

**Borough of Mantoloking  
Ocean County, New Jersey**

**FLOOD  
MITIGATION  
PLAN**

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BOROUGH OF MANTOLOKING  
FLOOD MITIGATION PLAN

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## **Borough of Mantoloking FLOOD MITIGATION PLAN**

### **1. INTRODUCTION**

The Borough of Mantoloking is located on the Atlantic Ocean Coastline in Ocean County, New Jersey, comprised of approximately 0.40 square miles of barrier beach. The Borough is geographically surrounded by bay and ocean waters, which each year presents a constant threat to this community from Nor'easters or northeast storms and tropical borne storm activity, introducing severe wave and flood impacts.

Mantoloking, along with hundreds of other eastern coastal communities, have been historically subject to flooding, beach erosion and many other associated problems, which require an aggressive approach to successfully manage infrastructure maintenance and disaster damage mitigation. This multi-faceted program implemented by Mantoloking to protect and maintain its infrastructure, natural features, and the public safety, welfare, and property of its residents, has been developed over many years and continues to improve annually with the implementation of improvements and the adoption of new municipal ordinances and resolutions in conjunction with assistance from outside public and private agencies. These activities have culminated with such recognition as:

- o First New Jersey Community with adopted Dune Ordinance.
- o First New Jersey Community to have Municipal Ordinance Adopted with US Fish Game and Wildlife for Sea Beach Amaranth.
- o Mantoloking Dune Ordinance used as State Model.
- o First Municipality in State to establish "Scarp Line" Ordinance recognizing and quantifying physical conditions as result of storm impact and erosion rates to determine new setbacks for ocean side.
- o First Municipality to adopt Annual Emergency Beach Contracts.
- o First quantitative GIS based geospatial analysis and assessment of susceptibility of the beach-dune system to storm damage and erosion.
- o First Municipality to initiate a Savings Program for Disaster Relief.

With each new year, Mantoloking will continue to pursue and improve upon methods to educate its residents, protect its coastline, manage its infrastructure and natural features, and efficiently prepare for, and recover from flood damage and natural disasters.

### **2. NATURAL HAZARDS - Source of Flooding Problems, History, Economic Impact**

Each year the Borough of Mantoloking is faced with the prospect of its extreme vulnerability to any of a number of storm events ranging from Hurricanes, tropical storms, Nor'easters, blizzards and lesser storms having high winds and associated wave impact and high tides. The geography of Mantoloking's barrier beach type setting consists of tidal waters forming on its western and eastern borders, with approximately 2.2 miles of oceanfront and approximately 3.0 miles of bay shoreline.

As a barrier beach the Borough acts as a haven for rare, protected and endangered species. Specifically the Borough's land mass acts as a barrier to protect the back bay area for rare birds and other marine creatures including various fish and shellfish. The primary protective feature of the Borough's land mass is its significant beach and dune system which has in the past provided habitat for the Piping Plover and such endangered plant species as the Sea Beach Amaranth.

The Borough's beach and dune system protects storm overwash into the back bay and thereby preserves the natural habitat for related wildlife and also the environment providing the natural cleansing of recreational waters in these areas. The Borough's vegetative cover on the majority of all dune systems helps to retain and limit wind transport of sands from entering the back bay area and preserves the marsh and wetland features. The Borough's dune systems are protected under adopted Ordinance No. 407 and other land use ordinances, which also provides a development limit line.

Mantoloking has consistently sought to improve the protection of its community and natural features through an aggressive approach that has evolved over many years, with increased efforts focusing in the wake of Hurricane Gloria in 1985 and more recent storms as evident in the 1995 storm of the Century and the Blizzard of 1996. It is the damage from events such as Hurricane Gloria, or the December 1992 Nor'easter and other annual storms classified as Class IV and Class V storms, which are the most severe of the Dolan-Davis scale, in conjunction with the constant beach erosion and increased tidal water elevations that occur during lesser storms that define Mantoloking's natural hazard. The problematic results of such events are identified from two (2) major sources:

1. The Atlantic Ocean on the east side of the barrier beach rises and floods over the beach at times of high tides and storms allowing severe surf to erode or inundate the island with associated property damage.
2. The tidal bay on the west of the barrier beach rises significantly at times of tidal events, storms, or prolonged northeast winds, causing flooding and associated damage.

The major threats faced by Mantoloking are hurricanes and coastal storms. These present three types of hazards: wind, storm surge, and rain. The following is a description of three hazards associated with these storms:

- a. High winds: A hurricane is defined by its wind speed. An organized system of this nature with velocities of more than 74 miles per hour is classified as a hurricane. These winds can blow roofs off of buildings and cause structural damage.

A related problem is tornadoes spawned by hurricanes, which will develop fast, inflict tremendous destruction, and vanish as fast as they appeared. It is impossible to predict tornadoes and where they will strike.

- b. Storm surge: This is a great dome of water caused by winds and pressure differences in the air. Areas are flooded by water that can be up to 18 feet higher than normal sea levels. The maximum storm surge is experienced north of where the hurricane's eye makes landfall. This surge, especially when coupled with the breaking waves, causes great destruction and accounts for 90% of hurricane deaths. Northeast storm events also create increased storm surge, impacting the island with severe flooding.
- c. Rainfall: Six to twelve inches of rainfall generally accompanies a hurricane. This causes flooding of streets before and during the worst part of a hurricane and as the storm passes. Flooding can be aggravated when drainage systems are blocked by hurricane-blown debris and back bay levels are

elevated.

### **Hurricane Categories**

Category 1: Winds 74-95 mph. Damage to shrubbery, trees, smaller structures, and some signs. Storm surge 5-7 feet above normal. Some damage to piers, exposed small craft, and low-lying buildings.

Category 2: Winds 96-110 mph. Some trees blown down. Major damage to smaller structures and signs. Some damage to building roofs and windows. Storm surge 8-10 feet. Considerable damage to piers, marinas, small craft, and low-lying buildings.

Category 3: Winds 111-130 mph. Large trees and many signs blown down. Substantial structural damage. Some structural damage to small buildings. Storm surge 11-12 feet above normal. In addition to water damage, structures severely damaged by waves and floating debris.

Category 4: Winds 131-155 mph. All signs blown down. Mobile homes destroyed. Extensive damage to roofing, windows, and doors. Storm surge 13-18 feet above normal water levels.

Category 5: Winds over 155 mph. Some complete building failures. Storm surge over 18 feet. Major damage to structures less than 15 feet above sea level within 500 yards of shore.

Associated with the identified problem sources are many complications that jeopardize Mantoloking's community and residents. Among the problems Mantoloking has endured in the past, is the severe flooding and beach erosion resulting in damage to public and private property, and the threat to the safety of residents and visitors, as well as the threat to the local environment and to the natural beauty of Mantoloking.

In recognizing these obvious threats to the community it was necessary for the Borough to take a preventative approach of annual maintenance projects under a program that would prepare the Borough for a natural disaster, such as a large scale Hurricane or extra tropical storm, while at the same time maintaining a staunch commitment to improve the overall quality of life for its residents.

In an effort to protect and preserve the Borough's shoreline, the Borough has spent a significant amount in coastal protection to alleviate flooding from both its Atlantic and Bayside shorelines. With each planned improvement the Borough stresses conformance to the American Disabilities Act (A.D.A.) requirements and has developed a firm relationship with the New Jersey Department of Environmental Protection (NJDEP), United States Army Corps of Engineers (USACE), U.S. and Fish, Game and Wildlife (USFGW), New Jersey Endangered and Nongame Species Program (ENSP) and FEMA which has been invaluable in addressing hazard mitigation and enhancement projects. As part of the Borough's annual self evaluation Mantoloking sets goals to enhance and implement its National Flood Insurance Plan, Community Rating System (NFIP/CRS) repetitive loss reduction plan and has had marked success in meeting its goals and reducing damages to municipal and residential property with anticipated future reductions to local flood insurance rates.

