoration and protection of roadways, bridges, and/or public/private structures in imminent jeopardy due to streambank erosion following a major flood or other natural disaster.

#### **IV. Private Property Flood and Stream bank Erosion Mitigation**

1. Develop stream bank erosion control information and permit assistance program

The Township should develop an information package on stream erosion for distribution to interested property owners. This package could contain sources of information on addressing stream erosion and required state permits and municipal approvals to do so. The Township should also assist the homeowners in the submission of required state permit applications prepared by homeowners and their professionals.

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2. Investigate physical features that may be increasing flood vulnerability

The Township should perform a hydraulic investigation of the low dam upstream of the Locust Lane crossing of the main stem Harrys Brook to determine its impact on the flood vulnerability of downstream residences, particularly those on Locust Lane adjoining Harrys Brook. Upon completion, the Township should transmit the results of this study to the affected property owners for their possible action.

3. Develop a log of property owner's survey comments

The Township will develop a log of property owners survey comments based on the results of property owner survey conducted earlier this year.

**V. Identify and Contact Funding Sources**

1. Flood Mitigation Measures at Repetitive Flood Loss Structures

Using the results of this Plan and, if there is sufficient property owner interest, seek funding from the N.J. Office of Emergency Management through the FEMA Flood Mitigation Assistance Program to address flood damages at repetitive flood loss structures as defined by FEMA.

2. Funding Applications to Other Agencies

When appropriate, The Township should apply for funding from the State Office of Emergency Management, Natural Resources Conservation Service, New Jersey Department of Environmental Protection Office of Environmental Services, and other agencies to implement appropriate aspects of this Plan.

3. Implement Long Term Funding Mechanism

The Township should consider investigating various means for the generation of the necessary funds for long-term implementation of needed stormwater management facilities and programs.

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Table 9 – Action Plan Timetable

Activity	Who	2005	2006	2007	2008	2009
<b>Road Flooding Safety</b>						
Establish Stony Brook waterway gage for Quaker Road Flooding	Township Engineer	X				
Link Stream Gage Output to Emergency Managers (Police & DPW)	Information Technology Person		X			
Install Electronic Warning Signage and other measures	Manager DPW		X			
<b>Public Participation</b>						
Public Information	Township Clerk	X	X	X	X	X
Community Rating System	Emergency Management Coordinator		X	X		
<b>Incorporation of Flood Mitigation Planning into Local Ordinances, Emergency Management Plan and Master Plan</b>						
Revision of Flood Damage Prevention Ordinance	Township Attorney	X	X			
Incorporation of Disaster Mitigation Planning in Master Plan	Planning Director			X		
Incorporate Flood Overlay Zone into Township Zoning Ordinance	Zoning Administrator	X	X			
Stormwater Management Ordinance for Redeveloped Residential and Commercial Areas	Township Attorney	X	X			
Regional Cooperation and Coordination to Reduce Flooding Impacts	Township Engineer	X	X	X	X	X
Regional Cooperation with Neighboring Municipalities and Princeton University To Maintain and Rehabilitate Aging Stony Brook Dams	Township Engineer	X	X	X	X	X
Prioritize Riparian Areas for Open Space Acquisition and Conservation	Planning Director	X	X			
Identification of Flood Emergency Technical and Financial Assistance Sources in Emergency Operations Plan	Emergency Management Coordinator	X	X	X	X	X
<b>Private Property Flood and Streambank Erosion Mitigation</b>						
Develop streambank erosion control information and permit assistance program	Township Engineer	X	X			
Investigate physical features that may be increasing flood vulnerability	Township Engineer with Consultant		X			
Develop a log of property owners survey comments	Admin. Assistant					
<b>Identify and Contact Funding Sources</b>						
Flood Mitigation Measures for Repetitive Loss Structures	Township Engineer	X	X	X		
Identify and Contact Funding Sources	Township Engineer	X	X	X	X	X
Implement Long Term Funding Mechanism	Township Engineer		X			

## **Section I – Plan Adoption**

This Flood Mitigation Plan was formally adopted by the Princeton Township Committee at its meeting on September 12, 2005. Formal certification by the Federal Emergency Management Agency occurred on December 21, 2005.

## **Section J – Plan Monitoring and Evaluation**

The Princeton Township Flood Control Committee shall meet in late 2005 following the acceptance of the Flood Mitigation Plan by FEMA. The Committee will prepare an annual report that identifies the successfulness of the plan as determined by the result of implementing the selected mitigation strategies outlined in the plan. For those strategies that have not been successful, mitigation measures will be analyzed and revised as necessary in accordance with the objectives of the plan. Furthermore, they shall monitor the implementation of the various recommendations including the Township Committee's pursuance of resolutions and preparation of public information documentation. Revisions to the Plan will be recommended based on actions which are successful.

In the future the Township may make an application for a reduction in their community flood insurance rating. Therefore the Township will endeavor to accomplish as much as possible to obtain as favorable a rating as possible.

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## Appendix

**Resolution Establishing the Princeton Township Flood Control  
Committee**

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RESOLUTION

(Adopted November 15, 1971)

BE IT RESOLVED by the Township Committee of the Township of Princeton:

1. There is hereby created a committee in and for the Township of Princeton to be known as Princeton Township Committee on Flood Control.

It shall have seven members, consisting of one member of the Princeton Township Committee appointed by the Township Committee, one member of the Princeton Township Conservation Commission appointed by the Commission, one employee of the Township Engineering Department appointed by the Township Engineer, and four citizens of the Township appointed by the Township Committee. The terms of office of the representatives of the Township Committee, the Conservation Commission and the Engineering Department shall be one year each, except that those representatives first appointed shall serve for terms ending January 1, 1973. The terms of the four citizens shall be four years each, except that of the citizens first appointed, one shall be for a term ending January 1, 1973, one for a term ending January 1, 1974, one for a term ending January 1, 1975 and one for a term ending January 1, 1976.

All members shall serve after the expiration of their terms until their successors have been appointed and shall qualify. Vacancies occurring other than by expiration of term shall be filled promptly by appointing authority but for the unexpired term only.

The members of the Princeton Township Committee on Flood Control shall serve without compensation but shall be reimbursed for their ordinary and necessary expenses in the performance of their duties provided such expenses shall have first been approved by the Township Committee and the amount thereof is within budgeted appropriations. The Committee may incur other expenses in carrying out its duties and purposes but only if such expenses shall first be approved by the Township Committee and the amount thereof is within budgeted appropriations.

The Princeton Township Committee on Flood Control shall be only an advisory, and not an executive, body, and, subject to this limitation, it shall have the following powers and duties:

- (a) To conduct investigations and studies and make recommendations to the Township Committee concerning flooding problems in the Township of Princeton and the solution or mitigation thereof.

To investigate and make recommendations to the Township Committee concerning avenues and methods of cooperation with, and the procurement of financial assistance from, other agencies, both private and governmental, that have an interest in flood control.

To organize by the appointment of a chairman from among its citizen members and to make and amend rules for its own government that are not contrary to law or to this Resolution.

To report to the Township Committee in writing as to its activities annually and at such other times as the flood control committee shall deem advisable or as the Township Committee shall request.

**Flood Control Committee Meeting Minutes**

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TOWNSHIP OF PRINCETON  
**FLOOD CONTROL COMMITTEE**  
**Minutes of Work Session**  
**Thursday, January 8, 2004 – 4:00 PM**  
**Municipal Complex, Meeting Room B**  
400 Witherspoon Street, Princeton, New Jersey

## 1. OPENING STATEMENT

The meeting was called to order at 4:15 PM with Ms. Ceballos reading the opening statement as required by the Open Public Meetings Act, acknowledging that the notice of the meeting was adequately published.

## 2. ROLL CALL

**PRESENT:** Dr. Richard Olsson, Chair, May Papastephanou, Alvin Gordon.

**ABSENT:** Michael A. Celia, Douglas Schleifer, Environmental Commission Member, Karen Hegener, Township Committee Liaison.

**ALSO PRESENT:** Robert V. Kiser, P.E., Township Engineer, Joseph Skupien, PE, PP, SWM Consulting, Greg Westfall, Water Resources Planner, USDA-NRCS, and Claudia Ceballos, Secretary.

There were no members of the public present.

## 3. BUSINESS

### **Background of Flood Mitigation Planning Grant**

Mr. Kiser introduced Mr. Greg Westfall, of the USDA-NRCS and advised that he will be preparing a flood mitigation plan for the Township, which will make the Township eligible for federal funds to reduce flood damages. The NRCS will review all aspects of flooding within the Township but will primarily focus on the Harry's Brook stream corridor where homes in the Meadow Brook area are known to flood during times of severe rain fall.

Mr. Skupien, recapped how this entire process started looking at branch two of Harry's Brook, the Lavid's house and few others, he did the previous study looking into structural measures to solve the flooding, including either channel improvements, bridge replacements or building a detention basin along Terhune but none of the alternatives from a structural stand point made any economic sense. The costs just did not seem to be anywhere near the benefits to be gained.

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After hurricane Floyd occurred, our State elected Officials contacted both the Natural Resources Conservation Center, part of the Department of Agriculture and the Corps of Engineers and asked for help in finding any federal program available.

The Natural Resources Conservation Service to date has completed plans for Manville, Bound Brook, and the Village of North Branch. They now are available to complete plans for Princeton Township and some of the surrounding communities.

**b) State OEM/FEMA Flood Mitigation Program Features**

Mr. Westfall explained that FEMA- Flood Mitigation Program primary goal is to reduce repetitive flood losses. Once the plan is certified FEMA pays 75% and the Township pays 25% of the cost to prepare the plan. The program in New Jersey includes about 30 municipalities out of 566 that have done flood mitigation plans. Once the plan is completed it gets reviewed by the State, by neighboring municipalities, and the Corp of Engineers.

**c) Flood Mitigation Planning**

The members watched a video produced by the Association of State Flood Plain Managers.

(Video lasted about 15 minutes)

**d) Flood Mitigation Plan Requirements**

A handout was distributed to all attending and a copy is attached hereto.

**e) Princeton Township Flood Mitigation Plan Map Needs**

A handout was distributed to all attending and a copy is attached hereto.

**f) Public Meeting Date and Time**

A public hearing should be schedule for sometime if February.

**g) Open Discussion**

The primary outcome of the Flood Control Committee meeting was to set a goal to identify property owners in various flood plains within the Township. It is anticipated that this can be accomplished prior to the next meeting. Once this has occurred, a survey questionnaire will be

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sent to each property owner. A sample survey questionnaire will be reviewed at the next meeting.

There was considerable discussion regarding the "mega-mansions" re-development issue in the Township. This involves the purchase of existing residential properties, demolition of the existing structure and the building of a new large residential structure with large amounts of new impervious areas. While adequate stormwater management controls have existed for many years for multiple lot subdivisions, The Township is considering the addition of impervious area cover limitations and other stormwater management controls for these type single lot redevelopments.

A copy of the Township Flood Plain ordinance and a copy of the Master Plan was given to Mr. Westfall at the meeting.

#### **4. ADJOURNMENT**

The meeting was adjourned at 5:30 PM.

Respectfully Submitted,

Claudia Ceballos, Secretary  
Princeton Township  
Flood Control Committee

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TOWNSHIP OF PRINCETON  
**FLOOD CONTROL COMMITTEE**  
**Minutes of Meeting**  
**Thursday, January 26, 2004 – 4:00 PM**  
**Municipal Complex, Meeting Room B**  
**400 Witherspoon Street, Princeton, New Jersey**

**1. OPENING STATEMENT**

The meeting was called to order at 4:15 PM with Ms. Ceballos reading the opening statement as required by the Open Public Meetings Act, acknowledging that the notice of the meeting was adequately published.

**2. ROLL CALL**

**PRESENT:** Dr. Richard Olsson, Chair, May Papastephanou, Alvin Gordon.

**ABSENT:** Michael A. Celia, Karen Hegener, Township Committee Liaison.

**ALSO PRESENT:** Robert V. Kiser, P.E., Township Engineer, Joseph Skupien, PE, PP, SWM Consulting, Greg Westfall, Water Resources Planner, USDA-NRCS, Ted Cashel, Fire Official/Emergency Management Coordinator, Lee O. Solow, Director of Planning, Douglas Schleifer, Environmental Commission Member, and Claudia Ceballos, Secretary.

There were no members of the public present.

**3. APPROVAL OF MINUTES**

a. The minutes of January 8, 2004 were approved as written and amended.

**4. BACKGROUND OF FLOOD MITIGATION PLANNING GRANT**

Mr. Skupien explained that FEMA- Flood Mitigation Program primary goal is to reduce repetitive flood losses. Once the plan is certified FEMA pays 75% and the Township pays 25% of the cost to prepare the plan. The program in New Jersey includes about 30 municipalities out of 566 that have done flood mitigation plans. Once the plan is completed it is reviewed by the State, neighboring municipalities, and the Corp of Engineers.

**5. & 6) STATE OEM/FEMA FLOOD MITIGATION PROGRAM REQUIREMENTS AND FLOOD MITIGATION PLANNING CHECK LIST**

Mr. Westfall briefly reviewed the attached checklist. Some of these items reviewed are as follows:

- a) Committee Organization
- b) Public Involvement, Coordination With Other Agencies

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- c) Assessing the Hazard
- d) Assessing the Problem
- e) Set Goals, Review of Possible Activities
- f) Implementation of an Action Plan
- g) Plan Adoption, Plan Monitoring and Evaluation

**7) REVIEW OF PAST FLOOD DAMAGE IN PRINCETON TOWNSHIP AND  
ANTICIPATED FLOODING CONCERNS**

A field trip to Harry's Brook preceded the formal meeting. Mr. Kiser, Mr. Skupien and Mr. Westfall met with concerned property owners who had experienced several recent floods on the main stem of Harry's Brook. The most recent flood occurred on December 11th. In the Meadow Brook area, there are certain homes that flood during times of severe rainfall.

Mr. Skupien advised he would like to receive feed back from residents, who may have had any flooding during Hurrricanes Diane in 1971 and Floyd in 1999.

There was considerable discussion regarding the "mega-mansions" re-development issue in the Township. This involves the purchase of existing residential properties, demolition of the existing structure and the building of a new large (in terms of square feet of impervious area) residential structure. While adequate stormwater management controls have existed for many years for multiple lot subdivisions, The Township is considering the addition of impervious area cover limitations and other stormwater management controls for single lot redevelopment.

**8) APPROVAL OF LETTER AND PUBLIC SURVEY TO BE SENT TO TOWNSHIP  
RESIDENTS WHO MAY BE IMPACTED BY FLOODING**

Copy of approved letter and survey, which will be mailed out to residents is attached hereto.

**9) ESTABLISHMENTS OF PUBLIC MEETING DATE AND TIME**

The Public Hearing is scheduled for March 25, 2004 at 7:00 PM in the main meeting room.

**10) SCHEDULE OF NEXT FLOOD CONTROL MEETING**

The next Flood Control Committee meeting will be held on March 24, 2004 at 3:00 pm in Meeting Room B.

**11) ADJOURNMENT**

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**Upon motion made** Dr. Richard Olsson the Committee agreed to adjourn the meeting at 5:30 pm.

Respectfully Submitted,

Claudia Ceballos, Secretary  
Shade Tree Commission  
Princeton Township

## 1. OPENING STATEMENT

The meeting was called to order at 3:11 PM with Mr. Kiser reading the opening statement as required by the Open Public Meetings Act, acknowledging that the notice of the meeting was adequately published.

