



Mitigation Plan for Four New Jersey Counties  
**Gloucester County Appendices**

**Appendix GC.24**  
**Woodbury Heights Borough, New Jersey**

April 8, 2016

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## Part 1: Overview

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### Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

### Part 1.2: Woodbury Heights Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Woodbury Heights Borough in Gloucester County, New Jersey.

The Woodbury Heights Borough Municipal Working Group recommended the Woodbury Heights Borough (Gloucester County) Municipal Appendix for adoption to the Woodbury Heights Borough Council.

The Woodbury Heights Borough Council adopted the Municipal Appendix by resolution (see Attachment B: Adoption Resolution).

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix (see Attachment C: Appeal Letter).

## Part 2: Participation

### Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.24-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

**Table GC.24-1: Woodbury Heights Borough (Gloucester County) Working Group**

First Name	Last Name	Department	Position	Round 1 Work Session <sup>1</sup>	Round 2 Work Session <sup>2</sup>	Contribution <sup>3</sup>
Robbie	Conley	Woodbury Heights OEM / Planning Board	Emergency Management Coordinator / Planning Board Member	☑	☑	Organized Working Group and Work Sessions.
Ronald	Tomasetti	Woodbury Heights OEM	Deputy OEM Coordinator		☑	
Christian	Romano	Woodbury Heights Construction Office	Construction Official / Floodplain Administrator		☑	
Mark	Bruermer	Woodbury Heights Engineering / Planning Board	Borough Engineer / Planning Board Member	☑	☑	
Richard	Middleton	Woodbury Heights Public Works	Public Works Manager	☑	☑	
Gary R.	Krohn	Woodbury Heights Police Department	Investigator	☑	☑	
Thomas	Radcliff Jr.	Woodbury Heights Fire Department	Fire Captain	☑	☑	

<sup>1</sup> Round 1 Work Session was held on October 8, 2014.

<sup>2</sup> Round 2 Work Session was held on October 29, 2014.

<sup>3</sup> Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.24-1.

## Part 2: Participation

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The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.<sup>4</sup>

- Elected Officials
- Community / Faith-Based Organizations
- Environmental Organizations
- Healthcare Institutions
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Business Associations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Major Employers and Businesses

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<sup>4</sup> See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

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## Part 2: Participation

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### Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.24-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

**Table GC.24-2: Public Participation**

Date	Type of Involvement	Location
October 14, 2014	Link to Project Website ( <a href="http://nj4hmp.com">http://nj4hmp.com</a> ) established	Borough of Woodbury Heights <sup>5</sup>
November, 2014	Flyers posted	Borough Hall Firehouse and select local businesses
November 24, 2014	Information item included on Woodbury Heights Borough Committee agenda identifying opportunities for public participation	Woodbury Heights Borough Hall
December 6, 2014	Public outreach	Borough Tree Lighting
December 17, 2014	Public hearing included on Woodbury Heights Borough Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Woodbury Heights Borough Hall
December 19, 2014	Preliminary Municipal Appendix posted to website for public comment	Borough of Woodbury Heights <sup>5</sup>

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

In addition, the Municipal Appendix was adopted as part of a regularly scheduled public meeting (see Attachment B: Adoption Resolution).

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.<sup>6</sup> In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.<sup>7</sup>

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<sup>5</sup> <http://www.bwhnj.com/>