Mantoloking's economy is highly dependent upon resistance to flooding. The Borough's tax base depends upon home and property, and local flooding and flood damage can severely diminish property values. Accordingly, efforts to minimize flooding are critical to the financial success of the Borough. Mantoloking has been identified as a summer home community with most of the Borough consisting of single family detached homes that are used primarily as vacation residences. The Borough continues to be a community of summer homes, with 55 percent of the housing stock being used as summer homes.

A large scale flood and associated potential destruction of homes from an event such as a Class 3 or greater northeaster or hurricane could seriously damage the local tax base which provides a regular stipend supporting all Borough activities. The potential impact to the community from such a disaster not only could breakdown the tax base; but also has a subsequent effect on community recovery from lack of funds to effect repairs and rebuilding. Accordingly, flood protection is paramount to the Borough community.

Mantoloking's recent success in finding new ways to improve and protect its community continues to gain momentum while setting an example for its neighboring communities.

### **3. FLOOD MITIGATION PROGRAM EVOLUTION - Preparation of Plan**

Following severe storm impacts on the coast of Mantoloking, the Borough has expended significant funds to implement shore protection and enhancement projects. Each winter Mantoloking was enduring critical beach erosion and intermittent bayside flooding damage making it clearly evident that an organized effort to protect the community was necessary. Early coastal protection projects involved the assistance of the USACE, and the NJDEP. Over time, Mantoloking has more clearly defined its problems, and efforts by the Borough, with the assistance of other agencies, serve to continue to improve the community. The addition of Hatch Mott MacDonald as Borough Coastal Engineer in 1991, a private consulting firm having a specialty in coastal and riverine engineering, has helped to further solidify and organize improvement efforts previously spearheaded by the Borough Engineer. With the assistance of Hatch Mott MacDonald and Stetler and Guldin Engineering, Inc., and the Richard Stockton College Coastal Research Center, a digitized aerial mapping system was developed in an AutoCad compatible GIS database containing topography, streets, buildings and other identifiable features. This database was supplemented with NFIP information, inclusive of digitizing corporate limits, flood plains, including floodways and "V" zones, base flood elevations and FIRM zone designations, along with 500 year flood boundaries in compliance with the National Mapping Standards and meeting NFIP/CRS requirements. This mapping has served to increase efficiency and aided in municipal planning efforts for new projects.

Each year Hatch Mott MacDonald, Stetler and Guldin Engineering, Inc. and the Coastal Research Center provides the Borough with assistance in planning and setting goals for the protection of its beaches and infrastructure and provides the engineering necessary to develop such projects. With close adherence to the aforementioned CRS Repetitive Loss Program, Mantoloking compliments its goals for flood prevention and other such projects rounding out each year's agenda with a diverse and aggressive program.

The Borough first became involved in the NFIP, Community Rating System (CRS) Program in 1992. This program provides credit points to the Borough for performing various activities related to flood awareness, flood protection, and flood mitigation. For each 500 credit points awarded, all residents with flood insurance receive a 5% credit off their flood insurance premiums.

The Borough continues to participate in the program to this day, having been credited with over 1,500 points. New activities, including this mitigation plan, have been initiated which could lead to another 1,000 points, meaning all residents with flood insurance would receive a 25% premium reduction.

Activities to date have been primarily related to flood awareness. This includes brochures sent to homeowners addressing all aspects of flood hazards, making data available to homeowners on flood protection, making the services of local and State professionals available to discuss flood protection issues with the residents, and stormwater sewer system maintenance. New activities underway include the development of flood related mapping to be made available to residents; regulations to be adopted to raise required first floor elevations, to prevent construction of critical facilities within the 500 year floodplain, to adopt new building codes which include more flood protection procedures; and more detailed analysis of dune condition and enhancement.

#### **4. STRATEGIC PLANNING - Community Involvement.**

Residents and landowners of Mantoloking are encouraged to be active in the community and to educate themselves by visiting the Borough's library information for coastal and flood hazard protection and to attend such meetings sponsored by the Borough. The Borough also schedules and arranges open meetings presented by the Flooding Committee and Hazard Committee to discuss issues planning strategies and goals that the Borough and residents should achieve. In addition, updates of the Borough's progression on these issues are presented to the residents at the monthly Borough meetings. Newsletters and flood hazard information are regularly mailed to Borough property owners, knowing that public involvement has played a crucial role in laying the foundation for Mantoloking's future. Mantoloking's flood mitigation plan includes continuous upgrades to this information system. A pamphlet containing hazard information has been prepared and is available to the residents.

With each new year, Mantoloking continues to pursue and improve upon methods to educate its residents, protect its coastline, manage its infrastructure and natural features, and efficiently prepare for, and recover from flood damage and natural disasters. In recognizing these obvious threats to the community it is necessary for the Borough to take a preventative approach of annual maintenance projects under a program that would prepare the Borough for a natural disaster, such as a large scale hurricane or extra tropical storm, while at the same time maintaining a staunch commitment to improve the overall quality of life for its residents. The Borough's professionals provide the Borough with assistance in planning and setting goals for the protection of its beaches and infrastructure and provides the engineering necessary to develop such projects by rounding out each year's agenda with a diverse and aggressive program. Such improvement projects and activities include yearly dune restoration/analysis projects, enforcement of Borough Land Use Ordinances and revisions and participation in the Federal Beach Renourishment Project which will encompass the restoration of the Northern Ocean County shoreline from Berkley Township to Point Pleasant Beach. Other activities by the Borough include the periodic reexamination of the Borough's Master Plan that now includes developing a Stormwater Management Plan that reinforces the goals of both the State and the Borough.

Planning for each year's projects and for the long-term goals originates from multiple sources which express the specific needs of residents and landowners who are given the opportunity to communicate their concerns at Municipal Council meetings. Further input is provided from the Borough's council, Public Works Director, Construction Code Official, Engineering Department, and other municipal government officials, with the firm backing of the Borough's Mayor and Administrative branch. Through Mantoloking's local government, comprehensive storm system management and flood mitigation projects have been developed and are actively pursued. Additional valuable assistance in recognizing areas requiring attention are identified utilizing the Borough's Beach and dune monitoring program and engineer's reports to determine such things as frequent flood areas, drainage areas, and protective dune and beach system integrity. On this level of planning, dune maintenance and augmentation in conjunction with infrastructure maintenance plans such as street sweeping, catch basin cleaning programs and backbay flood measures and storm water management plans have been developed and are in effect to maintain the Borough's storm water system to minimize flooding.

Larger annual and long term projects also often originate from public concern but require a thorough feasibility investigation by the Borough Engineering Department. Additional insight is gained on dealing with Mantoloking's coastal and flooding problems through representatives of the Borough faithfully attending state and national emergency management storm mitigation and hurricane conferences. Some of the agencies the Borough has contacted and worked with in the past and plan to work with in the future include: the State of New Jersey and Ocean County, Office of Emergency Management; FEMA; NJDEP; USACE; Richard Stockton College Coastal Research Center; and Stevens Institute of Technology, Davidson Laboratories. Further determinations on projects are made according to the CRS Repetitive Loss Program requirements and available funding.

Mantoloking plans to continue pursuit of an active funding search for mitigation projects and intends to maintain it's successful attainment of Grants for flood mitigation and planning projects as well as flood mapping projects.



Mantoloking hopes for continued success in receiving FEMA grant money for future flood mitigation projects and maintain federal and state recognition for innovation and efficiency in coastal and flood plain management. Mantoloking's year round occupants of over 225 rises as the seasonal population increases over the summer months with an additional 315 seasonal homes being occupied and numerous vacationers visiting its pristine beaches and community.