## 2. ROLL CALL

**PRESENT:** Dr. Richard Olsson, Chair, May Papastephanou, Alvin Gordon.

**ABSENT:** Michael A. Celia.

**ALSO PRESENT:** Robert V. Kiser, P.E., Township Engineer, Lee O. Solow, Director of Planning, Ted Cashel, Fire Official/Emergency Management Coordinator, Joseph Skupien, PE, PP, SWM Consulting, Greg Westfall, Water Resources Planner, USDA-NRCS, Douglas Schleifer, Environmental Commission Member, Karen Hegener, Township Committee Liaison and Claudia Ceballos, Secretary.

There were no members of the public present.

**3. DISTRIBUTION OF MINUTES** There was no discussion about the minutes.

## 4. DONALD SIEJA; TERHUNE ROAD; BLOCK 7009, LOT 5

The Township Flood Control Committee for a third time considered the above referenced application. The Committee previously voted on July 26, 1999 and on April 29, 2002 and voted unanimously to recommend a waiver of on-site storm water detention at the above referenced site. This recommendation is contingent upon the applicant constructing a new 24" RCP Township storm sewer from the existing type B inlet on Jefferson Road across the applicant's property up to and including the proposed type B inlet #8 on Terhune Road as depicted on plans titled preliminary subdivision and minor site plan for Sieja Estate dated July 14, 2003.

This new storm sewer and easement is to be dedicated to Princeton Township and will convey both site runoff and existing runoff from the Terhune Road to Jefferson Road and into the

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existing Valley Road trunk sewer. The new storm sewer would allow for future extension by Princeton Township to the Dempsey Avenue area and divert these flows around the existing flood prone 12" RCP Terhune-Valley Road storm sewer.

The Flood Control Committee voted to support the recommendations of SWM Consulting as contained in their reports dated July 20, 1999, September 14, 1999, January 10, 2000, and February 14, 2004 and the recommendation of the Township Engineer, as contained in his reports dated January 28, 2002 and March 16, 2004 and recommended that a waiver of on-site detention be granted which will provide for the construction of the new storm sewer to address flooding concerns. The Committee will be sending a memorandum to Princeton Regional Planning Board advising of its recommendation.

**5. REVIEW OF THE FLOOD MITIGATION SURVEYS**

The members of the Committee reviewed all the surveys received. The Engineering Department received 115 surveys as of March 23, 2004, the results are as follow:

**Question 1:** How long have you owned your property?

Less than 1 year	=	2
1-5 years	=	12
6-10 years	=	15
11-20 years	=	26
21 + years	=	60
<b>Total</b>	=	<b>115</b>

**Question 2:** Have you sustained damage to your property due to surface water .....

Yes	=	59
No	=	56
<b>Total</b>	=	<b>115</b>

**Question 2a:** What type of damage occurred?

Structural Damage	=	3
Damaged Contents	=	15
Flooding	=	47
Erosion	=	37
Other	=	26 (while these answers varied – most mentioned flooding of the basement or damage to fencing)

**Question 2b:** How much did the damage cost you?

\$0	=	30
\$1.00 - \$500	=	4
\$501 - \$1500	=	7
\$1501 - \$5000	=	11
\$5001 - \$10,000	=	1
\$10,000 or more	=	6
<b>Total</b>	=	<b>59</b>

**Question 3a:** Did you have flood insurance at the time?

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Yes	=	14
No	=	45
<b>Total</b>	=	<b>59</b>

**Question 3b:** Did it help cover some of the costs?

Yes	=	4
No	=	10
<b>Total</b>	=	<b>14</b>

**Question 4:** Do you currently have flood insurance?

Yes	=	17
No	=	97
Don't Know	=	1
<b>Total</b>	=	<b>115</b>

**Question 5:** If yes, how long have you had flood insurance?

Less than 1 year	=	1
1-5 years	=	4
6-10 years	=	3
11-20 years	=	4
21 + years	=	5
<b>Total</b>	=	<b>17</b>

**Question 6:** What suggestions do you have to address flood damages in the Twp.....

No Answer/None	=	67
Those with answers	=	48 (see below)
<b>Total</b>	=	<b>115</b>

**Question 6: What suggestions do you have to address flood damages in the Twp..... (if answers were duplicated, they were not recorded twice)**

- I can only speak for my property – that is adjacent to Harry's Brook in my backyard. When there is torrential rain, water carried from upstream flood over the banks and into properties. To address the problem, we need to widen or deepen this section of the creek and reinforce the banks to allow water to flow downstream and prevent further erosion. All of which is beyond property owners' means to address.
- I own lots 17 & 18 in block 901 since the early 1960's and the water has never gone over the pipe we installed in the 60's.
- Site limitations on use of blacktop and other non-permeable paving
- Prevent leakage from the drainage pipes that go across the property that are used to drain the road
- Lake Drive will be re-done soon as well as Knoll Drive. If they get the reconstruction right, it may help
- I really don't know
- Since the bike path was added to our section of Mercer Road, I think the drainage in front of our house has gotten worse. I don't think the drainage "improvements" have reduced flooding.

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- A curb could be helpful to stem the flow of water toward the house
- Fix the “impromptu” stream situations
- Adequate culvert drainage for the 100 yr storm.
- Dredge the Stony brook so heavy rains do not create a lake effect on my property.
- New construction should have porous driveways – more restrictions on increasing the footprints of existing buildings to restrict extra run-off
- Prevent over-development which would affect our stream.
- Problem1-Flash flooding of Mountain Brook – Dredge, reroute stream and build berm to contain flood to south east side; Problem2- Flooding Stony Brook; dredge and clear floodway
- Luckily the flooding of the yard on Harry’s Brook did not reach the house – which was my main concern – but the yard was left in miserable condition
- Make sure that further development does not hinder absorption of rainwater. Avoid too much paving in the watershed
- Additional storm sewers on Snowden Lane; high curbs along the street; sidewalk at driveway entrance raised and slanted towards the street
- Keep Stony Brook (and flood plain) clear
- The flooding problem will not go away. I think it is necessary to find out what it would cost to do the most complete flood control job, even if it does not appear to be economically feasible. We shouldn’t approach this with preconceived notions about budget limitations
- I will defer to your Engineers and Township reported culvert work in progress
- Please do not do anything that would increase our cost of living here. To label our property in a flood plain is unbelievable
- Keep storm drains open. In front of my house I have done this job for 54 years
- It is imperative to keep the waterways free of debris and fallen trees. This preventative measure can reduce future flood damages – The township should help restore, expeditiously, excessive soil erosion – I feel one day our backyards are going to look like an abandoned streambed
- Berm the curving roads when or as the roads are being paved
- Couple each development with a detention basin
- Don’t build on flood plains
- Limit further construction around streams and provide appropriate run-off drains where needed to prevent flooding in the future
- Individuals upon purchase of the property, should know the probability of a flood occurring on that property. Hence they are responsible for obtaining flood insurance
- Better planning by Township of permits to develop lands
- Stop development on the Stony Brook. Stop paving all driveways and parking
- While we do not have a stream behind our house it is 20-30 feet below the level of our home
- Rigidly enforce our flood control and stream corridor ordinances. Over development and inattention to development controls on wetlands are the underlying causes of Princeton’s flood problem. Give more variances to build on wetlands
- Limit new impervious cover in watershed and require new owners/developers to manage increased run-off on-site.

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- No Idea
- Allow refilling of eroded areas
- To reinforce the sides of Harrison Brook and to widen the channel under Roper Road bridge to facilitate water flow
- Unlike any of my neighbors on Bertrand Drive and Dodds Lane, we do not have flood/water problems. As you know trees play a very important role in preventing floods. Do not consider development, parks, or roads that would result in destruction of trees in any flood sensitive area of Princeton
- Do not clear any land (cut trees) by Smoyer Park
- Enforce requirements for detention/retention ponds in developments and parking areas
- At Route #27 and Harry’s Brook the brook continually fills with dirt, leaves branches and garbage presumably causing a backup due to slower output into Carnegie Lake
- Annual site checks to determine future flood issues or problems before they happen
- Only occurred once during the worst flood. Flood insurance is a good alternative
- Our neighbors just removed hundreds of trees, how could the Township allow such a thing !! They removed trees in a flood plain, shame on the ordinance. Removal of thus to this extent should not be allowed, it causes runoff.
- Alter grading so all water flows into the Borough
- Disallow loss of surfaces that absorb water. Keep a watchful eye on the dam – does it control water flow in the lake?
- Clean up and maintain old basins (three water retainers were abandoned along Thanet Road)
- Adjust/modify water inlet in the newer basins (to elevate water level and increase capacity)
- Major dredge of the brook from garage and build up, followed by routine maintenance
- Repair the damage done to the banks of the brook (i.e. washed away soil, exposed manhole, etc.) and construct “stonewall” to prevent future damage (as done by Princeton Borough)
- Replace/adjust culvert to allow better water flow. At the corner of Braeburn Dr. \* Meadowbrook Dr. – the pipes openings are too small. They are also falling apart. Under Thanet Road – the pipes orifices are too high above water level. Water cannot flow through – even under flood conditions.
- Stop any development (especially at the Shopping Center); improvement/expansion of existing building, new construction, driveway and parking lot or any other “ground cover” structures.
- Convert unused, low open space areas to new water basin (side section of the park, next to Grove Ave., between the medical center and the corner of Thanet Road & Terhune Road etc.).

Question 7: **Question 7:** Additional Comments: (if answers were duplicated, they were not recorded twice)

No Answer/None	=	64	
Those with answers	=	51	(see below)
<b>Total</b>	=	<b>115</b>	

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- The house was built on this property in 1939, to the best of our knowledge, no damage has occurred
- I am also concerned about the health hazard caused by flooding. Debris and sometimes dead animals and birds were washed up to the yard
- I have pictures of some of the worst storms and the water did not go over the stream bank or pipe
- The flow from up the road continues to worsen when it rains. The standing water before the bridge becomes the bigger problem; potential skidding if frozen, hydroplaning and mosquito haven. Note some erosion on the other side of bridge – an accident waiting to happen
- Because of the leakage in the pipes one water table has been high and has damaged the basement well and resulted in sump pump burnout
- Thank you for addressing this serious problem
- Our mailbox needs to be moved farther from the road. It now sits in the gully by the side of the road, which is often full of water after a rainstorm or melting snow. The wooden post will quickly rot out. Before the road was widened, our mailbox was on “high” ground. I’ll be in touch regarding this matter
- We had considerable damage recently when our sump pump failed and a foot of water flooded our basement
- Don’t make it worse
- I would like to be informed about this flood mitigation plan when it is established
- I have never had a wet basement nor do I think that previous owners ever had any problems because it is a finished basement. The way my property is; my lower area has the stream and is kept in a pretty natural state. The house is on the hill where no flooding ever can occur.
- I have enclosed current photo’s of present status of my property effected. I have to have a commercial chipper come every spring to clear property of flood debris – entire trees end up on hunt farm – must be cut up and removed (photo’s are located in survey folder)
- The creek running through our property constantly floods lower garden and banks are eroding badly – stream bank restoration would help during the last 24 years clean up along the banks of this section has only happened once about 22 years ago
- I hired a lawn company to take care of the miserable condition of the property and it still is not up to par. Often the flooding is caused by big branches or debris blocking the flow of the water – When I notice it I immediately call your office – but what if I wasn’t here?
- We do not need flood insurance
- Katherine Reed Ellington the former owner also claimed no flooding between 1941 and 1979
- “Rip-wrapping” the shoreline of Stony Brook would be prohibitive for the Township and residents. Stony Brook which does not relieve us, unfortunately, insurance cannot replace one-of-a-kind destroyed items.
- We are 125’ above sea level and 50+’ above Stony Brook. Half of Mercer County would be under before us.
- My damage has been from heavy rainstorms that couldn’t be carried away. While my husband lived, we considered flood insurance but it was a national thing and our policy

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(more than we could afford) had a premium to help the people of areas in our country that are traditionally flood prone.

- Our land is saturated because of excessive water runoff. The rain water then seeps through foundations. We also get flooded when the rain water runoff floods the stream and backs up to our garage. Our house is some 250 feet away from the stream bank. Our town needs to impose very strict rules when it comes to allowing further development along the Harry's Brook Basin or along areas that drain into Harry's Brook. Harry's Brook has not been able to contain rain water runoff for years. But since the drought season ended, the flooding conditions are no longer related to Hurricane only. The properties along the basin are getting flooded every month. The more we crowd the land with buildings the greater the damage to an already intolerable situation
- Our house is about 15' above flood level and in any case, the main level is 10' higher.
- This is successful at my address except for a real except for a real cloud burst when the water is soon dispersed and flows on into the lake level.
- Before hurricane Doria we had only a small culvert (36") to carry Harry's Brook by our land. After this flood, twice in 1 day we were we were finally successful in having the County construct a single lane bridge over the brook at the cul-de-sac end of Locust Lane.
- Our house is dry – it is built high
- Is this really a problem? Why not fix the potholes?
- My house is well elevated from the floodline.
- Stony Brook has lost most of its floodplain due to over-development and poor building and too much asphalt paving. How about limiting the square feet of asphalt permissible per development (like PondView)? Whats wrong with old-fashioned gravel? Runoff controls are needed.
- Acquire as protected open space wetlands, stream corridors and drainage lands with open space tax monies and D&R Greenway assistance, Mercer County and NJ Green Trust monies.
- Be aware of the damage of rapidly moving flood waters.
- Maintain drainage (easement) ditch from Terhune/Van Dyke behind Meadowbrook. Be very weary of downstream effects of development n/w above Terhune. Provide technical advice to property owners in drainage/stream corridors about feasible individual property drainage improvements.
- There is absolutely no problem with water runoff or drainage on my property.
- From what I understand, flooding is a natural part of weather. If people live near a stream they ought to expect flooding. I would be very concerned if efforts were made to control flooding which resulted in an unbalancing of the eco-system, as has happened in many rivers.
- Our property is low only on the far right side and far left side. The house and pool are well elevated. Stony Brook has not exceeded its floodplain on our side of the stream since that one storm.
- Cannot imagine a flood actually approaching the house although could certainly reach a lower part of the yard.
- Although our property is in a flood zone, due to its elevation, the house is not.
- We have a stream on our property that runs under a main sewer line through two culverts. These culverts need to be cleared of debris every few months. When I was younger, I

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used to keep the culvert clear. I've asked the Township Engineering to do this regularly, but they don't seem to do this. They came exactly once, but it needs regular attention.

- Advise homeowners that heavy rains raise the water table even for streams. Be sure sump pumps are working. Suggest generator to run pump if power fails. (Do not run it indoors).
- Drainage of water from Maybury Hill is excessive, need basin. Please do something or call.
- Currently the creek in my backyard is getting wider due to erosion of land from overflowing during heavy rains and snowfall.
- I don't think there has been any "damage" other than rare flooding of the front yard and limited access due to road closures.
- Run off from adjacent properties – not stream.
- The previous owner has Floyd problems. The water rose all the way to the swimming pool. He had to drain, clean and repaint. Also he installed plugs for generator to pump water out of basement
- See 59 Meadowbrook Drive file in the Engineering Department

Copies of the surveys were given to everyone present, Mr. Kiser asked that everyone take the surveys and review them individually.

