WASHINGTON TOWNSHIP (Burlington County)
OFFICE of EMERGENCY MANAGEMENT
NATURAL HAZARD MITIGATION PLAN

(Update and Amendment to Plan dated January 31, 2007)

Burlington County Multi-Jurisdictional
HAZARD MITIGATION PLANNING PROJECT

I. BACKGROUND INFORMATION

February 5, 2013/Township Resolution # 2013-27

NATURAL HAZARDS

The following natural hazards within Washington Township are recognized as having significant potential to be addressed in the hazard mitigation plan at this time, and can be categorized into 2 general groupings:

1) Hurricanes, Coastal Storms *("Northeasters'")** ,
Flash-Flooding due to Extreme Rainstorms and
Extreme Wind Events during storms **
and associated Tidal and Small-Stream Flooding, Storm Surge, Heavy Precipitation, Straight-Line Winds, Winter Storms/Ice Storms and the possibility of storm-generated Tornadoes and Water Spouts.

* Note 1: While hurricanes are generally considered to be synonymous with natural hazards along the shore, coastal storms pose another significant weather condition. While the hazards of hurricanes involve extreme winds, heavy rainfall and potential storm surge, other non-tropical coastal storms pose the risk of prolonged tidal inundation and high winds. There is also the possibility of heavy rainfall, which may involve snow and/or ice storms during the winter season. These two categories of weather events have distinctions with respect to natural hazards and emergency management within the municipality.

** Note 2: While extreme winds are generally considered to be associated with hurricanes and tornados, damaging conditions can occur during other types of weather events – including thunderstroms accompanied by straight-line winds. Although the impacts can be localized, the damage can be quite severe to structures, and also the local highway system in this forested region – where down trees and utility lines will block both public traffic and emergency access. Impacts will be complicated when the wind damage occurs in conjunction with heavy rainfall and flooding – which also affects the highway system.

- Hurricanes are typically fast-moving and generally of Category 1 in the latitude of the

New Jersey coast. They are associated with late summer and early fall, and are relatively infrequent in this area on an annual basis. Due to the inland location of the municipality, the potential for extreme winds and storm surge is much less than along the immediate ocean coastline. Wave runup, overwash and velocity are not local flooding factors, although sustained on-shore winds and wave action will contribute to tidal flooding in back-bay areas along the shore, including the Mullica River and its tributaries.

- "Northeasters'" typically pass along the coast more slowly, and affect the tide level over several days - resulting in progressive flooding during a series of high-tide periods. Prolonged winds of gale strength are typical, and occurrence may extend from fall to early spring months. Heavy precipitation also may lead to small-stream flooding, which contributes to flooding situations when the drainage interacts with tidal flooding in downstream areas. During the winter months when temperatures are cold, associated hazards may involve blizzard conditions, heavy snowfall, icestorms and freezing of surface waters in flooded areas. During the 1991/92 season, a series of three coastal storms impacted the area. More recently in October/November 2012, Hurricane Sandy tracked along the coastline and became a non-tropical storm retaining hurricane characteristics and developing northeaster' features that affected South Jersey – with Washington Township on the northern side of the storms inland path. Severe tidal flooding coupled with full-moon astronomical conditions and storm winds significantly affected the communities along the Mullica River, with severe damage to floodprone homes and businesses. Based upon currently available information, flooding from Hurricane Sandy appears to have been comparable to tide levels that previously occurred along the Mullica River during the hurricane of September 1944 and the northeaster' of November 1950.

Flash Flooding: Extreme rainstorms pose the risk of small-stream flooding, which is generally localized in impact when it occurs within the Township - when compared to the regional hazards from hurricanes and coastal storms. Such weather events are generally associated with intense thunderstorms that produce deluges over short time periods and over small areas or storm paths – although intense rainfall also may be associated with hurricanes and coastal storms. Thunderstorms are typical of summer weather patterns, and may be intensified within the area due to the coastal influence of the interface between land-sea breezes. Such weather events are highly unpredictable and may involve short time periods for warnings - when compared to long-range forecasting that is now available for larger weather systems and storms. Advance warnings of flash-flooding typically involve less than 24-hours notice, and may not be available for storms with localized extreme behavior.

The Hazard Analysis (BP/A-6) of the Emergency Operations Plan indicates Dam/Levee Failure to be a technological hazard that poses a moderate risk to the area. However, the natural hazard of flash-flooding due to extreme rainstorms poses the related risk of dam/levee failure due to earthen construction and maintenance condition. Emergency Action Plans have been received from NJDEP only for Batsto and Harrisville Lakes.

While most of the municipality is undeveloped with porous sandy soils, such storms do impact the area. In July 2004, extreme rainstorms occurred to the northwest of the Township in headwater areas of the Mullica River, Batsto River and Wading River-West Branch. Drainage over a 24-hour period resulted in flashflooding of downstream areas of Washington Township. The principal effects occurred in the Batsto area of Wharton State Forest. Damage and threat of failure at the Batsto Lake Dam posed risks to the downstream County Route 542, as well as the potential hazard if a flood surge had crossed the Mullica River into the adjacent riverfront community of Sweetwater in Atlantic County.