Summaries of previews public meetings which explain project which were orientated for the preparation of the Borough Mitigation Plan and planned immediate public involvement meetings are determined below.

### **History of Public Information Meetings for Flood Mitigation**

**March 21, 2000 – Council Meeting** - A resolution to memorialize the mayoral appointment of the Flood Strategy Committee was approved.

**September 18, 2000 – Public Council Meeting Presentation** - Councilman Jones explained that Ordinance No. 424 was necessary in order to stay in the insurance program. The current Flood Insurance Rate Map (FIRM) is dated 1984. The new FIRM becomes effective December 20, 2000.

Bob Mainberger from Killam Associates explained the difference between the existing FIRM dated 1984 and the new one. He had maps that indicated the changes in the A and V zones. It was explained that any homeowner with a current flood insurance policy with a low rate would be grandfathered in their current zone. If you were to sell your home, the new owner could maintain that policy.

Thomas Guldin, Borough Engineer, also presented maps, which indicated the scarp line and 60' setback line. This map will be posted in the meeting room for the public to view.

Mr. Mainberger explained that a large vertical cushion of dune is advantageous. The larger the dune, the more the discount and that basement in homes are a detriment. If you were to start construction now, and certify the elevation, the current FIRM would be used. After December 20<sup>th</sup>, the new FIRM would be used.

**December 18, 2000 – Council Meeting** - Councilman Jones reported that the Borough mailed out a facsimile of the new map to all residents which will become effective December 20, 2000. Additional maps can be obtained from FEMA directly.

Councilman Husted stated that Mantoloking has the highest participation, 97%, in the flood insurance program in the country.

**May 21, 2001 – Council Meeting** - Councilman Jones reported that we have done extensive work to raise the discount rate on the flood insurance. Currently we are at level 8 with a 10% discount. However, we would like to achieve level 7 with a 15% discount rate. There is still time to improve the rate.

Councilman Husted encouraged residents to take the maximum flood insurance coverage offered.

**June 18, 2001 – Council Meeting** - Councilman Jones reported that he received a letter from the State in regards to the Flood Insurance discount. We managed to get the level 7 designation which is a 15% discount rate.

**July 16, 2001 – Council Meeting** - Councilman Jones reported that we were unofficially notified that we received level 7 designation that is a 15% discount rate. This will become effective in October.

**September 13, 2001 – Special Public Meeting** - Robert Mainberger of Killam Associates, Inc. and Borough Dune Inspector gave those present a verbal background summary on the U.S. Army Corps of Engineers/New Jersey Dept. of Environmental Protection Draft Feasibility Report and Integrated Environmental Impact Statement. Said report was recently distributed to all municipalities located in the coastline reach between the Manasquan Inlet and the Barnegat Inlet. The report outlined the 2003 proposed project for beach and dune replenishment for this reach.

Some of those whom were present and answered questions and made comments were Bernard Moore of the N.J.D.E.P., Randy Wise of the U.S. Army Corps of Engineers, Pieter Waldenmaier representing the Ocean County Freeholder James Mancini, Kenneth Smith of The Coastal Advocate, Inc., Thomas S. Guldin, P.E., Borough Land Use Officer and Engineer of Stetler and Guldin Engineering and Edwin J. O'Malley, Jr., Esq., Borough Attorney.

**November 19, 2001 – Council Meeting** - Councilman Jones reported that there will be a public meeting on December 4, 2001 between 11:00 am and noon. This will be a question and answer session regarding coastal living, building permit procedures, flood insurance coverage, and evacuation procedures.

**December 4, 2001 – Special Public Meeting** - A public meeting was held as a question and answer session regarding coastal living, building permit procedures, flood insurance coverage, and evacuation procedures.

**March 2002** - A new flood brochure was prepared and mailed out to all residents.

**July 15, 2002 – Council Meeting** - Councilman Jones reported that his committee had met on July 1 to discuss projects to help keep our discount level with flood insurance. Some included painting fish on the storm drains to remind citizens where the water drains; revising the web page with more information. There will be an update at the beach replenishment meeting on July 24<sup>th</sup>.

**July 24, 2002 – Special Public Meeting** - Councilman Jones discussed the flood zone changes and how they relate to flood insurance rates. The Borough is required to enforce certain building regulations as specified in the Flood Damage Prevention Ordinance No. 415. Mantoloking participates in the Community Rating System (CRS) in which the community conducts activities and adopts policies to decrease the risk of flooding and flood damage in the community. This in turn increases the discount for flood insurance for individual homeowners. (Copy of statement attached.)

Jeff Gebert, Acting Chief of Coastal Planning for the U. S. Army Corps of Engineers, explained his history with the Corps and his involvement with this project.

Colleen Rourke, U.S. Army Corps of Engineers project manager, explained the history of the feasibility study, the towns involved in this reach, and the plan formulation stage. Her slide presentation included; slides of storm damage over the years in this area, diagrams of typical dune cross-sections, maps showing the “borrow” areas for sand, access areas for the public, and the project schedule. This includes the design phase to be in Fiscal year 2003 & 2004, and the construction phase to begin in Fiscal year 2005.

John Garofola, Manager, Division of Construction & Engineering, NJDEP, explained the state aid agreement. Each town must have their funds up front. All towns must agree to this project or it does not fly. He is very optimistic that all will come aboard. John Garofola explained that beaches must be town owned and that there must be adequate parking. Mantoloking has public access, however, parking is our weak point, and the town is looking into ways to expand our parking facilities. In Monmouth County they were able to strike a compromise with several towns regarding beach access and parking.

Robert Mainberger, P.E., Borough Dune Inspector, Killam Associates, explained how this project will increase the dune height to 22 ft., dune width to 25 ft. with a fore slope of 5 to 1. The total beach width will be 240 feet. Private property owners will be gaining more beach and adding to their privacy since public access on the dunes is

prohibited. This project also pays for access walkways over dunes. There will be a certain number of handicap accessible walkways in town.

Councilman Husted stated that the Council had already decided to join this project. The meeting tonight was informational only and not to seek approval from the residents. There was a handout available explaining why beach replenishment is necessary. With two miles of beachfront, storm damage could be significant and affect house sales, rentals, tax dollars, etc.

Bob Mainberger stated that he would have the information posted on the Mantoloking website. This will include the e-mail address for the Army Corp of Engineers.

**September 16, 2002 – Council Meeting** - Councilman Jones reported that we have received notice to update our flood insurance information which must be completed by October 1, 2002.

**October 21, 2002 – Council Meeting Presentation** - Dr. Stewart Farrell and Dr. Mark Mihalasky, from the Richard Stockton College Coastal Research Center, made a presentation on the LIDAR System (Light Detection And Ranging) used for delineating and characterizing dune width, elevation, slopes, vegetation density and sand fence lengths. They explained dune structure and vulnerability to storms that could be mapped using this system.

**December 16, 2002** - The flood insurance information pamphlet went out to all residents in mail.

**March 2003** - A new flood brochure was prepared and mailed out to all residents.

**July 16, 2003 – Council Meeting** - Councilman Jones reported that the committee is in the process of revising the risk property list. Several homes previously listed are to be demolished in the near future.

**August 18, 2003 – Council Meeting** - Councilman Jones reported that the committee had a meeting last week. All storm drains to the bay are identified with stenciled blue fish. Also, the committee is looking into the feasibility of raising our discount level from 15% to 20%.

**September 15, 2003 – Council Meeting** - Councilman Jones reported that the committee is continuing work on the submittal due October 1 to the National Flood Insurance Program.