#### **6. DISCUSSION REGARDING PUBLIC MEETING ON MARCH 25, 2004**

Mr. Kiser reviewed the proposed internal agenda with the members of the Committee. Ms. Hegener, Township Committeewoman, will welcome everyone at the Public Hearing. Dr. Olsson will introduce the Committee Members and generally discuss what a flood mitigation plan is, and how it would make the Township eligible to apply for grants. Mr. Westfall prepared a power point presentation for the Public Hearing, which will explain the flood mitigation planning process, and the proposed scope of work. The Committee reviewed and suggested modifications to Mr. Westfall's presentation. Mr. Kiser will discuss completion of the surveys and the status of various Township Improvement projects relating to flooding. Mr. Skupien will discuss funding, studies, and the new rules related to the Flood Mitigation Plan, including the Millstone River Steering Committee involvement, the development/redevelopment study and storm water management issues

The public comments will be limited to two to five minutes depending on how many residents wish to speak.

#### **7. REVIEW OF PAST FLOOD DAMAGE IN PRINCETON TOWNSHIP AND ANTICIPATED FLOODING CONCERNS**

There was considerable discussion regarding the "mega-mansions" re-development issue in the Township. This involves the purchase of existing residential properties, demolition of the existing structure and the building of a new large residential structure with large amounts of new impervious areas. While adequate stormwater management controls have existed for many years for multiple lot subdivisions, The Township is considering the addition of impervious area cover limitations and other stormwater management controls for these type single lot redevelopments.

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**8. SCHEDULE OF NEXT MEETING/OPEN DISCUSSION**

The next public hearing will be in September 2004.

**9. ADJOURNMENT**

The meeting was adjourned at 5:00 PM.  
Respectfully Submitted,

Claudia Ceballos, Secretary  
Princeton Township  
Flood Control Committee

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TOWNSHIP OF PRINCETON  
**FLOOD CONTROL COMMITTEE**  
**Minutes of Public Hearing**  
**Thursday, March 25, 2004 – 7:00 PM**  
**Municipal Complex, Meeting Room B**  
**400 Witherspoon Street, Princeton, New Jersey**  
**609-921-7077**

**1. OPENING STATEMENT**

The meeting was called to order at 7:14 PM with Dr. Richard Olsson, Chair reading the opening statement as required by the Open Public Meetings Act, acknowledging that the notice of the meeting was adequately published.

**2. ROLL CALL**

**PRESENT:** Dr. Richard Olsson, Chair, May Papastephanou, Alvin Gordon.

**ABSENT:** Michael A. Celia.

**ALSO PRESENT:** Robert V. Kiser, P.E., Township Engineer, Joseph Skupien, PE, PP, SWM Consulting, Greg Westfall, Water Resources Planner, USDA-NRCS, Mr. Ted Cashel, Fire Official/OED Coordinator, Karen Hegener, Township Committee Liaison, William Enslin, Deputy Mayor, and Claudia Ceballos, Secretary.

**MEMBERS OF THE PUBLIC:** Approximately 40 members of the public were present.

**3. OPENING PUBLIC MEETING**

**a. Welcoming Remarks**

Ms. Hegener welcomed everyone. She advised that the Township does not designate the flood areas, the surveys were sent out based on the information gathered from the State and FEMA. She said that the Township will be preparing a flood mitigation plan for the Township, which will make the Township eligible for federal funds to reduce flood damages.

**b. Introduction and Meeting Purpose**

Dr. Olsson introduced the members of the Flood Control Commission.

He invited the public to take a look at the flood plain maps on the walls in the room.

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**c. Princeton Township Flood Mitigation Planning Process**

Mr. Greg Westfall, Water Resource Planner of the USDA-NRCS, introduced himself. He presented a power point slide, which outlined the Mitigation Planning Process:

- i. Introduction
- ii. Purposes of the Flood Mitigation Planning Process
- iii. Proposed scope of work – Community Organization
  - a) Public Involvement
  - b) Coordination with other Agencies
  - c) Assessing the Hazard
  - d) Assessing the Problem
  - e) Set goals
  - f) Review of Possible Activities
  - g) Implementation of an Action Plan
  - h) Plan Adoption
  - i) Plan Monitoring and Evaluation

**d. Public Comments**

Mrs. Applegate of 98 Ramdon Road – spoke about the Harry's Brook neighborhood on the east end of the Township. Mrs. Applegate said that every time there is a heavy rain, her property near the stream has excessive erosion. She said that it is imperative that the Township keep the water ways free of debris and fallen trees to reduce future flood damages, she also said that the rain seeps through the foundation. She asked that the Township impose rules when it comes to allowing further developing.

Mr. Alan Zetterber of 124 Random Road – spoke about the increased erosion in his backyard in the last couple of years. He is very concerned with the danger that this flooding represents since he has small children.

Mr. Norm Glickman of 37 Poe Road – asked that the Township limit the impervious cover, address runoff

Mr. Jeffrey Orleans of 107 Meadowbrook Drive - mentioned the erosion problems he is having in his property. He requested that the Township maintains the drainage easements.

Mr. Jonathan Smith of 739 Prospect Avenue – he said that the Carnegie Lake comes up very quickly and erosion is getting worst. He commented of the rebuilding of small houses into mansions, drainage issues. \

Mrs. Nira Lavid of 59 Meadowbrook Dr. - She said that her property has had thousands of dollars worth of damages. She asked that the Township maintains the basins, clean debris from the stream in a regular basis, stop development especially at the Shopping Center, the drainage pipes by the Princeton Medical Center need to be lowered.

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Mrs. Elizabeth Wood of 390 Gallup Rd. – near the Stony Brook off Princeton Pike, the flooding problem has grown worse over the years as houses are erected in the area. She would like the Township to offer some kind of assistance with the landscaping to replace soil.

Mrs. Judith Applegate of 71 Quaker Road – her deer fence was damaged by blocks of ice flooding into her property. She said that the Stony Brook has lost most of its flood plain due to over-development and too much asphalt paving. Township needs to control the runoff, what about gravel driveways?

Mr. Robert von Zumbusch of 1113 Princeton-Kingston Rd., he strongly supports storm water detention systems and the maintenance necessary to maintain them, very concerned with the impervious coverage, the increase in tear-downs and the subsequent building of larger houses in their stead makes this a greater issue, he is very concerned that proposals to build flood control dikes in the Manville and Zarephath areas that would drastically narrow the floodway in those areas will exacerbate flooding upstream.

Jesse Applegate of 98 Random Rd. – showed a videotape of the Harry's Brook. (Tape is available at the Princeton Township Engineering Department).

A homeowner of Route 206, across from Nassau Oil, requested that the Flood Plain be revised, his property is in the flood plain area, but he has never experienced any flooding. He is restricted from building any addition because he is in the flood plain.

**d. Township Involvement-Follow Up**

Mr. Kiser advised that all the information will serve to prepare a flood mitigation plan for the Township, which will make the Township eligible for federal funds to reduce flood damages. The Township has received a grant to cover 75% of the cost.

Mr. Kiser informed that the Township sent out 400 letters, 150 surveys were returned. A summary of the surveys received show that the properties which experienced structural damage or damage of contents are as follow:

Harry's Brook – nine properties – estimated cost of damages \$116,500.00  
Stony Brook – five properties – estimated cost of damages \$60,900.00  
Lake Carnegie – five properties – estimated cost of damages is unknown  
Mountain Brook – two properties – estimated cost of damages is \$120,000.00

Mr. Kiser mentioned the Township Improvement Projects: Fairway Drive Storm Sewer, Prospect Avenue Storm Sewer, Mountain Lakes Dam, Smoyer Park Dam, and the on going cleaning of culverts and catch basins through out the Township.

Mr. Bill Enslin said the Master Plan Subcommittee of the Planning Board is reviewing the regulations for the rebuilding of the McMansions

**e. Funding/Studies/New Rules**

Princeton Township Flood Mitigation Plan  
January 2006

Mr. Skupien explained that FEMA- Flood Mitigation Program primary goal is to reduce repetitive flood losses. Once the plan is certified FEMA pays 75% and the Township pays 25% of the cost to prepare the plan. The program in New Jersey includes about 30 municipalities out of 566 that have done flood mitigation plans. Once the plan is completed it gets reviewed by the State, by neighboring municipalities, and the Corp of Engineers. Mr. Skupien advised that it is a federal requirement that every municipality develops a storm water management plan.

Mr. Skupien said that the problem does not lie strictly in the fact that Princeton Township is an expanding community, it is not like Princeton Township has grown from 5,000 people in the past five years, while more development is one factor, Mr. Skupien said the flooding could be the result of increased rainfall levels in the past several years. He cited recent studies performed by the National Oceanic and Atmospheric Administration indicating more abbreviated, heavy rainfalls. "Rather than getting two inches in six hours, we could get two inches in two hours," he said. He also made reference to the "randomness" of flooding in general. Pointing to the drought that had been ongoing since 1996, Mr. Skupien said once regular weather patterns began to emerge by the end of 2002, regular flooding also returned to the region.

**f. Next Steps/follow up Public Meeting in September**

Dr. Olsson advised that there will be another public hearing in September 2004.

**g. Closing Remarks**

Ms. Hegener thanked everyone for coming to the meeting and said the Township is looking forward to get the residents comments on the proposed flood mitigation plan, and to inform the neighbors in the area, the more we know the better we react.

**9. ADJOURNMENT**

The meeting was adjourned at 9:10 PM.  
Respectfully Submitted,

Claudia Ceballos, Secretary  
Princeton Township  
Flood Control Committee

Princeton Township Flood Mitigation Plan  
January 2006

TOWNSHIP OF PRINCETON  
**FLOOD CONTROL COMMITTEE**  
**Minutes of Meeting**  
**Wednesday, June 30, 2004 – 4:00 PM**  
**Municipal Complex, Meeting Room B**  
**400 Witherspoon Street, Princeton, New Jersey**

**1. OPENING STATEMENT**

The meeting was called to order at 4:10 PM, Mr. Kiser read the opening statement as required by the Open Public Meetings Act, acknowledging that the notice of the meeting was adequately published.

**2. ROLL CALL**

**PRESENT:** Dr. Richard Olsson, Chair, May Papastephanou, Alvin Gordon  
Michael Celia, Douglas Schleifer, Environmental Commission  
Member, and Karen Hegener, Township Committee Liaison and  
Anne Criscitiello, Secretary.

**ABSENT:** None

**ALSO PRESENT:** Joseph Skupien, PE, PP, SWM Consulting, Greg Westfall, Water  
Resources Planner, USDA-NRCS.

There were no members of the public present.

**3. DISTRIBUTION OF MINUTES**

- a. Minutes of January 26, 2004 approved as written and amended.
- b. Minutes of March 24, 2004 approved as written and amended.
- c. Minutes of March 25, 2004 approved as written and amended.

**4. REVIEW OF DRAFT PRELIMINARY FLOOD MITIGATION PLAN**

Westfall reported that he meet with Bob Kiser and Joe Skupien on June 18, 2004 and incorporated their comments. Westfall said that he has some problems with the table of contents will be doing further work on this. More photographs will be included. Revisions will be done on the maps; he is working with Fred Schulz of the Engineering Department. Harry's Brook and Quaker Road have been closed due to flooding, Sgt. Mike Henderson will give status as to how often it has been closed due to flooding during this past year.

Westfall said that is getting house elevation on Locust Lane (reduce the repetitive flood loss structures as per OEM). Elevations are measured to the bridge bench mark (County requirements). He also will get the elevations for the Meadowbrook area.

PL566 (Watershed protection and Flood Control Program) Core of Engineers wants to add a table to ascertain dollar amounts.

Celia said that regarding the cost/benefit option, what if the Township purchased the structure?

Princeton Township Flood Mitigation Plan  
January 2006

Westfall said that it is one option but all the details are not developed and would not be funded through the Township.

3. Skupien said that money will be available through Greg Westfall's agency, Core of Engineers and FEMA(grant money).

Westfall said that federal grants will cost share up to 75% of costs. He would like to see State funding (must wait for something to happen though).

Skupien added that there is little public funding for this program. On the Action Plan Section - there should be something about the Township working with the Districts. (This should be added to the Recommendations).

Item 1 - 50/50 cooperative funding. (Real concern is level of funding)

Item 2 - Redevelopment Skupien is working on the findings (i.e. impervious surface, avoiding runoff. )

Item 3 - Westfall asked if the Borough has a Stormwater management ordinance. Kiser advised that only what the University has implemented. Skupien said that the Borough will have to develop within the year due to the new State regulations. All Borough runoff eventually enters the Township, both municipalities should work together on coordinating the Stormwater management plans (cooperatively). Kiser said that the Borough should work through the joint body of Planning Board.

Item 4 – Skupien said that dam upstream of Locust Lane could impact houses (repetitive flood loss structure) include this in the solutions.

Item 5 – Skupien said that once the plan is in place one can apply for funding (example road closures, erosion problems). Olsson said that the impact of development causes erosion.

Celia recommends that item 5 and 6 be combined. Westfall mentioned dropping financial assistance from #6. Skupien said that #8 is also about funding, 5 & 8 should be combined as a last recommendation, then list different funding sources and projects in bulleted format.

Westfall will add Environmental Infrastructure Funding as a source.

Schleifer said that DOT might have some funding, Westfall will look into that.

Item 8 – Westfall said this section is a great source of help.

Schleifer recommended prioritizing areas for open space acquisition or conservation easements (check map prepared for open space plans as Green Acres), Kiser said that the criteria should be more specific. Schleifer said there is a need to establish riparian areas as a priority for acquisition. Van Horn Brook nominated by DEP for Category 1- higher protection status (300-ft buffer) and received protection; the Committee should support this designation via a letter. Westfall asked about redevelopment of the area. Kiser advised that this a service zone and he should check with the Planning Board.

Item 3 – Kiser asked to include the delineation of riparian areas as Critical Erosion Area. Kiser will speak to Lee Solow, Director of Planning.

Schleifer – Planning Area 5 – Environmentally sensitive areas (more protection from the state plan)

Celia asked why just focusing on riparian areas. Skupien said that riparian areas are indirectly impacted by Flood Mitigation measures. Should include map with riparian areas.

Schleifer – will prepare wildlife corridor Critical Habitat Map

Princeton Township Flood Mitigation Plan  
January 2006

Westfall – informed that he is working with Fred Schultz of the Engineering Department on completing the mapping.

Skupien said that once he gets the riparian map Westfall will coordinate with Kiser and Solow. Items 5 & 8 funding combination must make sure all points are identified (repetitive loss, road closures, etc)

Schliefer – top of page 51 (2<sup>nd</sup> bulleted section) asked for definition of “responsibility for their actions? Westfall said that it was taken from FEMA State Ordinance (evacuate when told, keep inventory of merchandise/belongings, etc.)

Mr. Westfall will add Environmental Infrastructure Funding as a source.

Mr. Schleifer said that the DOT may have some funding available. Mr. Westfall will look into this.

Mr. Schleifer also asked that #8 OES be changed to ESP (Environmental Services Program).

Recommendation # 7 – Mr. Westfall said this recommendation is a great source of help.

Recommendation # 9 – Mr. Skupien asked where did the changes mentioned come from? Mr. Westfall advised that it came from the State.

Mr. Westfall advised that the ordinance was changed.

Recommendation # 8 – Mr. Skupien said to change “existing sediment and control erosion”.

Mr. Schleifer has three recommendations from an environmental perspective:

- 1) Prioritize the riparian areas for open space acquisition or conservation easements (check maps prepared for Open Space Plan as Green Acres). Mr. Kiser said that the criteria should be more specific. Mr. Schleifer proposed to establish riparian areas as a priority for acquisition.
- 2) Van Horn Brook nominated by DEP for category 1 – higher protection status (300 ft. buffer), this should be supported via a letter. Mr. Westfall asked what about redevelopment of the area? Mr. Schleifer said that what is there can be rebuilt. Mr. Kiser said that if the lot is a service zone he should check with the Planning Board.