More recently, two hurricanes caused extreme flash-flooding that affected portions of the Township variously. The remnants of Hurricane Irene in 2011 came on-shore to the east of the municipality near Great Bay in Ocean County, and caused extreme rainfall across South Jersey – including the Mullica River drainage. Flash flooding of the Mullica and Batsto Rivers washed over Route 542 at Batsto, damaging both Batsto dam, the County highway and both bridges at Batsto and Pleasant Mills. The Wading River-West Branch and Oswego River (East Branch) also flooded, and impacted Routes 563 and 679, as well as Harrisville dam – which was threatened but not damaged. During Hurricane Sandy, runoff of heavy rainfall was backed up by tidal flooding inundation of wetlands and streams of the Mullica River. This resulted in non-tidal flooding of Route 542 in the Great Swamp between Lower Bank and Wading River. This combination of both tidal and nontidal flooding, effectively isolated the three communities of Green Bank, Lower Bank and Wading River – until water levels receded.

Prior to Hurricane Sandy in October 2012, a localized thunderstorm was centered over the Wading River drainage in the center of the Township in early September 2012. Locally torrential rainfall produced similar flooding and damage to a 1970's event that also occurred over this drainage area. Over ten inches of rain occurred during a short time period in the Hogwallow area, flooding both the local rivers and cranberry bogs. Flooding closed highways (including damage to Evans Bridge on Route 563), damaged infrastructure of the cranberry agriculture and threatened the Harrisville dam. In the late 1970's, a storm path across the middle of the municipality followed the sea-breeze line from the southwest in Atlantic County near Batsto to the northeast in Ocean County near Lake Oswego and Sim Place. Although this primarily involved an area of State Forest, an intense deluge of 10+ inches of rain during a single afternoon, resulted in severe damage (and ultimate reconstruction) of the Harrisville Lake Dam and the risk of failure to the upstream Oswego Lake Dam. The adjacent bridge on County Route 679 was endangered, but not damaged.

Extreme Wind Events: Wind hazards are more-typically considered to be factors during hurricanes and tornados, which are of relatively low occurrence and magnitude within the township. Hurricanes in the northern latitudes are generally reduced to Category I

intensity and frequently transition into non-tropical coastal storms, although the impact of wind damage in association with flooding remains. Tornados occur infrequently in this region and generally are of F0 or F1 intensity. However, funnel clouds and straight-line winds associated with the storm systems may cause extreme winds and damage.

Due to the rural nature of the township and its limited community development, the potential for structural impact is relatively low – although the actual damage at point of impact may be severe. The broader hazard is the impact upon the highway system, not only for public traffic but also for emergency services. Roadways are typically narrow and tree-lined, creating the likelihood of blockage when winds topple trees and fell tree tops and branches into traffic lanes – at times with downed utility lines and poles. In recent decades, the potential effects of wind damage has been magnified by changes in forest health, due to variably widespread tree mortality and weakening due to various pest conditions – including gypsy moth, oak blight/decline and (most recently) pine bark beetle.

Consequently, there may be a cumulative danger from different hazards during storms that may combine tidal flooding, rainfall/flash-flooding and wind damage. During such events, emergency response and public safety is comprised by community isolation, both internally within the township, and externally when mutual-aid from outside agencies is cutoff. Significantly for emergency-medical services, access to basic and advanced-care medical facilities in adjoining Atlantic and Ocean Counties, as well as northern Burlington County, may be cut-off both to ground transport as well as aerial medical services. This situation was demonstrated during Sandy Hurricane, when all of the weather hazards combined and became interrelated with respect to both damage and public safety.

The Township was on the northern fringe of a *derecho* storm that impacted Atlantic County with severe winds and thunderstorms during September 2012. While physical impacts were relatively low within the municipality, utility services were compromised – particularly for communications services, that extended beyond hard-line wire networks to relay towers/systems for cell-phone, internet services and emergency radio communications. Wind damage and utility disruptions followed during Hurricane Sandy in October/November, similarly demonstrating the technological impact of natural weather hazards on the electrical-power and communications systems of modern society. Of particular concern to local agencies for emergency response, is the impacts not only upon emergency communications systems, but also disruption of 9-1-1 reporting services.

The Hogwallow area was also the center of a severe straight-line wind event during a thunderstorm in the summer of 2011. While of limited extent, severe structural destruction and crop damage occurred in the core agriculture area of the Township. The thunderstorm that spawned these winds, as well as an unconfirmed tornado in an adjacent remote forest area, appear to have again been associated with the line of sea-breeze

influence that bisects the municipality.

2) Wildfires in Forest, Brush, Grassland and Tidal Marsh ***

that pose the hazard of major forest fires or conflagrations in the Pine Barrens, or
pose risk to the Wildland-Urban Interface and
other life safety and property exposures -
including Agricultural and Recreational Areas

*** Note 3: Phragmites Reedgrass has become an invasive species in the tidal marshland along the Mullica and Wading Rivers within the Township. Due to the heavy fuel loading in the thick, tall grassy vegetation, this constitutes a high-danger type of wildland cover when forest fire danger is high and tide levels are low. The hazard is greater where the riverfront communities are bordered by this type of marshland. Customary strategy and tactics for wildfire suppression and protection are generally limited by the wetland terrain, which restricts access and the use of firefighting vehicles.