**November 5, 2003** – Formation of NFIP Flood Hazard Mitigation Planning Committee.

**February 17, 2004 – Council Meeting Presentation** - Invited commentators from the Richard Stockton College Coastal Research Center, Dr. Stewart Farrell and Dr. Mark Mihalasky made a presentation. They introduced a new assessment map that illustrated the strengths and weaknesses of our dune system by using Light Detection and Ranging System (LIDAR) and spatial analysis techniques. The data includes 2000 data up to June 2002. They will be working on this map to insure that we have the most recent information for our use in beach and dune issues. Dr. Farrell made further comments on the final report of the beach and dune conditions as of December 31, 2003.

Councilman Jones announced that a survey has been published on the Borough's Website. This survey will be helpful in preparing for risk reduction activities within our community. Copies of the survey are available at Borough Hall, as well.

Councilman Jones said the Flood Mitigation Plan being developed by his committee might help reduce flood insurance rates in the borough.

**March 2004** - A new flood brochure was prepared and mailed out to all residents.

**April 19, 2004 – Council Meeting** - Councilman Jones reported that 35 surveys were completed. Results of the survey were reported.

**April 20, 2004 – Committee Meeting** - The committee reviewed the results of the questionnaire. 35 people responded online and on paper. There was discussion over having a session during the summer to advise residents on how to plan for a disaster.

**October 18, 2004 – Council Meeting** – Council approved the appointment of additional members of NFIP Flood Hazard Mitigation Committee for the Borough of Mantoloking.

**November 15, 2004 – Council Meeting** - Councilman Jones made a general comment on the progress of our codification of ordinances. Mr. O'Malley reported that the project has been undertaken and will be a laborious task. Mr. O'Malley assured the council that he will keep the project moving.

**December 20, 2004 – Council Meeting** - Dr. Stewart Farrell, Dune Consultant for the Borough of Mantoloking, presented a beach-dune assessment map of the Borough ocean coast. He explained that the new mapping will make his job of tracking storm damage to our 145 oceanfront properties easier and more accurate.

**July 19, 2005 – Public Meeting** – Discussion and presentation of Flood Mitigation Plan to General public for comment.

**August 15, 2005 – Council Meeting** - Scheduled Council Meeting to approve Plan and address any concerns of Public. Approved to publish updated Plan onto website for public review.

## **5. PROJECTS AND IMPLEMENTATION**

Current programs and projects that have been authorized and implemented in Mantoloking are as follows:

- Annual dune planting projects
- Annual Beach and Dune Monitoring Contracts
- CRS/NFIP projects
- Installation of Dune Fencing
- Emergency Response Contract
- Elevate Public Walkovers with A.D.A. Access Considerations
- Bulldozing for beach/dune replenishment following severe storm damage
- Studies on dune integrity and storm resistance
- Recodification of Ordinance inclusive of flood hazards.

Future programs planned and present projects to be implemented by Mantoloking include:

- Continuation of monitoring and study by the Richard Stockton College, Coastal Research Center, on beach and dune erosion and beach and dune performance
- Potential State, County and Borough Program of installing backcheck valves on the stormwater outfall system providing drainage to the bay
- Provide residents with local information database on comprehensive flood proofing systems and mitigation techniques.
- Continuation of endorsement of the future NJDEP/USACE Beach and Dune project
- Future participation and funding of the proposed Regional Beach Renourishment Project – USACE/State/County/Mantoloking

- Potential elevation of roads to resist flooding
- Addressable siren system, public address system and emergency broadcast system.
- Acquire flood response vehicle
- Increase identification of emergency evacuation route for the Borough
- Add structural piling requirement to building code
- Flood proof critical emergency service buildings, such as the sanitary sewer pump station, N.J. American Water Well Site, Borough Hall and the Police Building, etc.
- Prepare shoreline for resistance to a minimum 25 year storm event.
- Review of current storm drainage system, review NJDEP Storm Water Management Plan and provide required maintenance/improvements.
- Enforcement of Bulkhead Ordinance (a copy of the proposed ordinance which is under review by the Borough is provided in the Appendix)
- Develop a Repetitive Loss Reduction Plan

## **6. BUILDING CODE – Land Use Ordinance Development**

Since the entire Borough of Mantoloking is in the special flood hazard area all new and substantially improved structures must be built in accordance with the NFIP requirements. However, some structures predate the program and have been built at or below base flood elevations. Mantoloking has set an example for its property owners to follow proposing ordinances to build all improvements to a minimum of 2 feet above suggested NFIP Flood elevations and build all new homes with pile foundations to meet V-zone standards. Development trends in Mantoloking are positive in that Mantoloking's property is valuable, as they are in most resort communities, and therefore older buildings are often demolished to make room for new and improved residences. For all new construction in Mantoloking the Building and Code Enforcement Official requires without exception that lowest floor elevations be above the established base flood elevation per NFIP criteria. The Borough plans to continue this activity and is planning to actively pursue Grants to aid residents in flood resistant upgrades.

In addition to other flood hazard education material the Borough maintains an active and updated web site for reference for all residents and has mailed and plans to continue mailing a general advisory to all property owners to encourage residents to take measures for improvements where possible and in avoiding flood damages. A copy of the Semi-annual Flyer is attached in the Appendix for review.

The Borough has a Master Plan, Zoning Ordinances and Building Codes geared towards floodplain management, and actively amends and adds new ordinances where improvements are possible. (See attached list of ordinances and resolutions containing numerous amendments and resolutions passed in recent years.)

The Borough has approximately 522, residential units, with a growth or increase of approximately 1.3% per year. As previously indicated, all of the Borough's structures fall within the FEMA 100 year flood plain. Also, all of the structures in the Borough are susceptible to the natural hazards identified in Section 2 of this Plan. Typically, as most residents in the Borough have experienced flooding damage of some degree over past years, they tend to undertake incidental repairs as a way of life, and also store valuables above potential minor flood impact levels. The Borough does not track or catalog damages other than those eligible and recorded under NFIP claims.

Although the entire Borough is subject to damages from natural hazards as reflected in the NFIP Repetitive Loss Listing and Map. A map of past repetitive loss structures along with a complete compilation of repetitive loss statements produced by FEMA are available for review at the Engineer's Office. The up-to-date List of Repetitive Loss Properties, as presently recorded, and a copy of the location plan for past repetitive loss properties is shown in the Appendix labeled as such.

The Borough, as one of the future projects that the Borough will implement, will develop and later adopt a repetitive loss reduction plan to facilitate planned improvements to the community and mitigate future flood losses.

## **7. ATLANTIC OCEAN – Dune Ordinance**

The Borough and residents maintain a significant dune system protected under the Borough's adopted dune ordinance, which is consistent with adopted New Jersey Administrative Code (NJAC) and United States Department of Agricultural guidelines.

The Borough has adopted this ordinance to regulate beaches and dunes to assure continued flood mitigation and protection from the forces of the Atlantic Ocean. A copy of Ordinance No. 407 is provided in the Appendix.

## **8. FLOOD HAZARD DATA**

The Borough's FIRM flood community identification number is 340383 0001C.

The corresponding Flood Insurance Rate Map (FIRM) for Mantoloking shows the base flood elevation as high as 13 feet NGVD 29 for the area closest to the Atlantic Ocean and the elevation contiguous to the bay side at 6 feet.

The FIRM designates three types of floodplain: AE Zone, AO Zone, and VE Zone. The majority of Mantoloking is in either an AE or a VE Zone, the base flood will cover the entire Borough including a major portion of the dune areas. The AE Zone is the "regular" floodplain where a base flood elevation is determined, elevation of 6 feet along the bay side of the Borough. The VE Zone is the "coastal high velocity hazard" area where a base flood elevation has been determined, elevation of 15 feet along the Atlantic Ocean and 13 feet contiguous to and West of the Borough's dune system. The AO zone is located centrally within the Borough between the AE and VE zones at a flood depth of one (1) foot above existing grade, and is confided consistent with a "alluvial fan flooding" area.