Delineate repair areas as either planning area or as critical erosion. Sites under the State plan with the office Smart Groth (Municipality can delineate with cross acceptance process). Mr. Kiser advised that this should be discussed with Lee O. Solow, Director of Planning. Mr. Schleifer said the repair areas def. – Hydrological connected areas in the landscape (i.e., wetlands, hydro soils) can include a wildlife 300 ft. buffer on all streams. All these features have an effect on the flood plain. Mr. Westfall said that this could be included under beneficial functions. Mr. Schleifer said that Planning Area 5 is an environmentally sensitive area (more protection from the State plan)

### Goals and Objectives

Skupien will provide State development and redevelopment plan recommendations, Schliefer added that this should be added to the Master Plan and it's a good way to generate ordinances. Celia asked why only focus on riparian areas? Mr. Skupien responded that riparian areas are impacted by flood mitigation measure. It should include map with repair areas. Schleifer will prepare maps with and without wildlife corridor. He will use the Federal and State data to prepare the critical habitat map. Westfall will be working with Fred Schultz of the Township Engineering Department on the mapping. Skupien said that once Schleifer gets the riparian area maps, Westfall would coordinate with Kiser and Solow.

Princeton Township Flood Mitigation Plan  
January 2006

Regarding #5 and # 8, Skupien said that the funding combination must make sure all point are identified (repetitive loss, road closure, etc.).

Schleifer said that top of page 51 (2<sup>nd</sup> bulleted section), he asked for definition of “responsibility for other actions”.

Westfall explained that it was taken from the State (FEMA) ordinance, (evacuate when told, move belongings, etc.)

Skupien recommended to notify people regarding flood damage protection and to make sure that they understand and are areas of the programs.

Schliefer wants more language regarding prioritize more material measures fro detention basin.

Westfall said that this is just a recommendation from the ordinance language. Skupien said we must reference the Stormwater Management rules under the Township Stormwater Management Plan.

Kiser recommended to make the changes, and get back together for a final review prior to the Public Hearing in the Fall.

**5. DISCUSSION REGARDING PUBLIC MEETING TO PRESENT THE FINAL FLOOD MITIGATION PLAN**

Public Hearing was tentatively planned for sometime in October.

**6. SCHEDULE OF NEXT FLOOD CONTROL COMMITTEE**

Tuesday, September 21<sup>st</sup> at 4:00 PM.

**7. ADJOURNMENT**

ADJOURNED at 5:40 pm

Princeton Township Flood Mitigation Plan  
January 2006

TOWNSHIP OF PRINCETON  
**FLOOD CONTROL COMMITTEE**  
**Minutes of Special Meeting**  
**Wednesday, November 15, 2004 -4:00 PM**  
**Municipal Complex, Meeting Room B**  
**400 Witherspoon Street, Princeton, New Jersey 08540**

**1. OPENING STATEMENT**

The meeting was called to order at 4:20 PM, Chair Olsson read the opening statement as required by the Open Public Meetings Act, acknowledging that the notice of the meeting was adequately published.

**2. ROLL CALL**

**PRESENT:** Dr. Richard Olsson, Chair, May Papastephanou, Michael Celia, Karen Hegener, Township Committee Liaison, Robert V. Kiser, P .E., Township Engineer and Claudia Ceballos, Secretary.

**ABSENT:** Alvin Gordon, and Douglas Schleifer, Environmental Commission Member.

**ALSO PRESENT:** Joseph Skupien, PE, PP, SWM Consulting, Greg Westfall, Water Resources Planner, USDA-NRCS.  
There were no members of the public present.

**3. REVIEW OF DRAFT PRELIMINARY FLOOD MITIGATION PLAN**

Westfall advised that he is trying to get more pictures from the residents of the flooding areas. The Committee members reviewed the pictures included and after discussing some of the pictures will be removed from the plan.

Kiser requested that a revision be made to Pg. 58 from 2005 to 2007.

Skupien- under Public Information -we should work to improve the flood insurance premiums (pg 55) Table 10 -Public Information; it should be a fact sheet, information pack, and technical solutions.

Section H .

I. Road Flooding Safety

1. Establish Stony Brook waterway gauge for Quaker Rd Flooding
2. Link Stream Gage output to Emergency Managers (police & DPW)
3. Install warning signs

Hegener said that the plan should provide a list of what the benefits are of having flood insurance. Westfall mentioned that there is great information if one visits [www.floods.org](http://www.floods.org).

IV Private Property Flood and Stream bank Erosion Mitigation -Hegener asked that 4 & 5 be merged together and list the offices of the Environmental Services.

Princeton Township Flood Mitigation Plan  
January 2006

Table 10 -Action Plan Timetable -the Committee members discussed this table and decided to remove 2004 and start the chart with 2005.

**Summary** -Westfall presented the preliminary Flood Mitigation Plan which is completed and outlined several of the major points of the Action Plan:

- 1) The incorporation of a Flood Overlay Zone into the Township Ordinance, which included classifying flood areas as critical environmental sites from the State Plan Cross Acceptance delineations.
- 2) The production of a Stormwater Management Ordinance for land Development and re-development
- 3) PEC and Regional Planning Board assessments of Stormwater impacts for development and re-development.
- 4) The prioritization of riparian areas for Open Space and Conservation Elements.

5) An Erosion Sedimentary inventory utilizing a \$2,500 matching grant from the Stony Brook Millstone

Watershed Association, which he noted, might begin as a GIS analysis for the identification of erodible soils because it is less expensive.

**4. DISCUSSION REGARDING PUBLIC MEETING TO PRESENT THE FINAL FLOOD MITIGATION PLAN**

Westfall said that revisions to the plan should be made by the end of the month. Kiser said that the Committee needs to meet before presenting the plan to the neighbors. The plan should be ready to present to the neighbors the week of January 17, 2005.

**5. SCHEDULE OF NEXT FLOOD CONTROL COMMITTEE**

Kiser announced the Committee will be meeting again on Wednesday, December 8th at 4:00PM.

**6. ADJOURNMENT**

Meeting was adjourned at 6:07 pm.

Princeton Township Flood Mitigation Plan  
January 2006

TOWNSHIP OF PRINCETON  
**FLOOD CONTROL COMMITTEE**  
**Minutes of Special Meeting**  
**Wednesday, December 8, 2004 – 4:00 PM**  
**Municipal Complex, Meeting Room B**  
400 Witherspoon Street, Princeton, New Jersey

**1. OPENING STATEMENT**

The meeting was called to order at 4:20 PM; Chairman Olsson read the opening statement as required by the Open Public Meetings Act, acknowledging that the notice of the meeting was adequately published.

**2. ROLL CALL**

**PRESENT:** Dr. Richard Olsson, Chair, May Papastephanou, Karen Hegener, Township Committee Liaison and Robert V. Kiser, P.E., Douglas Schleifer, Environmental Commission Member and Claudia Ceballos, Secretary.

**ABSENT:** Alvin Gordon and Michael Celia.

**ALSO PRESENT:** Joseph Skupien, PE, PP, SWM Consulting, Greg Westfall, Water Resources Planner, USDA-NRCS, Ron Dilapo, Fire Official.  
There was one (1) member of the public present.

**3. REVIEW OF DRAFT PRELIMINARY FLOOD MITIGATION PLAN**

Kiser said that the current document for review was the fifth revision to the draft preliminary flood mitigation plan. The purpose of the meeting is to finalize the Plan and to schedule the Public Hearing, which should be held sometime in January 2005. Members reviewed the proposed plan and made various revisions. Westfall will update the proposed flood mitigation plan. The proposed maps were also reviewed and marked for revisions; Fred Schulz of the Engineering Department will do these revisions.

**4. SCHEDULE OF PUBLIC MEETING TO PRESENT THE FINAL FLOOD MITIGATION PLAN**

Kiser announced that the Public Hearing is tentatively scheduled for January 24, 2005 at 7:00 PM in the Municipal Hall, main meeting room. Ceballos has to check with the Clerk's office and make sure that there is not a Township Committee meeting scheduled for the 24<sup>th</sup>.

**SCHEDULE OF NEXT FLOOD CONTROL COMMITTEE**

After reviewing their calendars, members decide to meet again for a final review of the Plan on January 19, 2005.

**ADJOURNMENT**

ADJOURNED at 6:12 pm.

Princeton Township Flood Mitigation Plan  
January 2006

TOWNSHIP OF PRINCETON  
**FLOOD CONTROL COMMITTEE**  
**Minutes of Special Meeting**  
**Wednesday, January 19, 2005 – 4:00 PM**  
**Municipal Complex, Meeting Room B**  
400 Witherspoon Street, Princeton, New Jersey

**1. OPENING STATEMENT**

The meeting was called to order at 4:10 PM, Chairman Olsson read the opening statement as required by the Open Public Meetings Act, acknowledging that the notice of the meeting was adequately published.

**2. ROLL CALL**

**PRESENT:** Dr. Richard Olsson, Chair, May Papastephanou, Michael Celia, Thomas Golobish, William Enslin, Township Committee Liaison and Robert V. Kiser, P.E., Douglas Schleifer, Environmental Commission Member and Claudia Ceballos, Secretary.

**ABSENT:** Casey Hegener, Environmental Commission Member.

**ALSO PRESENT:** Joseph Skupien, PE, PP, SWM Consulting, Greg Westfall, Water Resources Planner, USDA-NRCS.

Martin Brophy, Diane Zipperstein, Denise Wood, John L. Kelsey, Chris Tarr, Tom O'Shea, Jim Britt.

**3. RESOLUTIONS REGARDING OPEN PUBLIC MEETINGS ACT**

Notice of Special Meetings

Charges to subscribers for agenda mailings

**Upon motion made by** Olsson and seconded by Papastephanou, Committee approved the resolutions for Notice of Special Meetings and Charges to subscribers for agenda mailings as written and distributed.

**4. ADMINSTRATIVE MATTERS**

i. Nomination and appointment of Chair

Papastephanou nominated Dr. Richard Olsson to remain as Chair for another term.

ii. Nomination and appointment of Vice Chair

Dr. Olsson nominated May Papasthephanou as Vice Chair

iii. Appointment of Secretary

Chair Olsson appointed Claudia Ceballos to remain as Secretary.

**Upon motion made by** May Papasthephanou and seconded by Michael Celia the Committee unanimously accepted and approved the slate of candidates as presented.

iv. Introduction of New Township Committee Liaison

Kiser introduced Township Committee Member, William Enslin.

Introduction of New Environmental Commission Liaison (to be announced)

Introduction of New Commission Member

Kiser introduced and welcomed Mr. Thomas Golobish.

Princeton Township Flood Mitigation Plan  
January 2006

**5. APPROVAL OF MINUTES**

Minutes of November 15, 2004

**Upon motion made by** Olsson and seconded by Celia the Committee approved the minutes of November 15<sup>th</sup>, 2004 as written and amended.

Minutes of December 8, 2004 (this item was tabled to the next meeting).

**6. APPLICATIONS**

**a. Wood/Borchert 132 Pretty Brook Road, Section 6601 Lot 1**

**“Detention Basin Waiver Request”**

Denise Wood and William Borchert, owners of Block 6601, Lot 1, have filed an application with the Regional Planning Board for preliminary and final major subdivision approval to subdivide their lot into three conforming lots for residences. The current property located at 132 Pretty Brook Road contains 25.046 acres and is the site of one home and several outbuildings. The existing home and auxiliary buildings would remain and occupy proposed Lot 1.01 (17.2501 acres) utilizing the existing driveway from Pretty Brook Road. Two additional lots would be created for future home construction. These are proposed Lots 1.02 (3.7878 acres) with driveway access to be provided from North Road and proposed Lot 1.03 (4.00 acres) with driveway access from Winfield Road, an unimproved street whose dedicated right-of-way are owned by Princeton Township. No detention basin is proposed for the subdivision. The applicant is requesting a waiver from the onsite detention requirement. In-lieu of constructing an onsite basin the applicant proposes to provide a cash contribution to the Township, which would be used to improve the Mountain Lakes dams where detention could be provided.

The Committee voted unanimously to recommend approval of the requested waiver for on site detention subject to an acceptable monetary contribution being made to the Township’s Mountain Lakes Dams Restoration escrow account as determined by the Township Engineer. In addition, the Flood Control Committee endorsed the recommendations of the Township Engineer and SWM Consulting included in their reports dated January 20, 2005.

**7. BUSINESS**

**Review of Flood Mitigation Plan**

The Committee discussed Westfall’s power point presentation for the Public Hearing, various changes were recommended, Westfall will revise the presentation.

**b. Coordination for January 24<sup>th</sup> Flood Mitigation Plan Public Hearing**

The Committee reviewed and approved the proposed agenda for the public hearing.

**c. Schedule of Next Flood Control Committee Meeting**

The Committee will be meeting on the first or second week of February.

**8. ADJOURNMENT**

ADJOURNED at 7:13 pm.

## **Property Owner Survey Questionnaire and Final Survey Results**

Princeton Township Flood Mitigation Plan  
January 2006

January 2, 2004

Princeton Township Property Owner:

Your property has been identified as one that has had or potentially could have flood damages. Historic flood damages include those which have occurred during Hurricane Doria (1971), Hurricane Floyd (1999) and/or other significant floods. Princeton Township has a history of flood damages in the Millstone River watershed. Between 1978 and 1999, the National Flood Insurance Program, administered by the Federal Emergency Management Agency (FEMA) had claims for over \$400,000 from property owners in the Township due to flood damage.

As a result, the Township has applied for and received a State Office of Emergency Management grant to fund the development of a Flood Mitigation Plan. The flood mitigation plan will improve the opportunities to receive Federal Emergency Management Agency funding to help property owners avoid or reduce future flood damages. The USDA Natural Resources Conservation Service will be assisting the Township in the development of the Plan.

A public hearing will be held on \_\_\_\_\_ at 7 p.m. at the Princeton Township Municipal Building to receive your input for the development of the flood mitigation plan. A Township Flood Control Committee, which will include representatives of the flooded property owners, Township Engineering and Office of Emergency Management and others, will be formed to guide the Plan development. Please complete the attached brief questionnaire to assist the Township's Flood Control Committee to develop a Flood Mitigation Plan. We encourage you to bring the completed questionnaire with you and to share your concerns and ideas at this meeting.

If you cannot attend the meeting, please return this questionnaire by \_\_\_\_\_ to Mr. Robert Kiser by fax to 609-688-2027 to his attention or by mail to Mr. Robert Kiser, Princeton Township, 400 Witherspoon Street, Princeton, New Jersey 08540-3496. Thank you for your participation in this critical initiative.

Sincerely,

Phyllis L. Marchand  
Mayor

Enclosure

Princeton Township Flood Mitigation Plan  
January 2006

Princeton Township Property Owner Flood Mitigation Survey Questionnaire

Please Print

Name \_\_\_\_\_

Affiliation \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_

Fax \_\_\_\_\_

e-mail \_\_\_\_\_

How long have you owned your property? \_\_\_\_\_

Have you sustained flood damage to your property? If so, please describe the extent of the damage.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

When did the damage occur? \_\_\_\_\_

Did you have flood damages in Hurricane Floyd (1999)?  YES  NO

Did you have flood damages in Hurricane Doria (1971)?  YES  NO

What type of damage occurred?