<sup>6</sup> See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

<sup>7</sup> See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

## Part 3: Hazard Identification and Risk Assessment

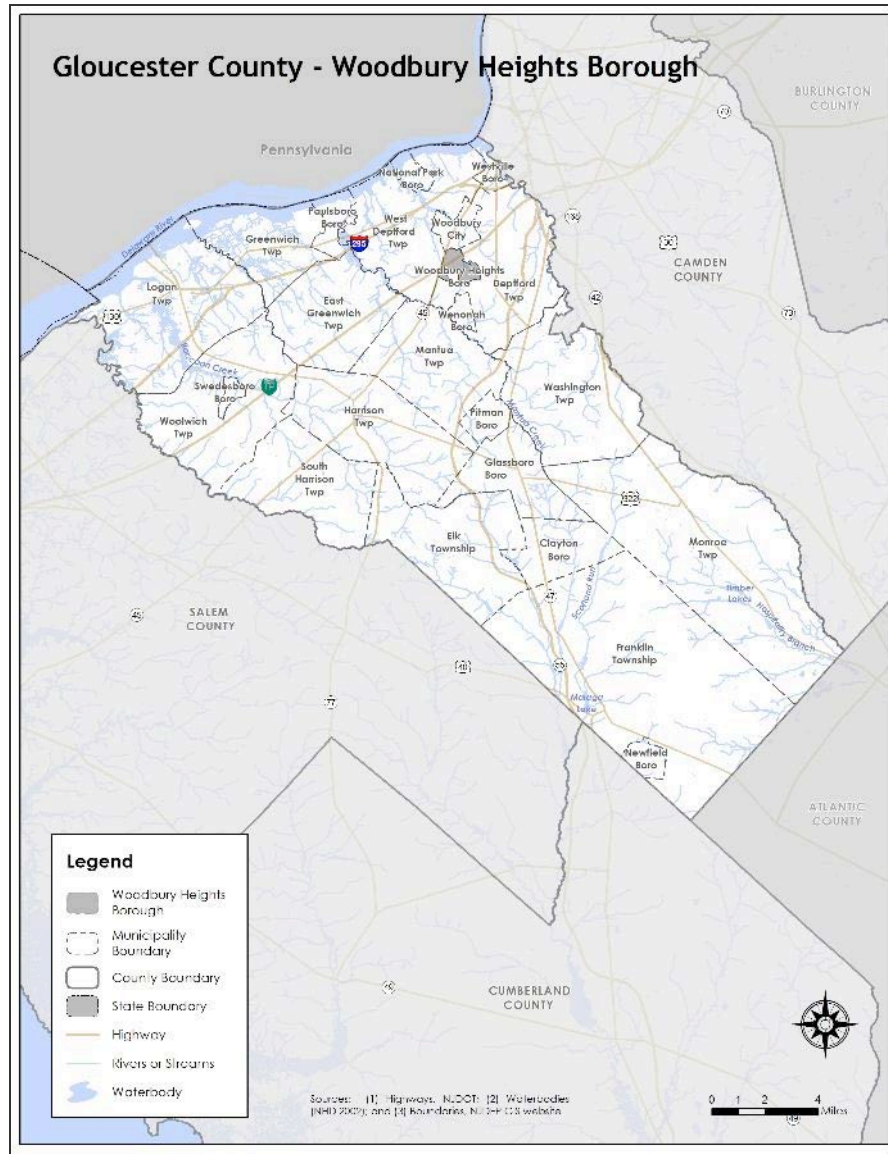
### Part 3.1: Municipal Profile

Part 3.1 includes:

- Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation
- A brief character sketch for the municipality that is only intended to portray a few of the most basic elements

Woodbury Heights Borough is located in the northeastern part of Gloucester County (See Figure GC.24-1).