The coastal high hazard area is subject to the combination of storm surge and wave hazard. This area is where waves during the base flood are at least three feet higher than the stillwater elevation. This is the most dangerous part of the Borough. According to the FIRM, the VE Zone encompasses the Mantoloking Dune System. The beach and dunes act as a primary frontal barrier, by breaking the waves and protecting the areas inland.

A related concern is that it only takes a Category 2 hurricane to produce the base flood. This mitigation Plan therefore recommends activities to protect the Borough and its population from threats.

- A) Implement and actively monitor all emergency broadcast and weather advisories.
- B) Continuous communication with state and county emergency management offices.
- C) Implement emergency advisories to residents with pre-arranged television break-in system and public address system.
- D) Evacuate as deemed necessary utilizing pre-formulated evacuation plan and prearranged shelters per the Ocean County Emergency Operations Plan.

In order to allow Borough residents to better understand the Flood Hazard, the Borough has on file, for review at the Borough Engineer's Office, the following documents which are by inference made part of this plan. These documents are:

- 1) USACE Slosh Flood Model
- 2) FEMA Flood Insurance Rate Map (FIRM) with associated Flood Study and report.
- 3) State of New Jersey Emergency Operation Plan with Hurricane Evacuation Plan.
- 4) Coastal Research Center beach-dune system assessment maps.

## **9. FLOOD PLAIN MANAGEMENT - Strategies**

The Borough has adopted the following strategies and tools from the Unified National Program for Floodplain Management.

Strategy 1: Modify human susceptibility to flood damage and disruption by avoiding hazardous, uneconomic, or unwise use of floodplains. Tools include:

- Floodplain regulations, e.g., zoning to steer development away from hazardous areas or natural areas deserving preservation; subdivision regulations; and building, health and sanitary codes.
- Development and redevelopment policies on the design and location of public services, utilities, and critical facilities; land acquisition; open space preservation; and permanent relocation of buildings.
- Flood proofing of new buildings and retrofitting of existing ones.
- Flood forecasting, warning systems, and emergency plans that prepare people and property for flooding.
- Preservation and restoration of the natural resources and functions of floodplains.

Strategy 2: Modify the impact of flooding by assisting individuals and communities to prepare for, respond to, and recover from floods. Tools include:

- Information and education to assist self-help and protection measures.
- Flood emergency measures to protect people and property during the flood.
- Disaster assistance, flood insurance, and tax adjustments to reduce the financial impact of flooding.
- Post flood recovery plans and programs to help people rebuild and implement mitigation measures to protect against future floods.

Strategy 3: Modify flooding through projects that control flood waters. Tools include:

- Pump stations and drainage systems that convey excess waters away from development.
- Dikes, levees, and floodwalls that keep waters away from developed areas
- Dune construction and alterations that make the dunes more efficient, flooding will be less frequent.
- Back bay bulkhead treatment to hold as much back bay flooding as possible from entering the Borough.
- Installation of back bay check valves to eliminate bay waters from entering drainage pipes.
- Shoreline protection measures that protect inland development and account for the natural

Strategy 4: Preserve and restore the natural resources and functions of floodplains by maintaining and reestablishing floodplain environments in their natural state. Tools Include:

- To these general strategies, the Borough utilizes the following goals and guidelines for selecting the flood protection activities that it would recommend:

- Development planning has been set through the adoption of the Borough's present development regulations and bulk standards. In addition, the Borough has limited development in dune and beach areas, through the adoption of a 60-foot scarp line set back limit under Borough land use ordinance and through a formal adopted zoning map. All development in the Borough is now based on infill development of existing or modified lot boundaries and/or modification of existing residential units under present development regulations and bulk standard ordinances. In accordance with Ocean County Planning Board and Brick Township Municipal Utilities Authority projections, the Borough is essentially grown out with a small potential for dwelling unit increase over the next few years due to the present lot density and existing developable lot area. Accordingly, preservation of present lands is critical to the Borough under the development regulations and adopted bulk standards and land use ordinances.

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## **10. PROPERTY OWNER PROTECTION ASSISTANCE**

There are many ways property owners can protect themselves from flood losses. These include knowing the correct emergency actions to take, purchasing flood insurance, and flood proofing buildings. However, many property owners, even recent flood victims, are not aware of these measures.

The Borough Engineer's Office and Government will continue to collect information and materials on insurance, flood proofing, flood safety, water quality, protection of floodplain flora and fauna, and related topics. Information on available sources of technical and financial assistance will also be collected. Appropriate documents will be provided to the Public Library and are available at the Municipal Building for use by area residents.

The Borough Code Official is familiar with these flood protection measures and available to answer owners' questions on them. A list of names and telephone numbers of resource people who can help with questions beyond his expertise is available in the semi-annual flier which is provided to the residents. These include the N.J. State Building Commission, insurance agents, the Mantoloking Borough Engineer and Coastal Professionals, the United States Environmental Protection Agency (EPA), the NJDEP Department of Flood Plain Management the United States Army Corps of Engineers, and the State Flood Insurance Coordinator.

The Borough Engineer, in coordination with the Mayor's office, offers brochures on flood protection programs and ways that property owners can protect themselves. Forms are also available at Borough Hall in the engineering office. These brochures include information on sources of assistance and are available at the Bay Head Branch of the Ocean County Library System and the Engineer's office. They are available to every resident and business owner in the Borough.

## **11. FLOOD WARNING AND EVACUATION ROUTES**

In accordance with data developed by the Ocean County Department of Planning, 2000 General Demographic Characteristics, the Borough had a permanent population of 446 people at the time of the study. (see General Demographic Characteristic for Mantoloking in Appendix). As the summer months approach, the Borough experiences a population growth of almost eight (8) times the permanent population.

This swing in population creates two (2) distinct problems in flood warning and evacuation. During the winter season, the population is sparse and communication is difficult, as not all residences are occupied. "Word of mouth" communication between those residents who successfully receive the emergency notification to others who per chance did not receive the notification, due to interfering activities or communication handicaps, can breakdown as people are not fully aware of which residences are occupied and which residents are presently in the Borough.

During the summer and the transitional periods before and after the season, the population is variable and can be more extensive, as indicated from the population projections. Communications to these masses can be difficult, as the population is more spread out, typically reaching to the beach and even into the surrounding waters by recreational boaters out for the day. Also, families and friends are split up with various simultaneous activities, inclusive of shopping in adjacent communities, various sports, and recreational activities. Also, once an emergency notification is complete, there is a significant reluctance by vacationers to respond to evacuation advisories, due to their desire to complete their vacation and the capital investment in same.

Once an evacuation or flood emergency advisory is implemented, the time period to complete evacuation is critical

and also compounded by the potential traffic impacts from neighboring communities along proposed evacuation routes. Accordingly, lead time in obtaining the appropriate information to base the emergency warning is critical along with the necessary time element to communicate the problem to the masses.

The basis for development of flood warnings for the Borough at this time is the data provided by the National Weather Service. This data is monitored by the Borough, the County Emergency Management office and the New Jersey Office of Emergency Management, and the appropriate advisories are developed.

The National Weather Service only issues flood warnings for Ocean County. A local flood warning system will be implemented to allow residents and businesses time to move their vehicles and contents to higher ground or higher floors or to effect evacuation if necessary.

The Borough presently also has two (2) fixed sirens to assist in local flood warning notifications, with long-term plans to increase this system. They are located on the roof of the firehouse while the second is mounted on a pole on Newman Place, between Route 35 and East Avenue.

The Borough's Emergency Manager works with the County Emergency Manager and the National Weather Service to implement the local flood warning system for Mantoloking.