7. How much did the damage cost you? \$ \_\_\_\_\_

A) Did you have flood insurance at the time  YES  NO

B) Did that help cover some of the costs?  YES  NO

Do you currently have flood insurance?  YES  NO

10. How long have you had flood insurance? \_\_\_\_\_

What suggestions do you have to reduce flood damages in the future\*?

Princeton Township Flood Mitigation Plan  
January 2006

What incentives do you think that Princeton Township, the Federal Emergency Management Agency and others should offer to reduce flood damages?\*

13. Additional comments - \*Please continue on back of this sheet if necessary.

Please return this questionnaire by \_\_\_\_\_ to Mr. Robert Kiser by fax to 609-688-2027 to his attention or by mail to Mr. Robert Kiser, Princeton Township, 400 Witherspoon Street, Princeton, New Jersey 08540-3496. Thank you for your participation in this critical initiative.

Princeton Township Flood Mitigation Plan  
January 2006

Princeton Township Property Owner Flood Mitigation Survey Questionnaire  
Final Results – April 12, 2004

Question 1: How long have you owned your property?

Less than 1 year	=	2
1-5 years	=	16
6-10 years	=	22
11-20 years	=	27
21 + years	=	66
Total	=	133

Question 2: Have you sustained damage to your property due to surface water .....

Yes	=	71
No	=	62
Total	=	133

Question 2a: What type of damage occurred?

Structural Damage	=	4
Damaged Contents	=	19
Flooding	=	54
Erosion	=	46
Other	=	27 (while these answers varied – most mentioned flooding of the basement or damage to fencing)

Question 2b: How much did the damage cost you?

\$0	=	39
\$1.00 - \$500	=	4
\$501 - \$1500	=	8
\$1501 - \$5000	=	11
\$5001 - \$10,000	=	1
\$10,000 or more	=	8
Total	=	71

Question 3a: Did you have flood insurance at the time?

Yes	=	20
No	=	51

Princeton Township Flood Mitigation Plan  
January 2006

Total = 71

Question 3b: Did it help cover some of the costs?

Yes = 8

No = 12

Total = 20

Question 4: Do you currently have flood insurance?

Yes = 22

No = 110

Don't Know = 1

Total = 133

Question 5: If yes, how long have you had flood insurance?

Less than 1 year = 1

1-5 years = 6

6-10 years = 4

11-20 years = 5

21 + years = 6

Total = 22

Princeton Township Flood Mitigation Plan  
January 2006

Open-Ended Questions

Question 6: What suggestions do you have to address flood damages in the Twp.....

No Answer/None	=	79
Those with answers	=	54 (see below)
Total	=	133

Question 7: Additional Comments:

No Answer/None	=	72
Those with answers	=	61 (see below)
Total	=	133

Question 6: (if answers were duplicated, they were not recorded twice)

I can only speak for my property – that is adjacent to Harry’s Brook in my backyard. When there is torrential rain, water carried from upstream flood over the banks and into properties. To address the problem, we need to widen or deepen this section of the creek and reinforce the banks to allow water to flow downstream and prevent further erosion. All of which is beyond property owners’ means to address.

I own lots 17 & 18 in block 901 since the early 1960’s and the water has never gone over the pipe we installed in the 60’s.

Site limitations on use of blacktop and other non-permeable paving

Prevent leakage from the drainage pipes that go across the property that are used to drain the road

Lake Drive will be re-done soon as well as Knoll Drive. If they get the reconstruction right, it may help

I really don’t know

Since the bike path was added to our section of Mercer Road, I think the drainage in front of our house has gotten worse. I don’t think the drainage “improvements” have reduced flooding.

A curb could be helpful to stem the flow of water toward the house

Fix the “impromptu” stream situations

Adequate culvert drainage for the 100 yr storm.

Dredge the Stony brook so heavy rains do not create a lake effect on my property.

New construction should have porous driveways – more restrictions on increasing the footprints of existing buildings to restrict extra run-off

Prevent over-development which would affect our stream.

Problem1-Flash flooding of Mountain Brook – Dredge, reroute stream and build berm to contain flood to south east side; Problem2- Flooding Stony Brook; dredge and clear floodway

Princeton Township Flood Mitigation Plan  
January 2006

Luckily the flooding of the yard on Harry's Brook did not reach the house – which was my main concern – but the yard was left in miserable condition

Make sure that further development does not hinder absorption of rainwater. Avoid too much paving in the watershed

Additional storm sewers on Snowden Lane; high curbs along the street; sidewalk at driveway entrance raised and slanted towards the street

Keep Stony Brook (and flood plain) clear

The flooding problem will not go away. I think it is necessary to find out what it would cost to do the most complete flood control job, even if it does not appear to be economically feasible. We shouldn't approach this with preconceived notions about budget limitations

I will defer to your Engineers and Township reported culvert work in progress

Please do not do anything that would increase our cost of living here. To label our property in a flood plain is unbelievable

Keep storm drains open. In front of my house I have done this job for 54 years

It is imperative to keep the waterways free of debris and fallen trees. This preventative measure can reduce future flood damages – The township should help restore, expeditiously, excessive soil erosion – I feel one day our backyards are going to look like an abandoned streambed

Berm the curving roads when or as the roads are being paved

Couple each development with a detainment basin

Don't build on flood plains

Limit further construction around streams and provide appropriate run-off drains where needed to prevent flooding in the future

Individuals upon purchase of the property, should know the probability of a flood occurring on that property. Hence they are responsible for obtaining flood insurance

Better planning by Township of permits to develop lands

Stop development on the Stony Brook. Stop paving all driveways and parking

While we do not have a stream behind our house it is 20-30 feet below the level of our home

Rigidly enforce out flood control and stream corridor ordinances. Over development and inattention to development controls on wetlands are the underlying causes of Princeton's flood problem. Give more variances to build on wetlands

Limit new impervious cover in watershed and require new owners/developers to manage increased run-off on-site.

No Idea

Allow refilling of eroded areas

To reinforce the sides of Harrison Brook and to widen the channel under Roper Road bridge to facilitate water flow

Unlike any of my neighbors on Bertrand Drive and Dodds Lane, we do not have flood/water problems. As you know trees play a very important role in preventing floods. Do not consider development, parks, or roads that would result in destruction of trees in any flood sensitive area of Princeton

Do not clear any land (cut trees) by Smoyer Park

Enforce requirements for detention/retention ponds in developments and parking areas

Princeton Township Flood Mitigation Plan  
January 2006

At Route #27 and Harrys Brook the brook continually fills with dirt, leaves branches and garbage presumably causing a backup due to slower output into Carnegie Lake  
Annual site checks to determine future flood issues or problems before they happen  
Only occurred once during the worst flood. Flood insurance is a good alternative  
Our neighbors just removed hundreds of trees, how could the Township allow such a thing !! They removed trees in a flood plain, shame on the ordinance. Removal of thus to this extent should not be allowed, it causes runoff.

Alter grading so all water flows into the Borough

Disallow loss of surfaces that absorb water. Keep a watchful eye on the dam – does it control water flow in the lake?

Clean up and maintain old basins (three water retainers were abandoned along Thanet Road)

Adjust/modify water inlet in the newer basins (to elevate water level and increase capacity)

Major dredge of the brook from garage and build up, followed by routine maintenance  
Repair the damage done to the banks of the brook (i.e. washed away soil, exposed manhole, etc.) and construct “stonewall” to prevent future damage (as done by Princeton Borough)

Replace/adjust culvert to allow better water flow. At the corner of Braeburn Dr. \* Meadowbrook Dr. – the pipes openings are too small. They are also falling apart. Under Thanet Road – the pipes orifices are too high above water level. Water cannot flow through – even under flood conditions.

Stop any development (especially at the Shopping Center); improvement/expansion of existing building, new construction, driveway and parking lot or any other “ground cover” structures.

Convert unused, low open space areas to new water basin (side section of the park, next to Grove Ave., between the medical center and the corner of Thanet Road & Terhune Road etc.).

Land development in the area is not well controlled. Our water problem has grown increasingly worse over the years as houses and buildings are erected in the area.

Through a study as you propose.

It is a complex problem and there is no quick fix for it. The experts need to examine the long range disturbance up stream and regulate accordingly as well as aid in the present situation.

Control of development; innovative measures for return of rain water, roof run-off to soil & ground; for example =, roof run-off to dry-wells; improve stormwater controls

Storm drains on Snowden are blocked. MUST be cleared. As it stands all water from North direction on Snowden flows into Rollingmead.

Move out of the flood plane.

In nearly 30 years we have lived in the Kingston Mill ( at 1113 Princeton-Kingston Road), we have observed that there seems to be a change in the pattern of floods: during a flood, the water seems to generally rise more slowly and, after the peak, the water seems to recede more slowly. While we attribute this to the concurrent implementation of increased storm water detention requirements throughout the Stony Brook-Millstone basin, we have no data to prove it. We strongly support storm water detention systems and the maintenance necessary to maintain them.

Princeton Township Flood Mitigation Plan  
January 2006

During not only the 30 years in which we have lived in the Kingston Mill, but also within the memory of previous owners (in particular the Pierces and the last miller Matthew Suydam) and what we have been able to determine from historic photographs, the flood that resulted from Hurricane Floyd was the only one to produce water (about 1' – 3") on the first floor. Only once before (during the early 1970's) had there been water on the deck (about 6" below the first floor). Both of the storms occurred after the construction of the new Route 27 bridge in the late 1960's. In both cases the flood capacity of the bridge (and the pedestrian tunnel under Route 27) was reached and the water continued to rise until it was able to flow over embankment of the portion of the Route 27 relocated in the construction of the new bridge. An increase in the flood capacity of the bridge, or more likely, the road embankment (which serves as a dike) could improve our situation.

Within Princeton Township especially, but also within other communities, we are concerned about the addition of impervious coverage (e.g. houses, tennis courts, pools, paved surfaces) particularly on individual single-family lots from which most, if not all, storm water detention requirements do not apply. The increase in "tear-downs" and the subsequent building of larger houses in their stead makes this a greater issue. Increased regulations, particularly in the vicinity of streams, could help reduce the problem.

In addition, we remain very concerned that proposals to build flood control dikes in the Manville and Zarepath areas that would drastically narrow the floodway in those areas will exacerbate flooding upstream.

Question 7: (if answers were duplicated, they were not recorded twice)

The house was built on this property in 1939, to the best of our knowledge, no damage has occurred

I am also concerned about the health hazard caused by flooding. Debris and sometimes dead animals and birds were washed up to the yard

I have pictures of some of the worst storms and the water did not go over the stream bank or pipe

The flow from up the road continues to worsen when it rains. The standing water before the bridge becomes the bigger problem; potential skidding if frozen, hydroplaning and mosquito haven. Note some erosion on the other side of bridge – an accident waiting to happen

Because of the leakage in the pipes one water table has been high and has damaged the basement well and resulted in sump pump burnout

Thank you for addressing this serious problem

Our mailbox needs to be moved farther from the road. It now sits in the gully by the side of the road which is often full of water after a rainstorm or melting snow. The wooden post will quickly rot out. Before the road was widened, our mailbox was on "high" ground. I'll be in touch regarding this matter

We had considerable damage recently when our sump pump failed and a foot of water flooded our basement

Don't make it worse

Princeton Township Flood Mitigation Plan  
January 2006

I would like to be informed about this flood mitigation plan when it is established  
I have never had a wet basement nor do I think that previous owners ever had any problems because it is a finished basement. The way my property is; my lower area has the stream and is kept in a pretty natural state. The house is on the hill where no flooding ever can occur.

I have enclosed current photos of present status of my property affected. I have to have a commercial chipper come every spring to clear property of flood debris – entire trees end up on hunt farm – must be cut up and removed (photo's are located in survey folder)  
The creek running through our property constantly floods lower garden and banks are eroding badly – stream bank restoration would help during the last 24 years clean up along the banks of this section has only happened once about 22 years ago

I hired a lawn company to take care of the miserable condition of the property and it still is not up to par. Often the flooding is caused by big branches or debris blocking the flow of the water – When I notice it I immediately call your office – but what if I wasn't here?  
We do not need flood insurance

Katherine Reed Ellington the former owner also claimed no flooding between 1941 and 1979

“Rip-wrapping” the shoreline of Stony Brook would be prohibitive for the Township and residents. Stony Brook which does not relieve us, unfortunately, insurance cannot replace one-of-a-kind destroyed items.

We are 125' above sea level and 50+' above Stony Brook. Half of Mercer County would be under before us.

My damage has been from heavy rainstorms that couldn't be carried away. While my husband lived, we considered flood insurance but it was a national thing and our policy (more than we could afford) had a premium to help the people of areas in our country that are traditionally flood prone.

Our land is saturated because of excessive water runoff. The rain water then seeps through foundations. We also get flooded when the rain water runoff floods the stream and backs up to our garage. Our house is some 250 feet away from the stream bank. Our town needs to impose very strict rules when it comes to allowing further development along the Harry's Brook Basin or along areas that drain into Harry's Brook. Harry's Brook has not been able to contain rain water runoff for years. But since the drought season ended, the flooding conditions are no longer related to Hurricane only. The properties along the basin are getting flooded every month. The more we crowd the land with buildings the greater the damage to an already intolerable situation

Our house is about 15' above flood level and in any case, the main level is 10' higher. This is successful at my address except for a real except for a real cloud burst when the water is soon dispersed and flows on into the lake level.

Before hurricane Doria we had only a small culvert (36") to carry Harry's Brook by our land. After this flood, twice in 1 day we were we were finally successful in having the County construct a single lane bridge over the brook at the cul-de-sac end of Locust Lane.

Our house is dry – it is built high

Is this really a problem? Why not fix the potholes?

My house is well elevated from the floodline.

Princeton Township Flood Mitigation Plan  
January 2006

Stony Brook has lost most of its floodplain due to over-development and poor building and too much asphalt paving. How about limiting the square feet of asphalt permissible per development (like PondView)? What's wrong with old-fashioned gravel? Runoff controls are needed.

Acquire as protected open space wetlands, stream corridors and drainage lands with open space tax monies and D&R Greenway assistance, Mercer County and NJ Green Trust monies.

Be aware of the damage of rapidly moving flood waters.

Maintain drainage (easement) ditch from Terhune/Van Dyke behind Meadowbrook. Be very weary of downstream effects of development n/w above Terhune. Provide technical advice to property owners in drainage/stream corridors about feasible individual property drainage improvements.

There is absolutely no problem with water runoff or drainage on my property.

From what I understand, flooding is a natural part of weather. If people live near a stream they ought to expect flooding. I would be very concerned if efforts were made to control flooding which resulted in an unbalancing of the eco-system, as has happened in many rivers.

Our property is low only on the far right side and far left side. The house and pool are well elevated. Stony Brook has not exceeded its floodplain on our side of the stream since that one storm.

Cannot imagine a flood actually approaching the house although could certainly reach a lower part of the yard.

Although our property is in a flood zone, due to its elevation, the house is not.

We have a stream on our property that runs under a main sewer line through two culverts. These culverts need to be cleared of debris every few months. When I was younger, I used to keep the culvert clear. I've asked the Township Engineering to do this regularly, but they don't seem to do this. They came exactly once, but it needs regular attention.

Advise homeowners that heavy rains raise the water table even for streams. Be sure sump pumps are working. Suggest generator to run pump if power fails. (Do not run it indoors).