Wildfire danger varies seasonally on a yearly basis, and is cyclical over one or more decades in response to weather patterns and climate. Fire behavior is aggravated during low humidity, high winds, high temperatures and drought conditions. Peak fire danger is typically during the spring fire season, that extends from mid-March to mid-June. Depending upon weather conditions, a secondary fall fire season occurs in October and November. Drought conditions result in summer fire seasons, and may aggravate fire danger when climatic drought extends into either spring or fall seasons.

The most recent large wildfire within Township occurred in 1961, when a fire spread out of Mullica Township in Atlantic County, crossed both the Mullica and Batsto Rivers and threatened Green Bank and several small adjacent communities before being controlled. This followed the west-to-east fire corridor that was burned over by a 1930 conflagration, that originated in near Ancora (Atlantic County), burned over the Mullica/Batsto Rivers and burned across much of the Township – before spreading across the Wading River and into Bass River Township. A major fire in Woodland Township in 1982 was contained after burning over the northern portion of Penn State Forest within Washington Township. Several other major fires during the 1990's threatened to spread into the municipality from adjacent areas of Atlantic County and from Bass River Township, but were contained.

Wildfires in tidal marshland along the Mullica River have not posed fire problems within this municipality in recent decades; however the potential danger in this fuel cover has been demonstrated in the 1980's by incidents and threats to property in adjacent Galloway Township and along the Bass River at New Gretna. This will be an increasing hazard as short-grass marshland and freshwater wetlands continue to be replaced with the heavy fuel-loading of the invasive *Phragmites.*

Other Natural Hazards

The Hazard Analysis (BP/A-6) of the Emergency Operations Plan also indicates Earthquakes as a natural hazard, however this is considered to pose a negligible risk of unknown frequency and predictability. An earthquake centered in Virginia, caused tremors that extended into the municipality in 2011 – with no damage. There is no other record of an earthquake or related tsunami affecting the area. This hazard consequently is not considered to have a significant potential to warrant mitigation in this plan.

During 2006, testing of private wells pursuant to the Private Well Testing Act of New Jersey indicated the presence of radon concentrations in groundwater that resulted in a public health advisory being issued for Washington Township. Available information indicates that the municipality has been variously designated as either tier # 1 high or 2 for moderate risk. Radon is a potential natural hazard due to the apparent interrelationship of geology and geography to concentration levels in groundwater - which is the primary source of private and public water supplies within the municipality. Although the risk is at a potential broad-scale, it is readily mitigated through water quality testing and the use of available purification systems. This has been the subject of a public information program by the County Health Department in cooperation with Township Committee and local Health Board. This hazard consequently is not considered to have a significant potential to warrant mitigation in this plan.

LAND USES

The municipality is primarily open-space in State ownership of the Park Service and Division of Fish and Wildlife, and approximately 85% of the land is within Wharton and Penn State Forests, and the Swan Bay Wildlife Management Area. Additional large acreages of privately-owned open space are within a number of cranberry/blueberry farms, which typically contain expanses of forest that are appurtenant to the bogs and fields of cropland.

This jurisdiction also is within the Preservation Area of the regulatory region of the State's Pinelands Commission, and future development is severely restricted. The potential for negligible increase in the small resident population of approximately 600 persons (2010 Census), is generally restricted to three small Village zones at Green Bank, Lower Bank and Jenkins. There are several small areas of Neighborhood Business and a single Industrial zone within the Village areas, and there is negligible development potential due to existing situations of property ownership/management, land availability for expansion, environmental restrictions and limited economic viability - particularly for small-scale commercial entities.

The publicly-accessible State lands and waters are in the core of the Pinelands region for open-space preservation and outdoor recreation, that includes camping, hiking, boating, kayak/canoeing, eco-tourism, off-road motoring and sightseeing of natural and historic features. Activities take place at developed facilities and designated sites, on navigable tidewaters and across remote wildland areas and streams. The Batona Hiking Trail extends from the trail head at

Batsto both to Bass River State Forest in the east, and to Brendan T. Byrne State Forest (formerly Lebanon) to the north. Three privately-owned campgrounds are located near the communities of the Township, and contain hundreds of campsites that are occupied either seasonally or on a quasi-permanent basis. Campers at these businesses frequent the nearby State lands and facilities. Local canoe liveries as well as private campgrounds, also provide kayak and canoe rentals on the four inland rivers that traverse the Township - and which are the primary canoe trails within the Pine Barrens.