Figure GC.24-1: Woodbury Heights Borough (Gloucester County) Location Map



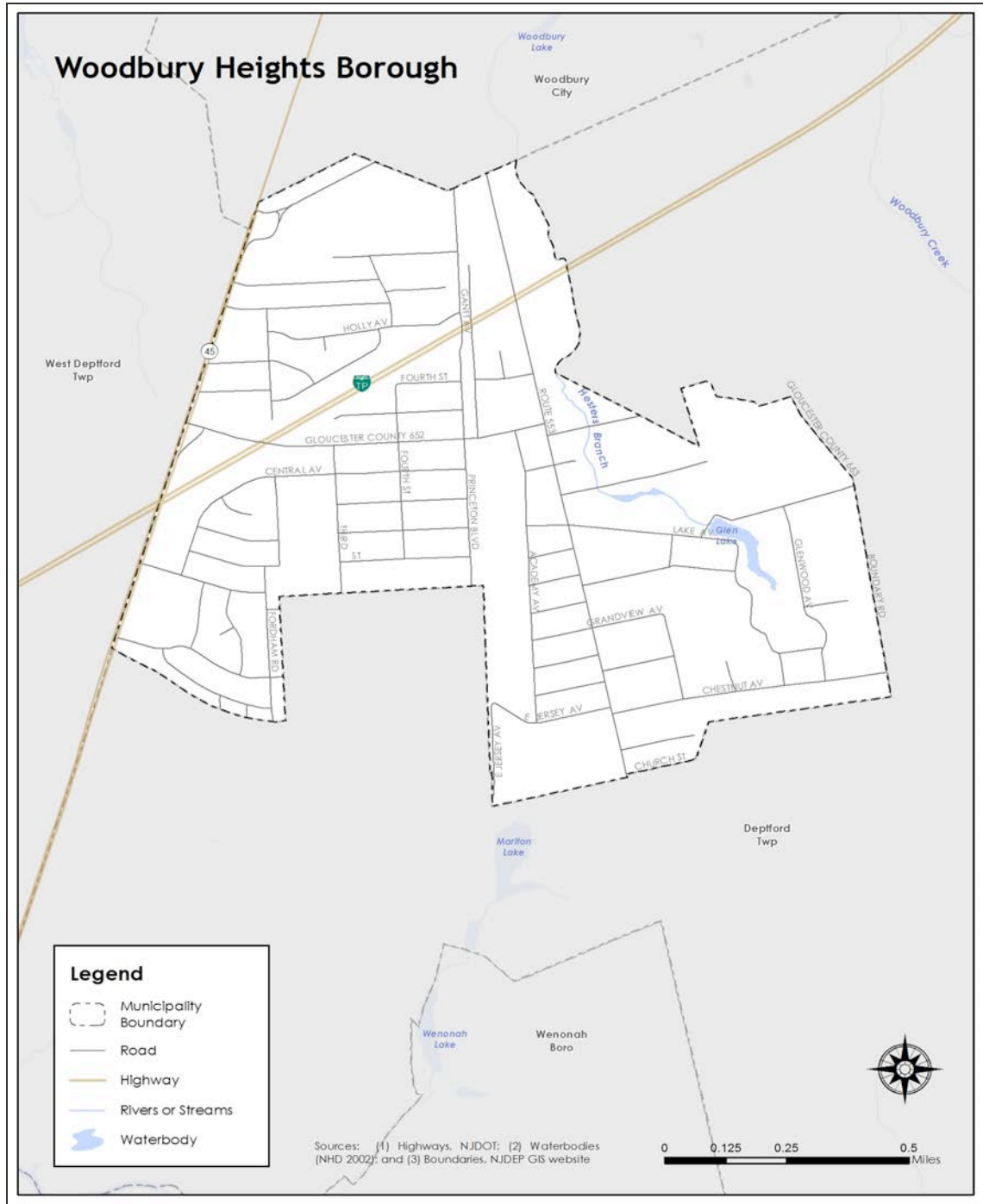


### Part 3: Hazard Identification and Risk Assessment

Woodbury Heights Borough is a small rural community in Gloucester County.

Per Figure GC.24-2, the major water courses include Hesters Branch and Glen Lake. Major transportation routes include the New Jersey Turnpike and State Highway 45, Gloucester County Route 553, and municipal road Elm Avenue. Additionally, a Conrail commercial railroad line runs through the Borough. The land is predominantly flat.

Figure GC.24-2: Woodbury Heights Borough Base Map



### Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.24-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

**Table GC.24-3: Woodbury Heights Borough Demographics**  
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Woodbury Heights Borough	Gloucester County	Region	New Jersey
2000 Population	2,988	254,673	974,328	8,414,350
2010 Population	3,055	288,288	1,024,926	8,791,894
Percent Change	2.24%	13.2%	5.19%	4.49%
Population Density	2,499.4 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	1.22 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	22.6	24.4	24.1	23.5
% of Population 18 - 64	63.8	63.2	62.7	63
% of Population 65 and over	13.6	12.4	13.2	13.5

Table GC.24-4 illustrates how Woodbury Heights Borough ranks in the county, the four county region, and New Jersey.

**Table GC.24-4: Woodbury Heights Borough Demographic Rankings**

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	20	66	448
Land Area Rank	17	72	463
Population Density Rank	7	37	251
Population Change Rank	14	37	-

Table GC.24-5 includes information related to economic and housing statistics for Woodbury Heights Borough, Gloucester County, the four county region, and New Jersey.

**Table GC.24-5: Woodbury Heights Borough Economics and Housing**  
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Woodbury Heights Borough	Gloucester County	Region	New Jersey
Date Incorporated	April 27, 1915	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$82,411	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	1,125	109,796	397,990	3,529,033
Occupied Housing Units	1,081	104,271	372,472	3,176,069
Vacant Housing Units	44	5,525	25,518	352,964
Owner Occupied Housing Units	985	83,525	266,593	2,126,279

**Part 3: Hazard Identification and Risk Assessment**

	Woodbury Heights Borough	Gloucester County	Region	New Jersey
Renter Occupied Housing Units	96	20,746	105,879	1,049,790
Building Permits	0	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