Drainage of water from Maybury Hill is excessive, need basin. Please do something or call.

Currently the creek in my backyard is getting wider due to erosion of land from overflowing during heavy rains and snowfall.

I don't think there has been any "damage" other than rare flooding of the front yard and limited access due to road closures.

Run off from adjacent properties – not stream.

The previous owner has Floyd problems. The water rose all the way to the swimming pool. He had to drain, clean and repaint. Also he installed plugs for generator to pump water out of basement

See 59 Meadowbrook Drive file in the Engineering Department

Should help through the Township be available for landscaping to replace soil that has run off into Stony Brook and to help us with the problem of water pooling, we would welcome it.

This problem began about 2 or 3 years ago; before that, everything seemed fine.

Princeton Township Flood Mitigation Plan  
January 2006

There has been a lot of snow and rain since we moved into this house. The Brook often is very high. I can see how this could erode our yard/bank of the stream. How is this dealt with? Do we need flood insurance? Is the Township responsible for maintaining eroding banks? Since the property is "in essence" the Townships, they should be the ones to maintain it.

I am leaving copies of this information for the new owner

I hope that some experts come and examine the problem at every problem property and help to remedy the problem.

I believe that damage along lower Harrys Brook from storm events is getting worse at an increasing rate.

The DOT in conducting their "survey" damaged most of the trees on Arreton Road – They are people to be avoided – Hurricane can't be prevented but the DOT should be Storm drains in front of each house not at low point if street so my yard gets flooded when there is lots of rain. Township engineers told previous owner she could remove exalating culvert; bad advice since we get a stream there from the street's low point.

**Letter to Neighboring Municipalities, State and County Agencies**

Princeton Township Flood Mitigation Plan  
January 2006

November 30, 2004

Mr. Kenneth Daly, Township Manager  
Franklin Township  
475 DeMott Lane  
Somerset, NJ 08873

RE: Township of Princeton  
Flood Mitigation Plan

Dear Mr. Daly,

This is to advise you that the Township of Princeton is in the process of developing a Flood Mitigation Plan funded by the grant from the Federal Emergency Management Agency (FEMA) through the State Office of Emergency Management. The Natural Resources Conservation Service will be providing planning assistance to the Township to complete the Plan.

We are providing this notification so as not to duplicate or interfere with other flood plain management activities nearby and ask that you advise us of any activity, either proposed or in place, which may impact on our Plan and its implementation.

Your response to this request by no later than December 31, 2004 will be appreciated.

Thank you for your anticipated cooperation.

Robert V. Kiser, PE  
Township Engineer

RVK/cc

c: Princeton Township Flood Control Commission  
Greg Westfall, Water Resources Planner, USDA-NRCS

Princeton Township Flood Mitigation Plan  
January 2006

December 15, 2004

Mr. Robert V. Kiser, PE  
Township Engineer  
Princeton Township  
400 Witherspoon Street  
Princeton, New Jersey 08540-3496

Dear Bob:

I received your letter, dated November 30, 2004, regarding the Flood Mitigation Plan that Princeton is pursuing. The Township of Montgomery currently is reviewing options that include warning signs on those roads leading to the Griggstown Causeway indicating its closure, the acquisition of residential properties prone to flooding, and/or the possibility of elevating residential properties subject to flooding so as to protect damage to the living areas. None of the aforementioned items should have any impact on Princeton Township's plans.

Should you have any questions please feel free to contact my office.

Sincerely,

Donato Nieman  
Township Administrator

c: Greg Westfall, Water Resources Planner, USDA-NRCS

## **Comments Received From Others**

Princeton Township Flood Mitigation Plan  
January 2006

Princeton Township Flood Mitigation Plan  
January 2006



Richard J. Codey  
Acting Governor

State of New Jersey  
Department of Environmental Protection  
Natural and Historic Resources  
Office of Engineering & Construction

Bradley M. Campbell  
Commissioner

DEC 08 2004

Mr. Robert V. Kiser  
Princeton Township Engineer  
400 Witherspoon Street  
Princeton, NJ 08540-3496

Re: Princeton Township, Mercer County

Dear Mr. Kiser:

I am writing in response to your November 30, 2004 letter advising that Princeton Township is developing a Flood Mitigation Plan. The development of Flood Mitigation Plans by several municipalities in the Millstone River basin, that have experienced recent damaging flooding, is a positive result of the joint study of the Millstone River basin by the U.S. Army Corps of Engineers, New York District and the U.S. Department of Agriculture, Natural Resources Conservation Service.

This study began soon after the record flooding of September, 1999 and continues. The Millstone River Basin Study Steering Committee meets quarterly to coordinate study efforts, to share the data collected or developed during the study and to avoid duplication of effort.

It should, however, be noted that the Federal Emergency Management Agency (FEMA) under the National Flood Insurance Program Map Modernization Program will in the near future restudy the Millstone River from its mouth upstream to the Carnegie Lake Dam and revise the floodway and flood hazard area limits and Base Flood Elevations (BFEs). The agencies involved in the Millstone River basin study are, however, working together to develop a single hydraulic model of the river thereby avoiding duplication of effort.

I am not aware of any other activity that could effect your flood mitigation plan.

Very truly yours,

Clark D. Gilman, P.E.  
Section Chief  
Flood Plain Management Section

c: Greg Westfall, NRCS  
File

E-Mail Address: DamSafety@dep.state.nj.us  
Internet Address: www.state.nj.us/dep/damsafety  
Mailing Address: 501 East State Street, P.O. Box 419, Trenton, NJ 08625

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Princeton Township Flood Mitigation Plan  
January 2006

05/10/2005 10:29 609-688-2026

PRINCETON TWP ZONING

PAGE 02/03

Claudia  
FCC

# Franklin Township

*A Proud Somerset County Community*

LAND USE/ENGINEERING

December 13, 2004

Robert V. Kiser, PE  
Township Engineer  
Township of Princeton  
404 Witherspoon Street  
Princeton, NJ 08540-3496

Re: Township of Princeton  
Flood Mitigation Plan



MUNICIPAL BUILDING  
475 DEMOTT LANE  
SOMERSET, N.J. 08873-6704

TEL. (732) 873-2500  
FAX (732) 873-1059

Dear Mr. Kiser:

I am in receipt of a copy of your letter to Kenneth Daly, Township Manager dated 11/30/2004 requesting information about the Township of Franklin's Flood Mitigation Plan. The Township of Franklin has a flood mitigation plan that was developed with the assistance of Greg Westfall of the USDA-NCRS. Outside of this plan the Township has no existing or proposed flood plain activities that may impact Princeton Township's plan or implementation. Should you have any further questions or require any further information, please do not hesitate to contact me at 732-873-2500 ext 232.

Sincerely,

Tom Zilinek, PE, CME  
Township Engineer/Director  
Department of Public Works

cc: Kenneth W. Daly, Township Manager

A HISTORIC PAST - A GROWING FUTURE UNDER COUNCIL MANAGER GOVERNMENT

Princeton Township Flood Mitigation Plan  
January 2006

05/10/2005 10:29

609-688-2026

PRINCETON TWP ZONING

PAGE 03/03



*Claudia*

DONATO NIEMAN  
Township Administrator

Municipal Building  
2261 Van Horne Road  
(Route 206)  
Belle Mead, New Jersey 08502  
Tel (908) 359-8211  
Fax (908) 359-4402  
TDD (908) 359-8211

December 15, 2004

Mr. Robert V. Kiser, PE  
Township Engineer  
Princeton Township  
400 Witherspoon Street  
Princeton, New Jersey 08540-3496

Dear Bob:

I received your letter, dated November 30, 2004, regarding the Flood Mitigation Plan that Princeton is pursuing. The Township of Montgomery currently is reviewing options that include warning signs on those roads leading to the Griggstown Causeway indicating its closure, the acquisition of residential properties prone to flooding, and/or the possibility of elevating residential properties subject to flooding so as to protect damage to the living areas. None of the aforementioned items should have any impact on Princeton Township's plans.

Should you have any questions please feel free to contact my office.

Sincerely,

  
Donato Nieman  
Township Administrator

c: Greg Westfall, Water Resources Planner, USDA-NRCS



**Preliminary Damage Assessment Report and Emergency Log for  
Hurricane Floyd in Princeton Township**

Princeton Township Flood Mitigation Plan  
January 2006

**Hurricane Floyd Flooding Preliminary Damage Assessment**

<u>Sector</u>	<u>Estimated Total Loss</u>
Private Sector:	
Three single family homes received major damage and 31 homes received minor damage.	\$150,000.
Public Sector:	
Emergency Protective Measures	
Police	\$6,015.
Public Works	\$5,617.
Road Systems	\$100,000.
Road washouts at Quaker Road, Mercer Road, Brookstone Drive and other locations	
Water Control Facilities	
Princeton Sewer Operating Committee	\$20,000.
Four pump stations damaged	
Public Buildings and Equipment	
Princeton Regional School	\$100,000.
Truck repair, water testing, JP outdoor science trail, PHS computer system, side walk, athletic equipment, parking bumper replacement, waterless hand sanitizer, computer software - hardware reconfiguration, overtime salaries, etc.	
First Aid & Rescue Squad	\$9,755.
Fire	\$26,370.
<b>TOTAL ESTIMATED LOSS</b>	<b>\$417,757.</b>

Princeton Township Flood Mitigation Plan  
January 2006

Township of Princeton Office of Emergency Management September 16 - 17, 1999				
INCOMING CALL TO:	DA TE	TIME	LOCATION	REASON
Fire	16-Sep	3:46 PM	37 Pheasant Hill Road	Water in basement/furnace exposed
Fire	16-Sep	3:47 PM	9 Hilltop Road	Water in basement
Fire	16-Sep	4:00 PM	15 St. Clair Court	Water in basement
Fire	16-Sep	4:01 PM	15 Newlin Road	Water in basement
Fire	16-Sep	4:10 PM	9 Kimberly Court	Water in basement
Police	16-Sep	4:23 PM	Mercer Street/Lovers Lane	Barricades needed
Fire	16-Sep	4:34 PM	617 Brickhouse Road	Water in basement
Fire	16-Sep	5:01 PM	3 Campbell Woods Way	Water in basement
Police	16-Sep		Mansgrove at State/Terhune at Governors	Flooded roads
Fire	16-Sep	5:11 PM	3 Puritan Court	Water in basement
Lt. Davall	16-Sep	5:20 PM	Princeton High School	Need another pump for flooding
Fire	16-Sep	5:33 PM	140 Quaker Road	Water in basement
Fire	16-Sep	5:35 PM	173 Mansgrove Road	Water in basement
Lt. Davall	16-Sep	5:45 PM	Princeton High School	Losing flood battle - requesting assistance
Fire	16-Sep	6:02 PM	5 Andrews Lane	Water in basement
Fire	16-Sep	6:03 PM	230 Birch Avenue	Water in basement
Fire	16-Sep	6:03 PM	912 Cherry Valley Road	Water in basement
Public Works	16-Sep	6:11 PM	State Road	Debris in road
EMS	16-Sep		168 Alexander Street	Water in basement
Public Works	16-Sep	6:13 PM	Russell Road	Tree down blocking road
First Aid/Police/Fire Department	16-Sep	6:17 PM	Lake Carnegie	Water rescue - swimmers in lake
Police	16-Sep	6:23 PM	Clover Lane	Flooded
Lt. Buchanan	16-Sep	6:25 PM	Terhune Road/Dempsey Avenue	Flooded-barricades requested
Fire	16-Sep	6:38 PM	215 Bayard Lane	Water in basement

Princeton Township Flood Mitigation Plan  
January 2006

Township of Princeton Office of Emergency Management September 16 - 17, 1999				
INCOMING CALL TO:	DA TE	TIME	LOCATION	REASON
Lt. Buchanan	16- Sep	6:39 PM	332 Riverside Drive	Wires sparking on wires
Fire	16- Sep		56 Balcord Drive	Water in basement
Lt. Buchanan	16- Sep	6:43 PM	Alexander at Canal Broadripple/Overbrook Rosedale Road	Roads closed
Fire	16- Sep	6:44 PM	27 Walker Drive	Needs power turned off
Public Works	16- Sep	6:45 PM	Princeton High School	Front end loader needed
	16- Sep	6:47 PM	Faculty Road/Alexander Road	Barricades or Fire/Police needed to close road
Lt. Davall	16- Sep	6:50 PM		Barricades needed
Fire	16- Sep	6:52 PM	33 Woodland Drive	Water in basement
Fire	16- Sep	7:03 PM	566 Princeton Kingston Road	Water in basement
Police	16- Sep	7:05 PM	Rosedale Road	Barricades requested
EMS	16- Sep	7:05 PM	Route 518 West of Route 206	Requesting boat assistance for rescue
Public Works	16- Sep	7:07 PM	Woodside Drive	Tree limb down partially blocking road
Public Works	16- Sep	7:08 PM	Linwood Drive	Tree limb down blocking roadway
Police	16- Sep	7:13 PM	Route 27 at River Road	Flooded - barricades needed
Fire	16- Sep	7:22 PM	37 Fitch Way	Water flooding house up to first floor
Fire	16- Sep	7:23 PM	3 Puritan Court	Water in basement
Public Works	16- Sep	7:32 PM	Princeton High School	Front end loader needed
Public Works	16- Sep	7:35 PM	Route 206	Route 206 open - wires/tree removed
Public Works	16- Sep	7:30 PM	Alexander Road/Faculty Road	Lighted barricade needed - light out
Lt. Buchanan	16- Sep	7:35 PM	South Harrison Street	Flooded - road needs closure
Fire	16- Sep		25 Birch Avenue	Water in basement
Fire	16- Sep	7:40 PM	Rosedale Road/Provinceline Road	Need fire and police to stop motorists
EMS	16- Sep	7:45 PM	Near Johnson Park School	Report of 2 men on roof of pickup truck
EMS	16- Sep		Rosedale Road/Johnson Park School	Rescue of 2 men on roof of pickup in water
EMS	16- Sep		Jan-Ray Deli - State Road	Cot needed for patient of recent surgery
Township of Princeton Office of Emergency Management September 16 - 17, 1999				

Princeton Township Flood Mitigation Plan  
January 2006

INCOMING CALL TO:	DATE	TIME	LOCATION	REASON
Fire	16-Sep	7:47 PM	179 Brookstone Drive	Water in basement
Fire	16-Sep		438 Wendover Drive	Water in basement
PSE&G	16-Sep	8:15 PM	186D Spruce Circle	Transformer explosion
Fire	16-Sep	8:28 PM	24 Roper Road	Water in basement
Fire	16-Sep	8:28 PM	21 Adams Drive	Water in basement
Fire	16-Sep	8:30 PM	Cherry Valley Road	Wires down
Fire	16-Sep	8:35 PM	1 North Road	Water in basement
PSE&G	16-Sep	8:40 PM	31 Pardoe Drive	Wires arcing
PSE&G	16-Sep	8:43 PM	Cherry Valley Road/Heather Lane/Great Road	Wires across roadway
Police/Fire/Public Works	16-Sep	8:49 PM	387 Gallup Road	Foundation wall collapsed
Fire	16-Sep	8:55 PM	387 Gallup Road	Basement wall collapsed
Fire	16-Sep	9:05 PM	83 Winfield Road	Water in basement
Police	16-Sep	9:20 PM	Alexander Street by Canal	2 explosions reported
Fire	16-Sep	9:21 PM	713 Prospect Avenue	Water in basement
Fire	16-Sep	9:24 PM	1075 Great Road	Carbon monoxide alarm
Fire	16-Sep	9:30 PM	713 Prospect Road	Water in basement
Fire	16-Sep	9:42 PM	Princeton Medical Center	Fire alarm in Lambert House
Fire	16-Sep	10:15 PM	390 Gallup Road	Shelter needed for evacuation victims
Fire	16-Sep	10:30 PM	1 North Road	Water in basement - situation worsened
Fire	17-Sep	12:15 AM	Harrison/Southern Way	Waited for PSE&G
Fire	17-Sep	12:41 AM	829 Princeton Kingston Road	Slab - no basement

## **Princeton Township Flood Damage Prevention Ordinance**

Princeton Township Flood Mitigation Plan  
January 2006

CHAPTER 9A. FLOOD DAMAGE PREVENTION.