Recreational land uses and open-space preservation involving State Forests and a private campground include several large lakes that were created with earthen dams in the past for historic industries of the Pine Barrens. There is a risk to flash-flooding that may occur during extreme rainstorms, although the extent and location of the storm paths will dictate which watersheds and associated dams are at risk. Most of the dams are on State Forests, where there is limited risk to improved property due to preserved open space. Public safety risks do exist however, due to recreational activities that include canoe trails, camping areas and day-use recreation at the lakes and along the rivers. The Lake Oswego Dam on Penn State Forest also provides water supply and control for the adjacent cranberry agriculture at Hogwallow. Uncontrolled or excessive water releases from the Lake pose risks to cranberry bogs and crops, as well as the downstream Harrisville Lake Dam (Wharton State Forest). The Batsto Lake Dam (Wharton State Forest) is in the center of the Batsto Historic Village, and a number of historic structures are in flood-prone areas. Downstream risks include County Route 542 in the area of mile markers 8 and 9, and the low-lying riverfront community of Sweetwater on the south side of the Mullica River in Atlantic County. Belhaven Lake is privately maintained for a private campground near the center of Green Bank. Downstream risks include the adjacent County Route 542 near mile marker 12.

ENVIRONMENTAL CONSIDERATIONS

The geography of the Township is inherently associated with the potential hazards of the natural environment. These reflect both the Pine Barrens in the core of the southern portion of the State, and the coastal shore with the large tidal tributaries that penetrate inland. This setting creates the risks to life and property that are considered to be significant for the current hazard-mitigation plan. The emergency management and mitigation relationships are as follows:

1. Hurricanes and Coastal Storms affect the tidal rivers that border the Villages of Green Bank and Lower Bank, and the community of Wading River in the southern portion of the Township. Beyond the direct danger to residents, homes and businesses, additional flooding/storm considerations include:

    - Local traffic and access on streets and highways within the Villages and communities of the Township
    - Regional traffic between the Township and adjacent areas that provide essential community support (e.g., shopping centers, fuel stations, public utility services) and critical emergency services (e.g., hospitals/medical centers,

emergency mutual aid, Burlington County seat of government).

- Beyond the flood potential and hazard, the local roads and regional highways in this rural area are susceptible to blockage and closure from falling trees and limbs in this heavily forested area. Related problems occur due to the routing of utility lines for electrical and communications services, which originate in adjacent counties and are equally susceptible to downed trees and limbs.

- Impacts upon roads and highways have a direct effect upon emergency services by local fire and medical providers, as well as law enforcement services from the NJ State Police - who are headquartered at Tuckerton in Ocean County. Community evacuation to the single Public Shelter in the Green Bank School is also subject to such impacts. Highways including Routes 542 and 563 also are designated Hurricane Evacuation Routes of Burlington County, and also are intended to complement routing in the adjacent counties of Atlantic to the south and Ocean to the east.

- The relative isolation of this rural area, particularly with respect to the remainder of Burlington County - with the exception of the adjacent Township of Bass River, to the east. Mutual-aid emergency services from adjacent communities, as well as support from County resources, is also affected by impacts upon roads and highways. No medical facilities are located within the Township, and available hospitals are in Atlantic and Ocean Counties, and at the County seat in Mount Holly.

2. Flash-flooding due to extreme rainstorms poses various types of hazards to life and property due to the risk of dam/levee failure. The proximity of the Township to the shore, creates summer weather that is affected by land-sea breezes. This may in-turn locally intensify thunderstorms and rainfall from storm cells and paths that occur within the municipality. While the risks tend to be localized, the predictability of such storms and their hazards is limited and short range. Public safety risks involve recreational facilities and users of the associated rivers and lakes. Property risks include bridges on County highways that are adjacent to dams, cranberry agriculture that utilizes lake water supplies and controls, and the historic Batsto Village. Local communities generally are exposed to limited hazards, although there is the potential for risk to the Sweetwater area from Batsto Lake Dam and to the Bull Creek area in Green Bank near Belhaven Lake.

3 Extreme wind events are a compounding factor that is generally associated with other natural weather hazards of the township, ranging from broad-scale hurricanes and coastal storms to localized thunderstorms that may be aggravated by the boundary of coastal sea-breeze influence that extends into the municipality. While wind damage may be localized and site specific in extent, the cumulative affects of

both water and wind hazards pose risks both for public safety and emergency management.

4. Wildfires pose hazards to the landward sides of the two river-front Villages, and to Jenkins Village - which is essentially surrounded by the Pinelands of Wharton State Forest. Marshland hazards also are associated with Lower Bank and the down-river community of Wading River. Depending upon the geographical location and fuel cover, the other smaller residential settlements, isolated homes/cabins, as well as agricultural and recreational risks, are generally exposed to fire danger that is an inherent natural hazard of the Pine Barrens forests. Hazard areas may be considered to be in two forms: Fire Corridors and Mixed Interface Areas.

   (1) Fire corridors are paths for wildfire spread based upon forest cover type, natural fuelbreaks and weather conditions that prevail during periods of fire danger. Corridors exist within the political boundaries of the Township, and extend into the municipality from adjacent Atlantic County as well as neighboring areas of Burlington County to the north and east. The last conflagration spread into the Washington Township in 1961 from Mullica Township to the west.
   (2) Mixed Interface Areas consist of homes and properties that are intermingled with hazardous wildland fuels - whether the cover is forest, brush, grassland or marsh. Due to human presence and activities, fire ignitions from accidental, careless and intentional causes are likely in the associated fuel cover. Conversely, wildfires readily endanger life safety and property exposures.