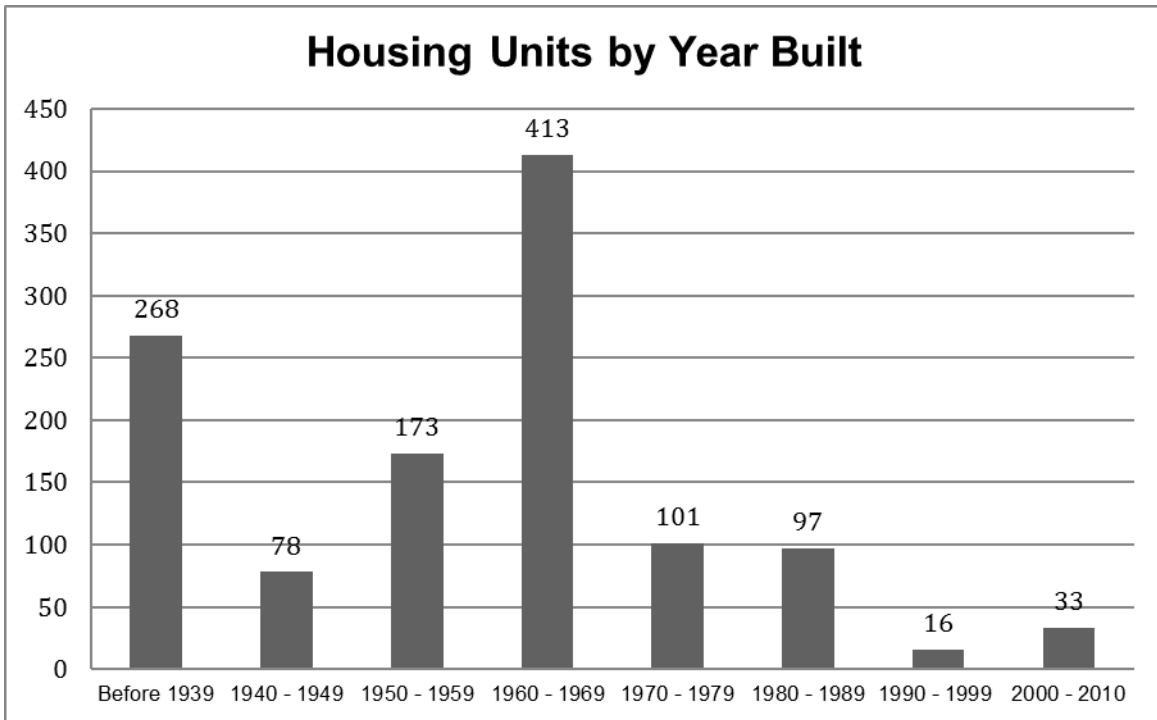
Table GC.24-6 illustrates how Woodbury Heights Borough ranks in the county and the four county region.

**Table GC.24-6: Woodbury Heights Borough Ranking (Economics and Housing)**

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	7	13
Vacant Housing Rank	22	78
Renter Occupied Housing Rank	22	78
Building Permits	24	87

Figure GC.24-3 illustrates development patterns in Woodbury Heights Borough by examining housing units by year built. About 37% of homes in Woodbury Heights Borough were built during the 1960s.

**Figure GC.24-3: Woodbury Heights Borough Housing Units by Year Built**  
(Source: 2010 ACS 5 Year Estimates, DP 4)



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## Part 3: Hazard Identification and Risk Assessment

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### Part 3.2: Hazard Priorities

*Part 3.2 includes hazard priority determinations per the Municipal Working Group.*

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP<sup>1</sup> were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

#### High Priority

- None

#### Moderate Priority

- Flood
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

#### Low Priority

- Dam Failure
- Drought
- Earthquake
- Extreme Temperature: Cold & Hot
- Wildfire

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

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<sup>1</sup> See *Section 3: Hazard Identification and Risk Assessment*.

## Part 3: Hazard Identification and Risk Assessment

### Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.24-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps will be used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

**Table GC.24-7: Supporting Mapping and Exhibits**

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

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## Part 3: Hazard Identification and Risk Assessment

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### Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.24-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

*Note: Shaded cells (if any) will be completed as part of follow-up efforts to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).*

Table GC.24-9 provides the means to record results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results will indicate critical facilities that are potentially exposed to specific hazards.

*Note: This information will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).*

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

### Part 3: Hazard Identification and Risk Assessment

**Table GC.24-8: Woodbury Heights Borough (Gloucester County) Critical Facilities Inventory**

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative Offices	500 Elm Avenue, Woodbury Heights		N	N	Alternate EOC	M-5
CF-2	Emergency Operations Center	EOC	Co-located Facilities	534 Elm Avenue, Woodbury Heights	CF-4	N	N		
CF-3	Woodbury Heights Police Department	Law Enforcement Facilities	Stations	520 Elm Avenue, Woodbury Heights		N	Y	Includes a holding cell	M-22
CF-4	Woodbury Heights Improvement, Protective & Fire Association	FireStation / EMS	Stations	534 Elm Avenue, Woodbury Heights	CF-2	N	N		M-6
CF-5	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	430 Glassboro Road, Woodbury Heights		N	Y <sup>2</sup>		M-7 / M-21
CF-6	Wellhead	Utilities – Water	Wellhead	730 Helen Avenue, Woodbury Heights		N/A	Y		
CF-7	Water Tower	Utilities – Water	Water Towers	Grandview Avenue, Woodbury Heights		N/A	N		
CF-8	Candidus Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	736 Candidus Avenue, Woodbury Heights		N/A	Y <sup>2</sup>		M-8
CF-9	Central Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	153 Central Avenue, Woodbury Heights		N/A	Y <sup>2</sup>		M-9
CF-10	Chestnut Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	318 Chestnut Avenue, Woodbury Heights		N/A	Y <sup>2</sup>		M-10
CF-11	Glenwood Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	295 Glenwood Avenue, Woodbury Heights		N/A	Y <sup>2</sup>		
CF-12	Helen Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	717 Helen Avenue, Woodbury Heights		N/A	Y <sup>2</sup>		M-11