The Borough and County Emergency Managers will develop a handout to explain how the system works and what the warning signals are.

While the Mantoloking Bridge is under construction, it has been determined by the County that the evacuation route in case of a notified flood emergency and evacuation advisory be as described in the semi-annual flyer. The evacuation route described in the semi-annual flyer is as follows:

- 1) ALL RESIDENTS – are to proceed North on Route 35 to Manasquan Inlet Bridge and proceed to I-195.
  - o Route 35 will be opened to two lanes Northbound
  - o Barnegat Lane will be made one-way North
  - o Princeton Avenue, Arnold Street and Bay Avenue all will feed North to Route 35 and through Point Pleasant Beach over Manasquan Inlet to I-195

A copy of the current evacuation route is provided in the Appendix.

Upon completion of the bridge, it is anticipated that the bridge will only be utilized by various emergency personal as an access to the coastal region. It may be beneficial to the Borough, in conjunction with the Ocean County Office of Emergency Management and the New Jersey State Police, to implement the following revised evacuation route as the bridge is completed.

- 1) Residents North of Herbert Street (County Route 528) are to proceed North on Route 35 to Manasquan Inlet Bridge and proceed to I-195.
  - o Route 35 will be opened to two lanes Northbound
  - o Barnegat Lane will be made one-way North
- 2) Residents South of Herbert Street (County Route 528) are to proceed North on Route 35
  - o Route 35 will be opened to two lanes Northbound

- o Princeton Avenue, Arnold Street and Bay Avenue all will feed North to Route 35
- o As the residents approach the intersection of Route 35 and Herbert Street (County Route 528) they will be directed to either continue North on Route 35 to Manasquan Inlet Bridge and proceed to I-195 **OR** proceed west on Herbert Street to Mantoloking Road to the Garden State Parkway.

Utilization of “reverse lane strategy” will be implemented for the evacuation routes mentioned above. Route 35 will be utilized as a “reverse lane strategy” or opened to two lanes Northbound. Herbert Street will be orientated to two lanes west for residential evacuation, and one lane east for emergency personal access to the coastal area. Evacuation routes should be pre-determined by the Borough and residents should be notified of the evacuation routes.

## **12. FLOOD PREPAREDNESS PLAN**

The Borough’s emergency preparedness plan does not address any individual hazard in detail. While plans for sheltering evacuees and post-disaster clean-up procedures are adequate, specific actions to take immediately after a flood warning are not included. A detailed flood preparedness plan will be developed that can quickly guide Borough crews to maximize their effectiveness before and during a flood.

The Emergency Manager will work with the county and state emergency management agencies to develop a detailed flood preparedness plan that specifies what actions to take when the ocean or bay reach certain flood levels. The plan should include procedures for monitoring ocean and bay conditions, closing bridges and redirecting traffic, evacuating residents, protecting critical facilities, sandbagging, and providing necessary services.

## **13. CRITICAL FACILITIES**

The flood preparedness plan will include procedures for monitoring the condition of the available evacuation routes and Borough and private facilities inclusive of: the sewage pump station, NJAW Co. well site, public works yard, the Police Station and Borough Hall.

### Critical Facilities Include:

- A) Sewer pump station on Herbert Street.
- B) Police Station on Downer Avenue.
- C) NJAW Co. Pump Station on Bay Avenue.
- D) Fire Station on Downer Avenue.
- E) Public Works Garage on Downer Avenue.
- F) State Home for Wayward Children on State HWY 35.
- G) JCP&L Substation on State HWY 35.

The locations of the above facilities are provided on the location plan entitled “Critical Facility Location Plan” which is provided in the Appendix.

## **14. SUMMARY AND LONG RANGE PLANS:**

- A) Continue with all commitments adopted under the National Flood Insurance program inclusive of all implemented building code regulations for development or redevelopment.

- B) Continue Annual Emergency Storm Response Contract.
- C) Reduce all repetitive flood losses and actively implement the FEMA CRS Program for increased flood damage mitigation and reduced flood insurance premiums.
- D) Develop and implement an engineered flood plain mitigation plan for the Borough's critical areas.
- E) Strive to achieve the following flood resistant features in the Borough:
  - 1) Develop rain water conveyance facilities to meet 25 year storm event loading in non-critical areas.
  - 2) Develop flood resistance and conveyance systems to meet a 25 year storm loading in critical areas by implementation of the attached bulkhead ordinance.
  - 3) Develop Atlantic Ocean protection features to meet a 100 year flood resistance level.
  - 4) Develop back bay bulkhead system to meet a 25 year storm level.
  - 5) Encourage public awareness and education by various means of communication with its residents and property owners, with full public presentations at Borough Council and Planning Board meetings. Continue to educate Mantoloking residents and property owners with Mantoloking's flood mitigation or awareness meetings and update the Borough's Coastal and Flood Hazard Information.

Historically Mantoloking's residents have taken an effective role in the preservation of their community with Mantoloking residents planting thousands of dune grass stolens in the sand to foster dune stabilization each fall and spring.

Mantoloking realizes the first step in reducing property losses is to inform every property owner of the flood hazard area that they lie in. All Mantoloking residents have been informed by a flyer mailed to them to make them aware that the property they own is in a special flood hazard area and that, historically, the Borough floods during storms. The public display has a collection of information for property owners which cover flood preparedness, protecting a building from flooding, flood prevention, flood plain management, retrofitting and natural and beneficial functions of flood plains.

At times when storms threaten, the Borough will ensure that all residents will be notified and directed through the use of the National Weather Service, to allow accurate warning through Emergency Broadcast systems. When such dangers are eminent Mantoloking will implement it's evacuation plan, which was developed in conjunction with the Ocean County and New Jersey State Office of Emergency Management (NJOEM), to ensure residents a safe haven from natural disasters.

- F) Continuation of monitoring and study by Stockton College, Coastal Research Center, on beach and dune erosion and beach and dune performance.

## **15. PROGRAM BENEFITS - Effects to Date**

Since Mantoloking implemented an aggressive approach to protect its community, which commence in 1962,

damage sustained from major storms as recent as the blizzard of 1996 and dating back to the severe storms of 1984, 1985, the 1991 Halloween storm and the Northeast storm of December 1992, has been significantly less than preceding years.

Recent storms starting with the Halloween storm of 1991, through Federal Disaster DR937NJ for the December 1992 storm severely impacted the Borough. The Borough has implemented numerous dune reconstruction projects resulting in a system capable of resisting a twenty five year storm event.

Another significant benefit Mantoloking has yielded is qualifying for significant reductions in flood insurance premiums for its residents and property owners, by addressing NFIP/CRS repetitive loss goals. A summary of the NFIP/CRS points received by the Borough and points that are under review by the NFIP are included in the Appendix of this document.

In a recently completed assessment carried out by the Richard Stockton College Coastal Research Center, Mantoloking has evaluated the resistance of their beach-dune system to coastal storm damage for 2-year, 5-year, 10-year, 20-year, 50-year, and 100-year events. This is the first study of its kind anywhere in the United States. A copy of the Fact Sheet prepared by Dr. Stewart C. Farrel and Dr. Mark J Mihalasky of the Richard Stockton College Coastal Research Center is provided in the Appendix of this document.

Mantoloking's program has consisted of components which have in many cases been utilized by other communities such as beach and dune projects, or its active participation in the NFIP/CRS Program. Mantoloking will continue the Borough's aggressive approach and high standards set forth in its annual and long term goals. Mantoloking will continue to protect its community from potential flood impacts.

In the future Mantoloking plans to continue to improve the quality of life for its residents and to better protect the community from natural disasters by maintaining a cutting edge approach to Beach and Dune preservation technology.

Mantoloking's approach has been and will continue to be a relentless pursuit of excellence towards the safety and protection of its residents and visitors, so that the community can be enjoyed by all.