   Beyond the direct danger of fire to life and property, additional wildfire considerations include:
   - Local Fire Companies have limited resources of personnel and equipment, and depend upon mutual aid for additional resources during incidents involving structure fires, property protection and major wildfires. There is limited fire engine capability for off-road wildland firefighting.
   - The NJ Forest Fire Service is the primary agency that is responsible for wildfire prevention and suppression on both public and private lands within the Pinelands. Critical pre-suppression activities involve hazard reduction through prescribed burning that provides strategic fuelbreaks and protective buffers.
   - Fire incidents in remote locations involve critical time factors that affect response and mutual aid for fire suppression and protection.

   - Dangerous fire behavior may involve fire spread that spans distances in terms of miles per hour, and involves areas of hundreds of acres per hour. In advance of a spreading fire front, smoke drift may cloud ground-level visibility, impact emergency response and evacuation, endanger traffic and obscure secondary ignitions of spotfires by windblown embers - a

quarter-mile or farther from the main body of the fire.

- Recreational visitors in wildland areas may be isolated from alert/warnings, safety zones, evacuation and protection. Visitors to the Pinelands also may be unfamiliar with wildfire danger and safety precautions. Due to the very-limited emergency resources within the local communities, the shelter, reception and care of visitors is not feasible. The Emergency Operations Plan provides for the return of such non-residents to their home communities, or evacuation to safety zones outside of the municipality. Public safety functions are performed by the NJ State Police - Tuckerton Station as the law enforcement agent for Washington Township. Additional law enforcement functions are provided by the State Park Police from Wharton State Forest - which is headquartered within the Township at Batsto and Green Bank; and from Bass River State Forest - which has direct jurisdiction for Penn State Forest.

EMERGENCY MANAGEMENT FACILITIES

Two inter-related aspects of emergency management involve municipal facilities: Emergency Operations Center and Public Shelter. Although local municipal and emergency management resources are inherently limited, conditions have significantly improved with the completion of the new Green Bank Elementary School, and the development of the former school building into the new Municipal Building – which houses the Emergency Operations Center. Both of these facilities are located in proximity to the adjacent Green Bank Fire Station 451 and Green Bank Ambulance Squad 459; all of which front on County highway Route 563 (north-south), in proximity to the intersection in Green Bank with County Route 542 (east-west).

A. The new school provides a facility for public sheltering, reception and care of residents - including auxiliary electrical power for emergency use. The shelter facility was activated during both Hurricane Irene in 2011 and Sandy in 2012. Further planning in this area is pending, including auxiliary use as an alternate EOC when electrical power is disrupted to the municipal building. Full certification to Red Cross standards does not conform to the standard for an air-conditioning system, which is not available during electrical outages and back-up generator service. This is not considered to be a significant issue for emergency-management consideration and use of the building.

B. The remaining structure from the older school building has been developed into the Municipal Building as the administrative facility for the local government. This provides enhanced facility space and capabilities for emergency management functions and support to response operations. Emergency back-up power is not currently available, but is under consideration.
The Community Senior Citizens Center is a third accessory facility which provides secondary functions for emergency management. Located nearby on River Road in Green Bank, it provides a satellite facility for the American Red Cross – as a local supply base and building space for training/meetings. The building also has limited capacity for shelter-reception-care functions.

An additional issue for emergency response agencies, involves communications and interagency coordination. Burlington County Central Communications has upgraded fire and medical radio communications to a UHF system, although coverage gaps exist in the relay tower system - particularly in the southern and western fringes of the Township. Although 9-1-1 dispatching also was upgraded, emergency reporting* and general service via cellular telephone is not possible in portions of the Township due to remoteness and tower coverage. Also, mutual aid from Atlantic and Ocean Counties use radio systems with various VHF and UHF networks. NJ State Police utilize UHF, while State Parks, Forestry and Wildlife use the NJDEP VHF system. Communications at emergency incidents remains a critical function for both individual agencies and for inter-agency cooperation.

> * Note: 9-1-1 calls originating from cell-phone users in the area, may pose alerting problems for BCC dispatchers due to intermittent signal strength, rural situations without locatable addressing or remote locations that the caller is unfamiliar with - or lost in. A greater recent development of concern, is the forwarding of local cell-phone 9-1-1 calls to local police dispatchers in adjacent municipalities/counties – rather than directly to Burlington Central Communications.

INTER-JURISDICTIONAL CONSIDERATIONS

The jurisdictional responsibilities and capabilities of other agencies are a key consideration in inter-governmental preparedness and response to natural emergencies.

1. Washington Township Board of Education

> The Green Bank Elementary School is under the administration of the local Board of Education - which is represented on the Local Emergency Planning Council by the School Administrator. Township Emergency Management recently contributed to the development of School Safety and Security Plan (September 2012) by the School District.

2. Burlington County Office of Emergency Management

> Due to limited resources and technical capabilities, critical technological support is needed by the Township OEM. The County OEM has the capability to provide GIS and mapping support for pre-planning and preparedness, and has already provided mapping assistance in the 2010 update to the EOP.