- § 9A-1. Statutory authorization, findings of fact, purpose and objectives.
- § 9A-1.1. Statutory authorization.
- § 9A-1.2. Findings of fact.
- § 9A-1.3. Statement of purpose.
- § 9A-1.4. Methods of reducing flood losses.
- § 9A-2. Definitions.
- § 9A-3. General provisions.
- § 9A-3.1. Lands to which this chapter applies.
- § 9A-3.2. Basis for establishing the areas of special flood hazard.
- § 9A-3.3. Penalties for noncompliance.
- § 9A-3.4. Abrogation and greater restrictions.
- § 9A-3.5. Interpretation.
- § 9A-3.6. Warning and disclaimer of liability.
- § 9A-4. Administration.
- § 9A-4.1. Establishment of development permit.
- § 9A-4.2. Designation of the administrative officer.
- § 9A-4.3. Duties and responsibilities of the administrative officer.
- § 9A-4.3-1. Permit review.
- § 9A-4.3-2. Use of other base flood data.
- § 9A-4.3-3. Information to be obtained and maintained.
- § 9A-4.3-4. Alteration of watercourses.
- § 9A-4.3-5. Interpretation of FIRM boundaries.
- § 9A-4.4. Variance procedure.
- § 9A-4.4-1. Appeal board.
- § 9A-4.4-2. Conditions for variances.
- § 9A-5. Provisions for flood hazard reduction.
- § 9A-5.1. General standards.
- § 9A-5.1-1. Anchoring.
- § 9A-5.1-2. Construction methods and materials.
- § 9A-5.1-3. Utilities.
- § 9A-5.1-4. Subdivision proposals.
- § 9A-5.1-5. Enclosure openings.
- § 9A-5.2. Specific standards.
- § 9A-5.2-1. Residential construction.
- § 9A-5.2-2. Nonresidential construction.
- § 9A-5.2-3. Manufactured homes.
- § 9A-5.3. Floodways.

Sec. 9A-1. Statutory authorization, findings of fact, purpose and objectives.

Sec. 9A-1.1. Statutory authorization.

Princeton Township Flood Mitigation Plan  
January 2006

The legislature of the State of New Jersey has in N.J.S.A. 40:48-1 et seq. and N.J.S.A. 40:55D-1 et seq. delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety and general welfare of its citizenry. Therefore, the township committee of Princeton, New Jersey does ordain as follows: (Ord. No. 84-32, § 9A-1.)

Sec. 9A-1.2. Findings of fact.

(a) The flood hazard areas of Princeton Township are subject to periodic inundation which results in 1055 of life and property, health and safety hazards, disruption of commerce and govern-mental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.

(b) These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated or otherwise protected from flood damage also contribute to the flood loss. (Ord. No. 84-32, § 9A-1.)

Sec. 9A-1.3. Statement of purpose.

It is the purpose of this chapter to promote the general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- (a) To protect human life and health;
- (b) To minimize expenditure of public money for costly flood control projects;
- (c) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public.
- (d) To minimize prolonged business interruptions;
- (e) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
- (f) To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;
- (g) To insure that potential buyers are notified that property is in an area of special flood hazard; and,
- (h) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

(Ord. No. 84-32, § 9A-1.)

Sec. 9A-1.4. Methods of reducing flood losses.

In order to accomplish its purposes, this chapter includes methods and provisions for:

- (a) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
- (b) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

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- (c) Controlling the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
  - (d) Controlling filling, grading, dredging, and other development which may increase flood damage; and
  - (e) Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazard in other areas.
- (Ord. No. 84-32, § 9A-1.)

Sec. 9A-2. Definitions.

Unless specifically defined below, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.

"Appeal" shall mean a request for a review of the administrative officer's interpretation of any provision of this chapter or a request for a variance.

"Area of shallow flooding" shall mean a designated AO Zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate and velocity flow may be evident.

"Area of special flood hazard" shall mean the land in the flood plain within a community subject to a one percent or greater chance of flooding in any given year.

"Base flood" shall mean the flood having a one percent chance of being equaled or exceeded in any given year.

"Basement" shall mean any area of the building having its floor subgrade (below ground level) on all sides.

"Breakaway wall" shall mean a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces without causing damage to the elevated portion of the building or supporting foundation system.

"Development" shall mean any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations located within the area of special flood hazard.

"Elevated building" shall mean a non-basement building (i) built in the case of a building in an area of special flood hazard to have the top of the elevated floor or in the case of a building in a coastal high hazard area to have the bottom of the lowest horizontal structural member of the elevated floor elevated above the ground level by means of piling, columns (posts and piers), or shear walls parallel to the flow of the water and (ii) adequately anchored so as not to impair the structural integrity of the building during a flood of up to the magnitude of the base flood. In an area of special flood hazard "elevated building" also includes a building elevated by means of fill or solid foundation perimeter walls with openings sufficient to facilitate the unimpeded movement of flood waters. In areas of coastal high hazard "elevated building" also includes a building otherwise meeting the definition of "elevated building" even though the lower area is enclosed by means of breakaway walls.

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"Flood" or "flooding" shall mean a general and temporary condition of partial or complete inundation of normally dry land areas from:

- (a) The overflow of inland or tidal waters; and/or
- (b) The unusual and rapid accumulation or runoff of surface waters from any source.

"Flood Insurance Rate Map" FIRM shall mean the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

"Flood Insurance Study" shall mean the official report provided in which the Federal Insurance Administration has provided flood profiles, as well as the Flood Boundary-Floodway Map and the water surface elevation of the base flood.

"Floodway" shall mean the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than 0.20 foot.

"Lowest floor" shall mean the lowest floor of the lowest enclosed area (including basement). A unfinished or flood resistant enclosure, usable solely for the parking of vehicles, building access or storage in an area other than a basement is not considered a building's lowest floor, provided that such enclosure is not built so to render the structure in violation of the applicable nonelevation design requirements.

"Manufactured home" shall mean a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For flood plain management purposes the term "manufactured home" also includes park trailers, travel trailers and other similar vehicles placed on a site for greater than 180 consecutive days. For insurance purposes the term "manufactured home" does not include park trailers, travel trailers and other similar vehicles.

"Manufactured home park or manufactured home sub-division" shall mean a parcel (or contiguous parcels) of land subdivided into two or more manufactured home lots for rent or sale.

"New construction" shall mean structures for which the "start of construction" commenced on or after the effective date of this chapter.

"Start of construction" (for other than new construction or substantial improvements under the Coastal Barriers Re-sources Act P.L. 97-348) shall include substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction placement, or other improvement was within one hundred eighty days of the permit date. The actual start shall mean either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling nor does it include the installation of streets and/or walkways, nor does it include excavation for a basement, footings, piers or foundations or the erection of temporary forms, nor does it include the installation on the property of accessory buildings; such as garages or sheds not occupied as dwelling units or not part of the main structure.

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“Structure” shall mean a walled and roofed building, a manufactured home, or a gas or liquid storage tank, that is principally above ground.

“Substantial improvement” shall mean any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds fifty percent of the market value of the structure either:

- (a) Before the improvement or repair is started; or
- (b) If the structure has been damaged and is being restored, before the damage occurred.

For the purposes of this definition “substantial improvement” is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term does not, however, include either:

- (1) Any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions; or
- (2) Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

“Variance” shall mean a grant of relief from the requirements of this chapter which permits construction in a manner that would otherwise be prohibited by this chapter. (Ord. No. 84-32, § 9A-2; Ord. No. 87-4, §§ 1, 9; Ord. No. 88-19, § 1.)

Sec. 9A-3. General provisions.

Sec. 9A-3.1. Lands to which this chapter applies.

This chapter shall apply to all areas of special flood hazards within the jurisdiction of Princeton Township. (Ord. No. 84-32, § 9A-3)

Sec. 9A-3.2. Basis for establishing the areas of special flood hazard.

The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled “The Flood Insurance Study for the Township of Princeton”, dated June 4, 1984, or (either/or) the most current FEMA FIS and any revisions hereto with accompanying Flood Insurance Rate Maps and Flood Boundary-Floodway Maps is hereby adopted by reference and declared to be a part of this chapter. The Flood Insurance Study is on file at the Princeton Township Engineer’s Office, 369 Witherspoon Street, Princeton, New Jersey. (Ord. No. 84-32, § 9A-3)

Sec. 9A-3.3. Penalties for noncompliance.

No structure or land shall hereafter be constricted, located, extended, converted, or altered without full compliance with the terms of this chapter and other applicable regulations. Violation of the provisions of this chapter by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this chapter or fails to comply with any of its requirements shall upon conviction thereof be fined not more than five hundred dollars or imprisoned for not more than ninety days, or both, for each violation, and in addition shall pay all costs and expenses involved in the

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case. Nothing herein contained shall prevent Princeton Township from taking such other lawful action as is necessary to prevent or remedy any violation. (Ord. No. 84-32, § 9A-3)

Sec. 9A-3.4. Abrogation and greater restrictions.

This chapter is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this chapter and other ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail (Ord. No. 84-32, § 9A-3)

Sec. 9A-3.5. Interpretation.

In the interpretation and application of this chapter all provisions shall be:

- (a) Considered as minimum requirements;
- (b) Liberally construed in favor of the governing body, and
- (c) Deemed neither to limit nor repeal any other powers granted under state

statutes.

(Ord. No. 84-32, § 9A-3)

Sec. 9A-3.6 Warning and disclaimer of liability.

The degree of flood protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This chapter does not imply that land outside the area of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This chapter shall not create liability on the part of Princeton Township, any officer or employee thereof or the Federal Insurance Administration, for any flood damages that result from reliance on this chapter or any administrative decision lawfully made thereunder. (Ord. No. 84-32, § 9A-3)

Sec. 9A-4. Administration.

Sec. 9A-4.1. Establishment of development permit.

A development permit shall be obtained before construction or development begins within any area of special flood hazard established in section 9A-3.2. Application for a development permit shall be made on forms furnished by the administrative officer and may include, but not be limited to; plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; and the location of the foregoing. Specifically, the following information is required:

- (a) Elevation in relation to mean sea level, of the lowest floor (including basement) of all structures;
- (b) Elevation in relation to mean sea level to which any structure has been floodproofed;
- (c) Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet the floodproofing in section 9A-5.202 and

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(d) Description of the extent to which any watercourse will be altered or relocated as a result of proposed development. (Ord. No. 84-32, § 9A-4)

Sec. 9A-4.2. Designation of the administrative officer.

The administrative officer is hereby appointed to administer and implement this chapter by granting or denying development permit applications in accordance with its provisions. (Ord. No. 84-32, § 9A-4)

Sec. 9A-4.3. Duties and responsibilities of the administrative officer.

Duties of the administrative officer shall include, but not be limited to:

Sec. 9A-4.3-1. Permit review.

(a) Review all development permits to determine that the permit requirements of this chapter have been satisfied.

(b) Review all development permits to determine that all necessary permits have been obtained from those federal, state or local governmental agencies from which prior approval is required.

(c) Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the encroachment provisions of section 9A-5.3(a) are met.

(Ord. No. 84-32, § 9A-4)

Sec. 9A-4.3-2. Use of other base flood data.

When base flood elevation and floodway data has not been provided in accordance with section 9A:3.2, Basis for Establishing the Areas of Special Flood Hazard, the administrative officer shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal, state or other source, in order to administer sections 9A-5.2-1, Specific Standards, Residential Construction, and 9A-5.2-2, Specific Standards, Nonresidential Construction. (Ord. No. 84-32, § 9A-4; Ord. No. 87-4, §2.)

Sec. 9A-4.3-3. Information to be obtained and maintained.

(a) Obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures, and whether or not the structure contains a basement.

(b) For all new substantially improved floodproofed structures:

(1) Verify and record the actual elevation (in relation to mean sea level); and

(2) Maintain the floodproofing certifications required in section 9A-4. 1(c).

(c) Maintain for public inspection all records pertaining to the provisions of this chapter.

(Ord. No. 84-32, § 9A-4)

Sec. 9A-4.3-4. Alteration of watercourses.

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(a) Notify adjacent communities and the Department of Environmental Protection prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.

(b) Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.  
(Ord. No. 84-32, § 9A-4)

Sec. 9A-4.3-5. Interpretation of FIRM boundaries.

Make interpretations where needed, as to the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in section 9A-4.4. (Ord. No. 84-32, § 9A-4)

Sec. 9A-4.4. Variance procedure.

Sec. 9A-4.4-1. Appeal board.

(a) The township committee as established by Princeton Township shall hear and decide appeals and requests for variances from the requirements of this chapter.

(b) The township committee shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the administrative officer in the enforcement or administration of this chapter.

(c) Those aggrieved by the decision of the township committee, or any taxpayer, may appeal such decision to the municipal court, as provided in N.J.A.C. 5:23-2.31.

(d) In passing upon such applications, the township committee shall consider all technical evaluations, all relevant factors, standards specified in other sections of this chapter, and

(1) The danger that materials maybe swept onto other lands to the injury of others;

(2) The danger to life and property due to flooding or erosion damage;

(3) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner.

(4) The importance of the services provided by the proposed facility to the community.

(5) The necessity to the facility of a waterfront location, where applicable;

(6) The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;

(7) The compatibility of the proposed use with existing and anticipated development;

(8) The relationship of the proposed use to the comprehensive plan and flood plain management program of that area;

(9) The safety of access to the property in times of flood for ordinary and emergency vehicles;

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(10) The expected heights, velocity, duration, rate of rise, and the sediment transport of the flood waters and the effects of wave action, if applicable, expected at the side; and

(11) The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.

(e) Upon consideration of the factors of section 9A-4.4-1 (d) and the purposes of this chapter, the township committee may attach such conditions to the granting of variances as it deems necessary to further the purposes of this chapter.

(f) The administrative officer shall maintain the records of all appeal actions, including technical information, and report any variances to the Federal Insurance Administration upon request. (Ord. No. 84-32, § 9A-4)

Sec. 9A-4.4-2. Conditions for variances.

(a) Generally, variances may be issued for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items (1 - 11) in section 9A-4.4- 1(d) have been fully considered. As the lot size increases beyond the one-half acre, the technical justification required for issuing the variance increases.

(b) Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places, without regard to the procedures set forth in the remainder of this section.

(c) Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.

(d) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

(e) Variances shall only be issued upon:

(1) A showing of good and sufficient cause;

(2) A determination that failure to grant the variance would result in exceptional hardship to the applicant; and

(3) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public as identified in section 9A-4.4-1 (d), or conflict with existing local laws or ordinances.

(f) Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

(Ord. No. 84-32, § 9A-4)

Sec. 9A-5. Provisions for flood hazard reduction. Sec. 9A-5.1. General standards.