<sup>2</sup> Portable back-up generator hook-up and portable back-up generator available to critical facility.

**Part 3: Hazard Identification and Risk Assessment**

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-13	Route 45 Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	834 Mantua Pike, Woodbury Heights		N/A	Y <sup>2</sup>		M-12
CF-14	Woodland Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	1240 Glassboro Road, Woodbury Heights		N/A	Y <sup>2</sup>		M-13
CF-15	Woodbury Heights Elementary School	Schools	Public Schools	100 Academy Avenue, Woodbury Heights		N	N		
CF-16	Gateway Regional High School	Schools	Public Schools	775 Tanyard Road, Woodbury Heights		Y <sup>3</sup>	Y <sup>4</sup>		M-14
CF-17	Saint Margaret School	Schools	Private Schools	773 Third Street, Woodbury Heights		N	N		
CF-18	Beech House <sup>5</sup>	Vulnerable Populations Facilities	Assisted Living	300 Beech Avenue, Woodbury Heights		N	N		
CF-19	Lincoln House <sup>5</sup>	Vulnerable Populations Facilities	Assisted Living	395 Lincoln Avenue, Woodbury Heights		N	N		
CF-20	Woodbury Heights Community Center	Municipal – Other	Community Center	741 Helen Avenue, Woodbury Heights		Y	N	Alternate EOC	M-15

<sup>3</sup> Shelter of last resort.

<sup>4</sup> Back-up generator provides partial building coverage for emergency lighting.

<sup>5</sup> Shelter in place.



**Part 3: Hazard Identification and Risk Assessment**

**Table GC.24-9: Woodbury Heights Borough (Gloucester County) Critical Facilities Hazard Exposure**

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Woodbury Heights Police Department	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	Woodbury Heights Improvement, Protective & Fire Association	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	Public Works	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	Wellhead	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-7	Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-8	Candidus Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-9	Central Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-10	Chestnut Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-11	Glenwood Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-12	Helen Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-13	Route 45 Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-14	Woodland Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-15	Woodbury Heights Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-16	Gateway Regional High School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-17	Saint Margaret School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-18	Beech House	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-19	Lincoln House	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

**Part 3: Hazard Identification and Risk Assessment**

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-20	Woodbury Heights Community Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

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## Part 4: Mitigation Measures

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### Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

## Part 4: Mitigation Measures

### Part 4.2: SDVR HMP Mitigation Measures

*Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.*

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.24-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.24-10.

**Table GC.24-10: Status of Woodbury Heights Borough (Gloucester County) SDVR HMP Mitigation Measures**

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
<b>Woodbury Heights 1:</b> Install under-drains in Summit Section of Woodbury Heights (Alliance Street between Fordham Road and Central Avenue; sections of Auburn Street and Fordham Road) connecting to the storm sewer; new drainage would drop the groundwater level below the sanitary sewer system to avoid infiltration .	Work-in-progress, additional funding needed	Woodbury Heights Borough completed an infiltration study funded through the capital improvement budget. Woodbury Heights Borough Public Works Department has done some work in mitigating this issue, but the issue requires additional work. Therefore, mitigation measure is included in update Municipal Appendix.	M-17
<b>Woodbury Heights 2:</b> System redundancy and hazard threat recognition of water/sewage facility/pipes.	Not completed, not funded	Issue is not considered valid. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
<b>Woodbury Heights 3:</b> System redundancy of water facility (town well) located on Helen Avenue (water tank is on Grand View Street).	Not completed, not funded	Mitigation measure is included in updated Municipal Appendix.	M-16
<b>Woodbury Heights 4:</b> Back-up generator for EOC (municipality building).	Not completed, not funded	Revised mitigation measure is included in updated Municipal Appendix.	M-5

**Table GC.24-10 Notes:**

- A. See Tables GC.24-11 and GC.24-12 for municipal (M-#) mitigation measures
- B. See Table GC.24-13 for multi-jurisdictional (MJ-#) mitigation measures

## Part 4: Mitigation Measures

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### Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.24-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)<sup>1</sup> if applicable