3. Burlington County Highway Department

> County Highways provide regional traffic arteries both within Burlington County, as well as to the adjacent areas of Atlantic County and Ocean County - either directly from the

municipality, or through Bass River Township. Certain County routes also serve as local streets within Village areas. The capacity and maintenance of these roadways is critical to local emergency management and responders during incidents.

3. NJ Forest Fire Service

The Forest Fire Service is the State agency that is responsible for the control and prevention of wildfires and property damage. Beyond fire suppression functions, the agency performs pre-suppression activities that include pre-planning, inter-agency cooperation and hazard reduction activities. Due to the extent and location of forest cover under public ownership within the Township, prescribed burning is conducted extensively on State Forests. The FFS also administers the fire permit and hazard reduction programs for burning activities on private lands, which involve projects that supplement the State program on a number of private properties. The FFS also administers several programs for local assistance as funded by Federal grants through the National Fire Plan, including *Firewise* communities, hazard mitigation and fuel management for WUI communities. Close cooperation and coordination is essential during fire emergencies, involving suppression activities by FFS, property protection by local Fire Companies and public safety functions by the State Police and State Park Police. A Community Wildfire Protection Plan: An Action Plan was cooperatively developed by the Township and Forest Fire Service in November 2011.

4. NJDEP Dam Safety Commission

The Dam Safety Commission of the NJDEP is responsible for the administration and preparation of Emergency Action Plans (EAP) for regulated dams/levees. To date, EAP's have been received from the State Park Service facilities for Batsto Lake and Harrisville Lake. No reports have been received for Belhaven Lake which is privately maintained in Green Bank or for Lake Oswego in Penn State Forest.

REFERENCE MATERIALS

Emergency Operations Plan (2010)

Basic Plan BP, including:

Section IV - Situation

BP/A 4 - 2	Proclamation Declaration - Flooding	
- 3	- Forest Fire	
BP/A 6	Hazard Analysis	
BP/A 11	Map List	
	BP/A 12	Emergency Management Services (oversize map)
	BP/A 13	Communities
	BP/A 14	Remote Woodland Structures/Private Camping Areas

BP/A 15 Agricultural Areas
BP/A 16 Recreational Facilities and Areas
BP/A 17 Canoe and Hiking Trails
BP/A 18 High-Danger Wildfire Hazards
BP/A 19 Moderate-Danger Wildfire Hazards
BP/A 21 Hurricane Evacuation Map – Burlington County (BCOEM)
BP/A 22 Storm Surge (BCOEM)
BP/A 24 Washington Township Floodprone Areas (BCOEM)
BP/A 25Washington Township Floodprone Parcels (BCOEM) HUD

Federal Insurance Administration - Flood Hazard Boundary Map H - 01-28, Township of Washington, Community No. 340117A: Map Index and 7 panels

(note: updated flood hazard maps and base level elevations are currently in preparation, and scheduled for adoption by FEMA in 2013)

Damage Assessment Annex DA

DA/A-14 Rapid Assessment Form

Evacuation Annex EV

EV/A 1 Evacuation Routes (map)
EV/A 1 - 1 Hurricane Evacuation Route Map (BCOEM)
EV/A 6 Evacuation Facilities and Locations (map)
EV/A 8 Evacuation Groups with Special Needs
EV/A 13 SOP's for Wildfire Evacuations
EV/A 14 Route-Alerting Addresses

Fire-Rescue Annex FR, including:

FR/A 5 Property Protection - Interface Wildfires
FR/A 9 Fire & Rescue SOP's for Brush, Forest and Wildfires

Public Works Annex PW

PW/A 8 Emergency Clearance Priorities for Highways, Streets and Facilities Access
PW/A 9 SOP's for Flooding and Storm Emergencies

<u>Washington Township Planning and Zoning Board</u>

Washington Township Master Plan (reexamination) - January 2007, including maps*:
Land Use and Regulatory Boundaries (2 maps*)
Village Land Use Capabilities (3 maps*): Green Bank, Jenkins, Lower Bank
* Note: prepared in GIS format by NJ Pinelands Commission.

Land Development Ordinance 3- 1983 (as amended),

section 13.5 - Fire Hazard Management Standards

Township of Washington

Code of the Township of Washington, New Jersey (2011):
35 – Fire Companies
62 – Officers and Employees: article II – Director of Public Safety
236 – Flood Damage Prevention
275 – Land Development
303 – Naming of Streets, Numbering of Buildings

Resolution 2003-71 - A resolution supporting the controlled burning of fuelbreaks and protective buffers within Washington Township, Burlington County. November 11, 2003.