In all areas of special flood hazards the following standards are required;

Sec. 9A-5.1-1. Anchoring.

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(a) All new construction and substantial improvements, shall be anchored to prevent flotation, collapse, or lateral movement of the structure.

(b) All manufactured homes shall be anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state and local anchoring requirements for resisting wind forces. (Ord. No. 84-32, § 9A-5; Ord. No. 87-4, § 3.)

Sec. 9A-5.1-2. Construction materials and methods.

(a) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

(b) All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.  
(Ord. No. 84-32, § 9A-5)

Sec. 9A-5.1-3. Utilities.

(a) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.

(b) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding, and;

(c) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into systems and discharge from the systems into flood waters.

(d) Electrical heating, ventilation, plumbing and air-conditioning equipment and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding. (Ord. No. 84-32, § 9A-5; Ord. No. 87-4, § 4.)

Sec. 9A-5.1-4. Subdivision proposals.

(a) All subdivision proposals shall be consistent with the need to minimize flood damage;

(b) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage;

(c) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; and

(d) Base flood elevation data shall be provided for subdivision proposals and other proposed development which contain at least fifty lots or five acres (whichever is less).

(Ord. No. 84-32, § 9A-5)

Sec. 9A-5.1-5. Enclosure openings.

For all new construction and substantial improvements, fully enclosed areas below the lowest floor that are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting these requirements must either be certified by a

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registered professional engineer or architect or must meet or exceed the following minimum criteria: A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of flood waters.  
(Ord. No. 87-4, § 5.)

Sec. 9A-5.2. Specific standards.

In all areas of special flood hazards where base flood elevation data have been provided as set forth in section 9A-3.2, Basis for Establishing the Areas of Special Flood Hazard or in section 9A-4.3-2, Use of Other Base Flood Data, the following standards are required: (Ord. No. 84-32, § 9A-5)

Sec. 9A-5.2-1. Residential construction.

New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated to or above base flood elevation.(Ord. No. 84-32, § 9A-5)

Sec. 9A-5.2-2. Non-residential construction.

New construction and substantial Improvement of any commercial, industrial or other non-residential structure shall either have the lowest floor, including basement, elevated to the level of the base flood elevation; or, together with attendant utility and sanitary facilities, shall:

- (a) Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;
- (b) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting the applicable provisions of this subsection. Such certification shall be provided to the official as set forth in section 9A-4.3-3(2).
- (c) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

(Ord. No. 84-32, § 9A-5; Ord. No. 87-4, § 6; Ord. No. 88-19, § 2.)

Sec. 9A-5.2-3. Manufactured homes.

- (a) Manufactured homes shall be anchored in accordance with section 9A-5.1-1(b).
- (b) All manufactured homes to be placed or substantially improved on a permanent foundation such that the top of the lowest floor is at or above the base flood elevation.  
(Ord. No. 84-32, § 9A-5; Ord. No. 87-4, § 7.)

Sec. 9A-5.3. Floodways.

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Located within areas of special flood hazard established in section 9A-3.2 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles, and erosion potential, the following provisions apply:

(a) Prohibit encroachments, including fill, new construction, substantial improvements and other development unless a technical evaluation demonstrates that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

(b) If section 9A-5.3(a) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of section 9A-5.0 Provisions for Flood Hazard Reduction.

(c) Prohibit the placement of any manufactured home, except in an existing manufactured home park or existing manufactured subdivision.

(d) In all areas of special flood hazard in which base flood elevation data has been provided and no floodway has been designated, the cumulative effect of any proposed development, when combined with all other existing and anticipated development, shall not increase the water surface elevation of the base flood more than two-tenths (0.2) of a foot at any point.

(Ord. No. 84-32, § 9A-5; Ord. No. 87-4, § 8.)

**Suggested Changes to Existing Flood Damage Prevention Ordinance**

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Section 9A-2. Definitions

Revise the following (with the additions shown underlined):

“Development” means any man made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials located within the area of special flood hazard.

“Flood Plain Management Regulations” means zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a flood plain ordinance, grading ordinance, erosion control ordinance) and other applications of police power. The term describes such State or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

“Historic Structure means any structure that is:

Listed individually in the National Register of Historic Places (a listing maintained by the Department of the Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;

Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district preliminary determined by the Secretary to qualify as a registered historic district;

Individually listed on a State inventory of historic places in States with historic preservation programs which have been approved by the Secretary of the Interior; or Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:

By an approved State program as determined by the Secretary of

The Interior; or Directly by the Secretary of the Interior in States without approved \_\_\_\_\_ programs.

“Manufactured home” means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term “manufactured home” does not include a “recreational vehicle.”

“New manufactured home park or subdivision” means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of the flood plain management regulations adopted by the municipality.

“Recreational vehicle” means a vehicle which is (i) built on a single chassis; (ii) 400 square feet or less when measured at the longest horizontal projections; (iii) designed to be self-propelled or permanently towable by a light duty truck; and (iv) designed

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primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

“Start of Construction” (for other than new construction or substantial improvements under the Coastal Barrier Resources Act (P.L. No. 97-348) includes substantial improvements and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site such as the pouring of a slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation, or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling nor does it include the installation of streets and/or walkways, nor does it include excavation for a basement, footings or piers, or foundations or the erection of temporary forms, nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor or other structural part of a building, whether or not that alteration effects the external dimensions of the building.

“Substantial Damage” means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

“Substantial Improvement” means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which exceeds 50 percent of the market value of the structure before the “start of construction” of the improvement. This term includes structures which have incurred “substantial damage”, regardless of the actual repair work performed. The term does not, however, include either:

- (1) Any project for improvement of a structure to correct existing violations of State or local health, sanitary or safety code specifications which have been identified by the local code enforcement officer and which are the minimum necessary to assure safe living conditions; or
- (2) Any alteration of a “historic structure”, provided that the alteration will not preclude the structure’s continued designation as a “historic structure.”

Section 9A-4.4-2. Conditions for Variances

Revise (b) to the following:

- (2) Variances may be issued for the repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure’s continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.

**Resolution for Adoption of Flood Mitigation Plan**

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PRINCETON TOWNSHIP  
COUNTY OF MERCER, STATE OF NEW JERSEY

RESOLUTION

WHEREAS, the Township of Princeton in cooperation with the United States Department of Agriculture, Natural Resources Conservation Service, is in the process of updating Chapter 9A of the A Code of the Township of Princeton, New Jersey, 1968" concerning flood damage prevention; and

WHEREAS, in addition to updating said chapter of the Township Code, the Township has developed a flood mitigation plan entitled: A Flood Mitigation Plan: Township of Princeton, Mercer County, New Jersey, January 2005 as Amended@ which further addresses measures to prevent and mitigate against flooding within the Township of Princeton; and

WHEREAS, the Township Committee wishes to adopt said flood mitigation plan.

NOW, THEREFORE, BE IT RESOLVED by the Township Committee of the Township of Princeton as follows:

The Township of Princeton hereby adopts the following plan: A Flood Mitigation Plan: Township of Princeton, Mercer County, New Jersey, dated January 2005 as Amended.@ A copy of said plan is on file in the Office of the Township Clerk and may be inspected during regular office hours.

A certified true copy of this resolution together with a copy of the aforementioned flood mitigation plan shall be furnished to the Princeton Township Committee on Flood Control, the Princeton Environmental Commission and to the United States Department of Agriculture, Natural Resources Conservation Service, 220 Davidson Avenue, 4<sup>th</sup> Floor, Somerset, New Jersey 08873, Attention: Gregory J. Westfall, Water Resources Planner upon its adoption.

CERTIFICATION

I, LINDA S. McDERMOTT, Clerk of the Township of Princeton, hereby certify that the foregoing Resolution was adopted by the Township Committee of the Township of Princeton at its meeting held on September 12, 2005.

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LINDA S. McDERMOTT, Clerk  
Township of Princeton

## **Community Rating System**

## National Flood Insurance Program

### Community Rating System

## SUMMARY

<http://training.fema.gov/EMIWeb/CRS/>

**Background:** Since 1968 the National Flood Insurance Program (NFIP) has provided federally backed flood insurance to encourage communities to enact and enforce floodplain regulations. The program has been very successful in helping flood victims get back on their feet. There are over 2.2 million policies in force. Since 1978, 350,000 insurance losses have been paid out for a total of \$2.5 billion.

In order to be covered by a flood insurance policy, a property must be in a community that participates in the NFIP. To qualify, a community adopts and enforces a floodplain management ordinance to regulate proposed development in flood hazard areas. The objective of the ordinance is to ensure that such development will not aggravate existing flooding conditions and that new buildings will be protected from future flood damage. To date nearly 18,000 communities in the United States participate.

The NFIP has been successful in requiring new buildings to be protected from damage by the 100-year flood. However, the program had few incentives for communities to do more than enforce the minimum regulatory standards. Flood insurance rates had been the same in all participating communities, even though some do much more than regulate construction of new buildings to the national standards.

Until now the program did little to recognize or encourage community activities to reduce flood damages to existing buildings, to manage development in areas not mapped by the NFIP, to protect new buildings beyond the minimum NFIP protection level, to help insurance agents obtain flood data, or to help people obtain flood insurance. Because these activities can have a great impact on the insurance premium base, flood damages flood insurance claims, and federal disaster assistance payments, the Federal Insurance Administration (FIA) has implemented the Community Rating System (CRS).

**The Concept:** Experience since the turn of the century (1900) has shown that fire insurance public protection class given to a community has been a very strong incentive to local officials to maintain or improve their fire protection programs. Local governing boards ensure that their fire alarm communications, water supply and distribution, and overall fire department facilities, including

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staffing, equipment, training and other items meet or exceed the insurance industry's minimum criteria in order to maintain favorable fire insurance rate classes for their communities.

In March 1987, the Federal Insurance Administrator established a Community Rating Task Force with members from FIA, insurance companies, and state and local floodplain managers. The Task Force established three goals for the CRS:

“To encourage, by the use of flood insurance premium adjustments community and state activities beyond those required by the National Flood Insurance Program to:

- Reduce flood losses,
- Facilitate accurate insurance rating, and
- Promote the awareness of flood insurance.”

The Task Force worked with the Association of State Floodplain Managers (ASFPM) and ISO/Commercial Risk Services, Inc. (ISO) to develop a rating Schedule and administrative procedures. ISO is a non-profit corporation subscribed to by more than 1300 insurance companies. Among other services, ISO develops and provides advisory fire insurance classification of community fire protection programs.

The CRS is the product of three years of development, field testing, critiques and reviews with communities, public interest organizations and ASFPM's technical advisors. The work has been reviewed by 400 professional floodplain managers, 50 public interest organizations, and 41 communities. However, the CRS will always be subject to change and improvement as more experience is gained in administering it and as more is learned about effective floodplain management techniques.

**Community Classification:** Flood insurance premium credits are available in communities based on their CRS classification. There are ten classes with Class 1 having the greatest premium credit and Class 10 having no premium credit. A community's CRS class is based on the number of credit points calculated for the activities that are undertaken to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance.

A community is automatically in Class 10 unless it applies for CRS classification and it shows that the activities that it is implementing warrant a better class. The amount of premium credit for each class is published annually by FIA.

The CRS rewards those communities that are doing more than the minimum NFIP requirements to their residents prevent or reduce flood losses. The system should also provide an incentive for communities to initiate new flood protection activities.

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**Operation:** Community application for CRS classification is voluntary. Any community in full compliance with the rules and regulations of the NFIP may apply for a CRS classification. The applicant community submits documentation that it is implementing one or more of the activities recognized in the CRS Schedule.

The Schedule identifies 18 creditable activities, organized under four categories in Sections 300-600: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness. They are listed on the last page of this Summary. The Schedule assigns credit points based on how well an activity affects the three goals of the CRS. Communities are welcome to propose alternative approaches in their applications.

Some of the activities may be implemented by the state or a regional district rather than at the local level. For example, some states have disclosure laws that may meet the credit criteria of Activity 340 - Flood Hazard Disclosure. In such cases, any community in those states or districts could receive credit points if the community applies for a CRS classification and if the state or district program is, in fact, being implemented in the community.

The Regional Office of the Federal Emergency Management Agency (FEMA) and the State NFIP Coordinator review and comment on the application. FIA verifies the information and the community's implementation of the activities. FIA sets the credit to be granted and notifies the community, the state, the insurance companies, and other appropriate parties.

The community's activities and performance are reviewed periodically. If it is not properly or fully implementing the credited activities, its credit points and possibly, its CRS classification, will be revised. A community may add or drop creditable activities each year. Credit criteria for each activity may also change as more experience is gained in implementing, observing and measuring the activities.

**Costs and Benefits:** No fee is charged for a community to apply for classification or to participate in the CRS. Because there may be a cost to implement the creditable activities, some communities may be concerned whether the cost of initiating a new activity will be offset by the flood insurance premium credits.

It is important to note that reduction in flood insurance rates is only one of the rewards communities receive from undertaking the activities credited under the Community Rating System. Others include increased public safety, reduction of damages to property and public infrastructure, avoidance of economic disruption and losses, reduction of human suffering, and protection of the environment.

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Communities should prepare and implement those activities that best deal with the local flood problem, not just those items that are listed in the Schedule. In considering whether to undertake a new activity, communities will want to consider all of the benefits the activity will provide (in addition to insurance premium credits) in order to determine whether it is cost effective.

**Activities Credited Under the Community Rating System**

(Sections 100 and 200 cover other topics in the CRS Schedule)

300 Public Information Activities

- 310 Elevation Certificate: Maintain FEMA's Elevation Certificate and make copies available to inquirers.
- 320 Map Determinations: Respond to inquiries for Flood Insurance Rate Map zone and flood data.
- 330 Outreach Projects: Advise residents about the flood hazard, flood insurance, and flood protection measures.
- 340 Hazard Disclosure: Advise potential purchasers of flood-prone property about the hazard.
- 350 Flood Protection Library: Maintain and publicize a library of references on flood insurance and flood protection.
- 360 Flood Protection Assistance: Provide direct advice to property owners desiring to protect themselves from flooding.

400 Mapping and Regulatory Activities

- 410 Additional Flood Data: Develop new flood elevations, floodway delineations, wave heights, or other regulatory flood hazard data.
- 420 Open Space Preservation: Credit is provided according to the amount of vacant floodplain that is kept free of buildings and filling.
- 430 Higher Regulatory Standards: Regulation that require new development to be protected to a level greater than the NFIP rules.
- 440 Flood Data Maintenance: Make the community's floodplain maps more current, useful, or accurate.
- 450 Stormwater Management: Regulate new developments throughout the watershed to minimize their impact on surface drainage and runoff.

500 Flood Damage Reduction Activities

- 510 Repetitive Loss Projects: Develop and implement a plan to mitigate losses in repeatedly flooded areas.

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- 520 Acquisition and Relocation: Purchase or relocate buildings and convert flood-prone properties to open space.
- 530 Retrofitting: Credit is provided according to how buildings have been retrofitted to protect them from flood damages.
- 540 Drainage System Maintenance: Conduct periodic inspections and maintain the capacities of the channels and retention basins.

600 Flood Preparedness Activities

- 610 Flood Warning Program: Provide early flood warnings to the general public and special facilities.
- 620 Levee Safety: Maintain levees that are not credited with providing base flood protection and emergency response plans for them.
- 630 Dam Safety: All communities in a state with an approved dam safety program receives credit.

## **Flood Insurance Rate Map and Flood Insurance Study**

Contact FEMA for this map.