## **16. FLOOD MITIGATION PLAN - Review Meetings and Adoption Proceedings**

As previously detailed in the body of this plan, the development of the plan has been an ongoing activity throughout Borough's history. Various components of the plan have been developed and adopted as separate entities, while other components of the plan have been adopted or demonstrated through Borough and private actions or by specific Borough projects and private undertakings.

In late 2003, the Borough of Mantoloking determined that there was a need to formally codify the various components of the Borough emergency preparation and flood mitigation activities in a formal plan for adoption by the governing body. Various formal and informal activities and meetings were conducted through 2004 and 2005, with various members of Borough Council, Borough Code Office, Public Works and Emergency Management offices, Borough Administration and Borough Engineer's office, and ongoing meetings regarding related projects with FEMA, NJOEM, USACE, NJDEP, County government and local utility companies.

Following the various meetings the Borough Mayor directed that a Flood Mitigation Planning Committee be organized and to be comprised of the following representatives per the attached appointment resolution:

- A) John Jones, Mantoloking Councilman
- B) Thomas S. Guldin, P.E., Borough Engineer

- C) William Heckman, Borough Superintendent
- D) Richard Laird, Deputy Borough Emergency Management Coordinator
- E) Robert Mainberger, P.E., Borough Dune Inspector
- F) Craig Symons
- G) V. John Wardell, Borough Construction Official
- H) Stanley Witkowski
- I) Peter A. Flihan, Jr.;
- J) John W. Schmierer
- K) Coastal Research Center, Richard Stockton College

The committee is recognized by the Borough's governing board through appointment by the Mayor and inclusion by office in the adopted plan as herein detailed. All formulations of the plan and review of proposed changes are completed under the review and final direction of a N.J. Registered Professional Planner who is also the Borough's Engineer.

Following the initial investigations and informal meetings, formal meetings regarding the plan were scheduled and conducted as follows:

### **History of Committee Meetings for Flood Mitigation**

**November 5, 2003** – Implementation of NFIP Flood Hazard Mitigation Planning Committee

**December 15, 2003** – Organizational meeting – to develop and implement a Hazard Mitigation Plan for the Borough. The work will be coordinated with the Office of Emergency Management. The committee will collaborate with the appropriate County and State departments to ensure consistency. John Jones was elected Chairman, Craig Symons was elected secretary and Bob Mainberger was elected as facilitator.

**January 27, 2004** - Review status of State and County Plans and discuss actions; Review of Planning Team; Preparation of hazard questionnaire tailored for Mantoloking; Draft a work plan and schedule for meeting goals of plan; Discussion of future actions

**February 17, 2004** –Councilman Jones reported that the Borough would be holding its first public meeting this evening. Dr. Farrell will be doing a presentation at the Council Meeting to enlighten the residents of the program.

Several documents were reviewed; FEMA County Local Hazard Mitigation Plan, Hazard/Flood Mitigation Summary and Contacts, Emergency Operations Plan from Ocean County, Ordinance Disposition List.

**April 20, 2004** - Discussion of current Hazard Mitigation Plan and Flood Mitigation Plan efforts and the responsibilities of State/County/Mantoloking; Review results of Questionnaire; review status of Hazard Identification, profiling, asset inventory and loss estimate task; Review Draft a work plan and schedule and revise; Discussion of future actions.

**June 15, 2004** - The Hazard Mitigation Plan has been submitted to Stevens Institute who will develop a draft for us to review; Suggested postponing doing further work on the Flood Mitigation Plan until the Hazard Mitigation Plan is reviewed; Also suggested that information be placed on the website to let residents know what is being done in regards to hazard mitigation; Have information available for them to review; Flood plan to be drafted and forward to the committee; Obtain e-mail addresses of residents.

**September 21, 2004** – Activities were discussed that could be undertaken by the Borough in order to receive additional credits under the CRS program; Discussion that Hazard Mitigation Plan should be comprised of 50% residents. A draft memorandum relating to proposed activities that could be taken by the Borough in order to

It was discovered that the committee did not consist of enough residents in town and a few more should be appointed by the Mayor and Council.

John Jones reviewed for the new members what has been covered in the past meetings.

**April 19, 2005** – Review of Draft Flood Mitigation Plan. Items were discussed to improve report.

**July 19, 2005** – Public Meeting – Discussion and presentation of Flood Mitigation Plan to General public for feed back.

## 17. PLAN REVIEW MEETINGS AND PLAN ADOPTION MEETING DOCUMENTATION

- 20

Ocean County Emergency Management, New Jersey Office of Emergency Management and Federal Emergency Management Agency for review and comment.

- I. November 2005 – Meeting to address revisions/comments of Governmental Offices.
- J. January 2006 – Meeting of Adoption of Final Flood Mitigation Plan with changes.

(Minutes of previous meetings provided in Appendix)

## **18. OUTSIDE AGENCY REVIEW OF MITIGATION PLAN**

Prior to adoption of the plan by the Borough, the Plan should be submitted to Ocean County Office of Emergency Management, New Jersey Office of Emergency Management and Federal Emergency Management Agency for review and comment. Upon return, the Plan should be amended according to their review and adopted at the Borough's next scheduled meeting.

## **19. OVERALL FLOOD PLAIN MANAGEMENT GOALS**

Overall flood plain management goals were discussed in Section No. 14 of this document. Further in-depth review indicates the Borough's overall flood plain management goals are as follows:

1. Develop rainwater conveyance facilities to meet 25 year storm event loading in non-critical areas.
2. Develop flood resistance and conveyance systems to meet a 25 year storm loading in critical areas
3. Develop Atlantic Ocean flood protection features to meet a 100-year coastal storm flood resistance level.
4. Develop back bay bulkhead system to meet a 25 year coastal storm flood level, through adopted Bulkhead Replacement Ordinance.
5. Review application of modular pump station systems to relieve flooding in Mantoloking Bayside areas.
6. Adopt and support USACE/NJDEP Coastal Protection Plan and appropriate moneys as necessary to implement same.
7. Evaluate all dune systems and augment improvement to same.
8. Conform to, and implement CRS program mitigation measures in planned systematic approach.
9. Implementation of back bay backflow check valve program.
10. Evaluate all new and redeveloped residences and install pile foundations in conformance with adopted CRS V-Zone Standards.



## 20. PLAN IMPLEMENTATION AND FUNDING

The present Flood Mitigation Plan, as prepared and adopted, shall be implemented by the Borough of Mantoloking Public works and Emergency Management Office in conjunction with the Building Code Official's office. The plan activities shall be supported out of the annual budgets for each office, in conjunction with Special funds for specific projects as appropriated by the Borough Clerk's office or the Borough Council. Specific large projects will be funded by Borough Ordinance, requiring public advertisement and approval. Where possible, projects will be funded through grants and loans provided by various agencies, such as the NJOEM, NJDEP, FEMA, NJDOT, Federal D.O.T., private grants and agency donations.

Specific approaches, time lines, task leaders and funding mechanisms (existing or proposed) for the goals identified in Section 19 of the Plan are as follows in numerical order, as listed in Section 19:

1. Develop rainwater conveyance facilities to meet 25 year storm event loading in non-critical areas.

Work under this task will be implemented in conjunction with the Borough's roadway reconstruction program. Presently, the Borough has an identified phased roadway program. The first phase of the present program is on file with the Borough Engineer. In addition, as each phase of the program is developed, any specific non-critical rainwater conveyance problems that can be remedied in conjunction with this program, as brought to light by public or private complaint, are included.