Washington Township School District

School Safety and Security Plan (September 2012)

Burlington County Office of Emergency Management

"Disaster Preparedness Information for Visitors to the New Jersey Pinelands"
(informational brochure)

Burlington County Fire Chiefs' Association - Wildland Urban Interface/WUI,
Standard Operating Guidelines for Burlington County

Washington Township EOP and maps available in GIS format

NJDEP Bureau of Forest Fire Management

Informational brochures:
"Protect Your Home from Wildfire"
"Protect Your Marshland Home from Wildfire"
"Prescribed Burning in New Jersey's Forests"

Prescribed Burning as a Management Tool (October 2, 2003) and maps:
Conceptual prescribed burning plan for hazard reduction, Wharton State Forest,
Batsto-Hawkins Area (September 30, 2003)
Exposures at Risk from Wildfire, Wharton State Forest,
Batsto-Hawkins Area (plus attached listing June 11, 2004)
Paths of large wildfires, 1925 to present, Wharton State Forest,
Batsto-Hawkins Area (September 30, 2003)

Washington Township, Burlington County - Community Wildfire Protection Plan: An Action

Plan for Wildfire Mitigation; 2011-2021 (November 2011)

Miscellaneous informational publications

National Wildland/Urban Interface Fire Protection Program:
"Fire protection in the wildland/urban interface: everyone's responsibility"
"Wildland/urban interface fire hazard Assessment methodology"
"Developing a cooperative approach to wildfire protection"

National Fire Protection Association, US Forest Service, US Department of the Interior, National Association of State Foresters and US Fire Administration -
"Building interagency cooperation - a six-step process to help you improve your fire protection effectiveness"

NJDEP – State Forest Service

Community Forest Management Plan for Washington Township, Burlington County; State of New Jersey, NJ Forest Service Grant # PF11-048 (January 2012; prepared by Land Dimensions Engineering)

NJDEP - Radiation Protection Program

Current information available through *http://www.nj.gov/dep/rpp/radon.*

September 26, 2006 correspondence from Burlington County Health Department to Washington Township BOH re Private Well Testing Act.

III. POTENTIAL MITIGATION LOCATIONS

February 5, 2013

A. Potential Locations for Coastal-Flood Hazard Mitigation

Appendix 14 – Route Alerting Addresses in the Evacuation Annex of the 2010 update to the Emergency Operations Plan (EV/A-14, 5/21/10) provides addresses for planning purposes involving route alerting and evacuation warning during the designated hazards. On the basis of currently available OEM information and FEMA guidelines, the following addresses may be considered as possible locations for hazard mitigation for coastal flooding, subject to site-specific survey and evaluation for developed residential and business properties that have been delineated within the flood hazard area and elevation.

Lower Bank:

River Road -

2112
2115
2117
2119
2121
2123
2125
2133
2201
2205

Charles Avenue -

2
4

Green Bank (none currently determined)

Wading River (none currently determined)

B. Key to Reference Maps (attached)

Delineation of locations is for planning purposes only.

Listing of locations is not prioritized.

Area locations are referenced by alphanumeric identifiers.

Locations for Flooding mitigation are only in regard to Streets/Highways and Dams/Levees..

Delineated locations are for reference purposes only, and
are not intended to indicate either flood water levels, potential surge or return intervals.

Locations for Wildfire mitigation are only in regard to Property Exposures.

Delineated locations are for reference purposes only, and
are not intended to indicate relative levels of hazard or risk.

Types (2) of locations:

1. State-owned land prescribed burning and fuel management (cross-hatched area)

2. Private land for Wildland-Urban Interface (WUI) “Firewise” mitigation and and hazard reduction of forest fuels (area outlined with dashes)

FLOODING (2 maps: Green Bank and Lower Bank-Wading River) *

A. Route 542 between Green Bank and Batsto near Crowleys Landing/mile markers # 10 to 11 - tidal flooding.

B. Route 542 between Lower Bank and Wading River near mile # 16 in Great Swamp - non-tidal rainfall runoff, may be aggravated by tidal flooding from Mullica River, backing up through the swamp between Turtle Creek Road and Lower Bank

C. Route 652/River Road in Lower Bank between Charles Avenue and Mullica River - tidal.

D. Route 652/River Road at northern approach to Lower Bank Bridge - tidal.

E. Route 542 at western approach to Wading River bridge near mile marker # 17 - tidal

F. Flooding (tidal) of highways in adjacent jurisdictions that have direct effects upon local highways, streets and emergency services*.

1. Atlantic County Route 563 approaching Green Bank Bridge from Weekstown/

Mullica Township

* Emergency services: Fire-Rescue and Emergency Medical mutual aid from Weekstown and Mullica Township.

2. Atlantic County - Lower Bank Road ("2 Mile Stretch") approaching Lower Bank Bridge/Route 652 from Egg Harbor City/Atlantic County Route 563.
   * Fire and EM mutual aid from Egg Harbor City.

3. Burlington County Route 542 in Bass River Township at Merrygold Creek.
   * EM access from Washington Township via State Route 9/Garden State Parkway to Atlantic City Medical Center.
   Fire and EM mutual aid via Route 9 from New Gretna and Ocean County
   Law enforcement response via Route 9 from NJ State Police - Tuckerton Station.