*Note: Woodbury Heights Borough does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.*

Table GC.24-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

*Note: Mitigation measures with discrete locations are shown in Figure GC.24-4.*

**Table GC.24-11: Woodbury Heights Borough (Gloucester County) Municipal Mitigation Measures Identification**

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none"> <li>• Current hazards and risks</li> <li>• Changing conditions and actions that may reduce / increase risk</li> <li>• Best practices for hazard mitigation at the individual or property level.<sup>2</sup></li> </ul>	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Flood	Goal #2	Existing

<sup>1</sup> See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

<sup>2</sup> For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

## Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Install permanent backup emergency power generator for Borough Hall / EOC (CF-1).	All	Goal #4	Both
M-6	Upgrade permanent backup emergency power generator for Fire Station / EMS (CF-4).	All	Goal #4	Both
M-7	Upgrade permanent backup emergency power generator for Public Works facility (CF-5).	All	Goal #4	Both
M-8	Install permanent backup emergency power generator for Candidus Avenue pump station (CF-8).	All	Goal #4	Both
M-9	Install permanent backup emergency power generator for Central Avenue pump station (CF-9).	All	Goal #4	Both
M-10	Install permanent backup emergency power generator for Chestnut Avenue pump station (CF-10).	All	Goal #4	Both
M-11	Install permanent backup emergency power generator for Helen Avenue pump station (CF-12).	All	Goal #4	Both
M-12	Install permanent backup emergency power generator for Route 45 pump station (CF-13).	All	Goal #4	Both
M-13	Install permanent backup emergency power generator for Woodland Avenue pump station (CF-14).	All	Goal #4	Both
M-14	Install permanent backup emergency power generator for Gateway Regional High School (CF-16).	All	Goal #4	Both
M-15	Install permanent backup emergency power generator for Community Center (CF-20).	All	Goal #4	Both
M-16	System redundancy of water facility (town well) located on Helen Avenue (water tank is on Grand View Street).	All	Goal #4	Both
M-17	Install under-drains in Summit Section of Woodbury Heights (Alliance Street between Fordham Road and Central Avenue; sections of Auburn Street and Fordham Road) connecting to the storm sewer; new drainage would drop the groundwater level below the sanitary sewer system to avoid infiltration .	Flood	Goal #4	Both
M-18	Upgrade stormwater collection capacity on Alliance Street.	Flood	Goal #4	Both
M-19	Upgrade storm collection system on Grandview Avenue through Fairview Avenue.	Flood	Goal #4	Both
M-20	Dredge Glen Lake to improve storm water collection.	Flood	Goal #4	Both
M-21	Floodproof / retrofit & harden Public Works Department Facility (CF-5).	Flood / High Wind	Goal #4	Both
M-22	Retrofit / harden Police Department building (CF-3).	High Wind	Goal #4	Both

## Part 4: Mitigation Measures

### Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.24-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria<sup>3</sup>
- Project Type to help determine funding options and implementation mechanisms at the municipal level<sup>4</sup>
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

**Table GC.24-12: Woodbury Heights Borough (Gloucester County) Municipal Mitigation Measures Implementation**

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> <li>▪ Work with County Working Group to identify resource needs and availability.</li> <li>▪ Identify target audience(s).</li> </ul>
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	High	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

<sup>3</sup> See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

<sup>4</sup> See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

## Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Install permanent backup emergency power generator for Borough Hall / EOC (CF-1).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Upgrade permanent backup emergency power generator for Fire Station / EMS (CF-4).	Municipal OEM, Public Works Department, Fire Department / EMS	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Upgrade permanent backup emergency power generator for Public Works facility (CF-5).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Install permanent backup emergency power generator for Candidus Avenue pump station (CF-8).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-9	Install permanent backup emergency power generator for Central Avenue pump station (CF-9).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-10	Install permanent backup emergency power generator for Chestnut Avenue pump station (CF-10).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-11	Install permanent backup emergency power generator for Helen Avenue pump station (CF-12).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-12	Install permanent backup emergency power generator for Route 45 pump station (CF-13).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-13	Install permanent backup emergency power generator for Woodland Avenue pump station (CF-14).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-14	Install permanent backup emergency power generator for Gateway Regional School (CF-16).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-15	Install permanent backup emergency power generator for Community Center (CF-20).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-16	System redundancy of water facility (town well) located on Helen Avenue (water tank is on Grand View Street).	Municipal OEM and Public Works Department	Low	Public Property Mitigation	\$100K - \$500K	Three to five years	Conduct project scoping.



## Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-17	Install under-drains in Summit Section of Woodbury Heights (Alliance Street between Fordham Road and Central Avenue; sections of Auburn Street and Fordham Road) connecting to the storm sewer; new drainage would drop the groundwater level below the sanitary sewer system to avoid infiltration .	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	\$500K - \$1M	Ongoing	Conduct project scoping.
M-18	Upgrade stormwater collection capacity on Alliance Street.	Municipal OEM and Public Works Department	High	Public Property Flood Mitigation	< \$500K	One to three years	Conduct project scoping.
M-19	Upgrade storm collection system on Grandview Avenue through Fairview Avenue.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$500K	One to three years	Conduct project scoping.
M-20	Dredge Glen Lake to improve storm water collection.	Municipal OEM and Public Works Department	Low	Public Property Flood Mitigation	< \$500K	Three to five years	Conduct project scoping.
M-21	Floodproof / retrofit & harden Public Works Department Facility (CF-5).	Municipal OEM and Public Works Department	High	Public Property Mitigation	\$500K - \$1M	Three to five years	Conduct project scoping.
M-22	Retrofit / harden Police Department building (CF-3).	Municipal OEM, Public Works Department, Fire Department	High	Building Retrofit	\$500K - \$1M	Three to five years	Conduct project scoping.

## Part 4: Mitigation Measures

### Part 4.5: Multi-Jurisdictional Mitigation Measures

*Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.*

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.24-13.

*Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

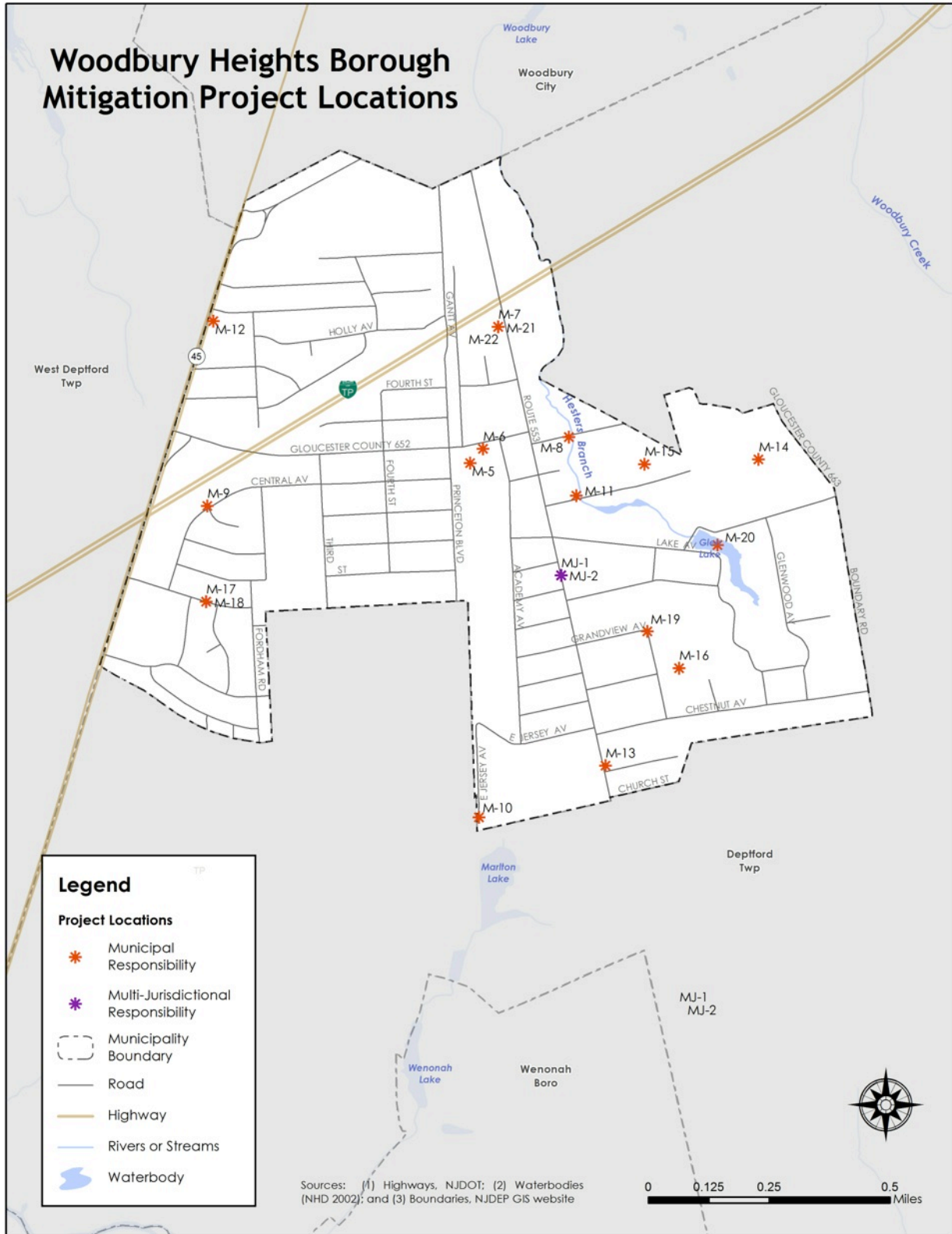
*Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.24-4.*