* Note: flooding hazards also exist at the following locations but are not considered to currently warrant mitigation due to apparent issues of feasibility and/or cost-effectiveness:

a. Lower Bank (tidal):
   I. Old Church Road at Cakes Sprato (Debow Lane – Island Road)
   II. River Road cul-de-sac (Bell Lane – Abes Island)
b. Wading River – Turtle Creek Road (tidal) near Old Swan Bay Road (# 39 - # 60)
c. Jenkins/Maxwell (non-tidal):
   I. Route 563 at Wading River – West Branch (Evans Bridge near mile 29)
   II. Route 563 at Little Hawkin Run near Hogwallow (near mile 32)

<u>DAMS/LEVEES</u> (2 maps: Mullica River tributaries and Oswego River)

Note: potential risks are listed below.

A. Batsto Lake, Batsto River, Wharton State Forest

Batsto Historic Village
County Highway 542
Sweetwater (Atlantic County)
Crowleys Landing Recreation Area, Wharton State Forest

B. Belhaven Lake (Bull Creek), Belhaven Lake Resort Campground, Green Bank

County Highway 542
Bull Creek area of Green Bank

C. Lake Oswego, Oswego River (Wading River - East Branch), Penn State Forest (Washington and Bass River Townships)

Pine Island Cranberry Company (Haines & Haines - Hogwallow)
Rutgers Cranberry & Blueberry Research Center

Oswego River canoe trail, Wharton State Forest
Harrisville Lake Dam (downstream)

D. Harrisville Lake, Oswego River, Wharton State Forest
(Washington and Bass River Townships)

Harrisville Lake Recreation Area, Wharton State Forest
County Highway 679
Oswego/Wading River canoe trails, Wharton State Forest
Bodine Field Camping Area, Wharton State Forest (Bass River Township)

WILDFIRE (5 maps)

Green Bank Fuelbreak and WUI Protection

A. State Prescribed Burning and Fuel Management

Tylertown

1. Maple Branch Road
2. Tylertown Feedstrip

Bulltown

3. Bulltown-Tylertown Road
4. Old Bulltown Field

Green Bank

5. Bulltown Road/Route 542
6. Route 542/Route 563

Heppard Field

7. Old Green Bank-Bulltown Road
8. Old Green Bank-Washington Road/Cedar Pond Feedstrip
9. Route 563

Maxwell

10. Maxwell-Friendship Road

B. Private WUI Firewise and Hazard Reduction

1. Tylertown

2. Bulltown/Old Bulltown-Maxwell Road

3. Bulltown mile # 1/Straight Road

4. South Bend Road (including Belhaven Lake Campground)

5. Route 563/Route 542/Lance Run Road

6. Route 542/Mile 14

7. Heppard Field

8. Maxwell (including Kowboy Korral)

9. Godfrey Bridge Camping Area - Wharton State Forest

Lower Bank Fuelbreak and WUI Protection

A. State Prescribed Burning and Fuel Management

1. Seaf Weeks Road

2. Route 542/Circle Piece

B. Private WUI Firewise and Hazard Reduction

1. Route 542/Old Church Road

2. Route 542/Seaf Weeks Road/River Road

3. Route 542/Circle Piece
(including Groff's Auto Salvage and Recycling)

4. River Road

Wading River WUI Protection

A. State Prescribed Burning and Fuel Management

1. Route 542 mile marker # 17/Ridge Road

2. Ridge Road/Wading River Cranberry Bogs

B. Private WUI Firewise and Hazard Reduction

1. Route 542

2. Turtle Creek Road (including Turtle Run Campground)

3. Wading River Cranberry Bogs (Cutts Brothers)

4. Old Wading River-Maxwell Road:
- Schroer cabin (Wading River)
- Wading River Bogs pumphouse

Jenkins Fuelbreak and WUI Protection

A. State Prescribed Burning and Fuel Management

1. Route 563 - Mile 30/Route 679

2. Godfrey Bridge Road

3. Route 563/Patten Lane

4. Route 563/Micks Lane

5. Lake Oswego Road/Rutgers Center

6. Rutgers Center/research fields

B. Private WUI Firewise and Hazard Reduction

1. Godfrey Bridge Road (including Wading Pines Campground)

2. NJDOC Pinelands Residential Center

3. Jenkins Village (including Micks Canoe Rental)

4. Micks Cranberry Bog

5. Route 563 Communications Towers

6. Lake Oswego Road (residences)

7. Lake Oswego Road/Micks cabin (Oswego River)

8. Rutgers Cranberry & Blueberry Research Center

Hogwallow-Speedwell Fuelbreak and WUI Protection

A. State Prescribed Burning and Fuel Management

1. Hawkins Bridge Road

2. Swamp Road

3. Lake Oswego/Bear Swamp Hill (Penn State Forest)

4. Deep Hollow Road/Breeches Branch (Penn State Forest)

B. Private WUI Protection and Hazard Reduction

1. Hogwallow
(including Pine Island Cranberry Company, Lee Brothers Cranberries and Pine Barrens Canoe Rental)

2. Speedwell
(including residences in Tabernacle Township and Lee Brothers Cranberries/Tree Farm)

3. Hawkins Bridge Camping Area - Wharton State Forest

4. Lake Oswego Recreation Area - Penn State Forest