**Table GC.24-13: Woodbury Heights Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures**

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Improve storm drainage system at County Route 553 (Glassboro Road).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-2	Sanitary sewer line on County Route 553 (Glassboro Road).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	High

# Part 4: Mitigation Measures

Figure GC.24-4: Woodbury Heights Borough Mitigation Project Locations



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## Part 4: Mitigation Measures

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### Part 4.6: Authorities, Policies, Programs, Resources, and Plan Integration

Part 4.6 includes three (3) subparts:

- **Authorities, Policies, and Programs** - Cross referencing relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding existing authorities, policies, and programs in the region and specific information about the jurisdiction's participation and continued compliance in the National Flood Insurance Program (NFIP)
- **Capabilities and Coordination** - Cross referencing relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level and specific information about the jurisdiction's available resources
- **Plan Review and Integration** – Identifying plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan

### Authorities, Policies, and Programs

Section 1.3: *Existing Authorities, Policies, Programs, and Resources* of the NJ4 HMP Regional Hazard Mitigation Plan summarizes relevant authorities, policies, and programs related to hazard mitigation in the region including the NFIP.

Continuing municipal participation in the NFIP as part of the implementation of the NJ4 HMP by the municipality, includes:

- Involvement of Floodplain Manager / Administrator during the NJ4 HMP implementation process
- Commitment to adopt updated FIRMs and evaluate / update the municipality's Flood Management Plan and/or Ordinance as appropriate per recommendations in Section 4.6 of the NJ4 HMP Regional Hazard Mitigation Plan

### Capabilities and Coordination

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. Section 1.3: *Existing Authorities, Policies, Programs, and Resources* of the NJ4 HMP Regional Hazard Mitigation Plan includes summary statements regarding regional resources and the impact of resource limitations on the overall approach to the NJ4 HMP mitigation strategies. Section 4: *Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities and coordination at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation

### Plan Review and Integration

Specific documents obtained during the plan update process from the Municipal Working Group include:

- Emergency Operations Plan – Base Plan (2012)
- Flood Damage Prevention<sup>5</sup>
- Master Plan Reexamination Report (2008)
- Stormwater Management Plan (2006)
- Zoning Map (2007)

Table RP.4-4 in *Section 4.6: Plan Review and Integration* of the NJ4 HMP Regional Hazard Mitigation Plan identifies the primary plans and documents collected from each of the participating municipalities. In addition, Annex E.2 provides a complete list of all the plans and documents collected from the participating municipalities.

Section 4.6 also includes the results of reviewing the primary plans and documents to determine the extent to which these documents reflect up-to-date hazard risk and mitigation. In addition, Section 4.6 includes recommendations for integrating the results of the NJ4 HMP, including hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level that are relevant to all participating municipalities and incorporated by reference in each of the jurisdiction-specific Appendices including:

- Hazard Assessments
- Emergency Operations Plans
- Floodplain Management Ordinances
- Master Plans and Reexamination Reports
- Other plans and documents

The plan maintenance process includes a commitment to review and follow these recommendations during future scheduled updates of these various documents as considered appropriate by the Working Group and the governing body of the municipality.

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<sup>5</sup> <http://www.bwhnj.com/borough-ordinance.html>

## Attachment A: Public Review Comments

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The following comments were received during the public review of the Woodbury Heights Borough Municipal Appendix:

**Table GC.24.A-1: Public Review Comments**

Comment Date and Time	Comment	Response
December 8, 2014 @ 4:24 pm	Suggestion of having an additional critical facility serve as an alternate EOC. Designated EOCs are in close proximity to Conrail crossing and could be impacted should a train derail or chemicals be released.	Woodbury Heights Borough identified the Community Center as an additional alternate EOC.

*Note: As of April 17, 2015, no other public review comments were received for the Woodbury Heights Borough Municipal Appendix.*

## **Attachment B: Adoption Resolution**

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Following this page is the Adoption Resolution for the Woodbury Heights Borough Municipal Appendix as approved by the Woodbury Heights Borough Council.

## **Attachment C: Approval Letter**

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Following this page is the Approval Letter for the Woodbury Heights Borough Municipal Appendix.