### Roadway Program Phase 1

Time Frame ( )

Task Manager Borough Engineer/Borough Code Official

Funding Source Borough Ordinance ( )

Future Phases Potential funding sources: Borough Ordinances, NJDOT Trust Funds, ISTEA and County Grants

2. Develop flood resistance and conveyance systems to meet a 25-year storm loading in critical areas.

Development of 25 year flood resistance and conveyance systems is a two (2) fold problem for the Borough, as follows:

- A) Back bay bulkheads must be elevated to the 25-year storm level to prevent flooding of the Borough from the back bay area (protection of this magnitude already exists on the ocean and inlet frontages).
- B) 25-year storm conveyance systems in critical areas require the implementation of pumping systems to overcome the disabling of gravity systems due to elevated backbay areas.

In order to address these problems, the following projects are in progress:

### A) Back Bay Bulkhead Elevation Project

Elevation of back bay bulkheads cannot be completed immediately, as 95% of these are privately owned and would be a very costly undertaking. Accordingly, the Borough will adopt an Ordinance which requires bulkheads to be raised as they come up for replacement. Since the average life of a bulkhead is 30 years, and through the use of vinyl sheeting, and the fact that some are new, the project may take over 30 years, implemented as follows:

Time frame 30 years± 2005 - 2035

Task manager Borough Engineer's Office

Funding source Private funds for private bulkheads; Borough Ordinance for Borough bulkheads, with potential grants from FEMA Hazard Mitigation Program, NJDOT, NJDEP & Ocean County.

**B) 25 Year Conveyance System Upgrade**

The implementation of this project is slated to be evaluated as part of the NJDOT Route 35 upgrades.

Phase 1: Conveyance system 2006

Time frame: Phase 2 pump stations if feasible- 2008

Task manager: Borough Engineer's office

Funding sources: Borough Ordinance, combined with NJDOT Trust Fund Grant, co-share NJDOT and potential funding from NJDEP and FEMA

3. Develop Atlantic Ocean flood protection features to meet a 100 year coastal storm flood resistance level.

100 year coastal flood resistance is anticipated to be completed with the conclusion of the anticipated USACE/NJDEP/Mantoloking project presently in the design phase, which will enhance the Atlantic oceanfront beach and dune system. Enhancement work, until project is completed, has been conducted as standard operating procedure under the Borough's beach and dune maintenance program.

The USACE/NJDEP/Mantoloking Program is anticipated as follows, pending Congressional authorization of funds:

Time frame: Design: 2005 - 2006

Construction: 2007 - 2008

Task manager: USACE: Keith Watson (at present)

NJDEP: John Garafalo (at present)

Mantoloking: Mayor

Funding source: U.S. Congressional funds, NJDEP Coastal Protection funds, Mantoloking Borough Capital

4. Develop back bay bulkhead system to meet a 25-year coastal storm flood level, through adopted Bulkhead Replacement Ordinance.

See "Goal 2A" previously listed

5. Complete modular pump station system to relieve flooding in Mantoloking Business District.

See "Goal 2B" previously listed

6. Adopt and support USACE/NJDEP Coastal protection Plan and appropriate moneys as necessary to implement same.

In order to assure adoption and the availability of matching funds to put the USACE/NJDEP/Mantoloking Coastal Protection Plan and project in place in accordance with Item #3 above, the Borough is presently working on reliable funding sources to support this program and which will allow the Borough to adopt and execute the required agreements to implement the plan.

Time frame: Construction: 2007 - 2008  
Maintenance: 2008 - 2058  
Task manager: Adoption: Mayor and Council  
Construction: Public Works Emergency Management Officer (E.M.O.)  
Maintenance: E.M.O. & Mayor & Council  
Permanent funding source: Borough Council  
Funding sources: USACE: 65% (at present) Congressional funds  
NJDEP: 26.25% (at present) N.J. Coastal Protection Funds  
Mantoloking: 8.75% (at present) with potential share from County Share/Grant  
Borough revenue sources – beach program savings plan.

7. Evaluate all dune systems and augment improvements to same.

This project goal requires implementation over a longer term period, in conjunction with additional engineering and computer analysis followed by physical augmentation of the dune system in conjunction with the Richard Stockton College Coastal Resource Center. Phase 1 of the project entails the dune computer analysis; Phase 2, dune augmentation in critical areas; Phase 3, mass dune system augmentation where necessary accompanied by planting and fence work. Project development to be implemented as follows:

Phase 1 - Computer Analysis

Time frame 2004 - 2005

Task manager: Mayor

Funding source Borough capital funds

Phase 2 - Dune Augmentation for 25 Year Storm resistance

Time Frame 2006 - 2008

Task manager: Dune Committee

Funding Source Borough ordinance

Phase 3 - Mass Beach and Dune Project

Time frame 2007 - 2008

Task manager(s): Mayor, Dune Committee

Funding source: Borough Ordinance, NJDEP Coastal Grant program; USACE project with Congressional funds

8. Conform to and implement CRS program mitigation measures in planned systematic approach.

Implement CRS program in accordance with yearly identifiable tasks which will allow NFIP premium reductions in the most cost effective manner.

Time frame 2005...

Task manager: Borough Engineer

Funding source: Borough operating budget; FEMA Planning Grants, private grants, FEMA HMGP Programs; NJDEP Maritime Grants; NJDEP Flood Plain Grants; FEMA Flood Mitigation projects.

9. Implementation of back bay backflow check valve program.

This project requires the continued analysis and evaluation of Borough and State outfall systems, formulation of appropriate replacement locations and installation of check valves as required.

Time frame 2005...

Task manager: Borough Engineer

Funding source(s) : Borough Ordinance, NJDOT; FEMA Flood Mitigation Grant Program.

10. Upgrade all new and redeveloping construction in conformance with adopted CRS repetitive loss reduction program.

This program would enforce pile installations and floor flood resistance elevations to mitigate future flood damage, inclusive of rebuilding, elevating, or even demolition and property purchases, if feasible.

Task manager(s): Borough Code Official/E.M.O and Borough Engineer.

Funding source(s): Borough Ordinance; N.J. Blue Acres Program, FEMA Programs; Ocean County Grants.

## **21. PLAN REVIEW AND MODIFICATION PROCESS**

Each year the plan shall be reviewed and modified, as necessary, in accordance with the following process:

1. April – Conduct general review meeting of present plan, progress of plan objectives and effectiveness of plan measures. Compile all suggested changes or additions to the plan and discuss same under strategy review section of the meeting. Following meeting, the Boroughs engineer's office will revise plan.
2. May/June – Conduct plan revision meeting to review changes and new document. Complete schedule for Council adoption of plan revisions.
3. July – Distribute plan revisions to residents from Borough Hall, a minimum of two (2) weeks prior to review meeting to be held by Borough Council.
4. August – Meet to review and incorporate, as needed, resident and Council input into the plan, as discussed at public meeting. Hatch Mott MacDonald to revise plan.
5. September – Public meeting to pass resolution to adopt changes to plan.

At the Mayor's request, the time frame above was scheduled so public meetings are held during the summer months when a larger majority of the public is in town.



# **BOROUGH OF MANTOLOKING**

## **FLOOD MITIGATION PLAN**

### **Appendices**

**BOROUGH OF MANTOLOKING**  
**FLOOD MITIGATION PLAN**

**Draft Ordinance – Bulkheads**

# **BOROUGH OF MANTOLOKING**

## **FLOOD MITIGATION PLAN**

**Flood Protection and Coastal Storm  
Safety for the Borough of Mantoloking,  
Semi Annual Flyer**



**BOROUGH OF MANTOLOKING**  
**FLOOD MITIGATION PLAN**

**Ordinance and Resolution Summary**

# **BOROUGH OF MANTOLOKING**

## **FLOOD MITIGATION PLAN**

### **Repetitive Loss Properties and Location Plan**

**BOROUGH OF MANTOLOKING**

**FLOOD MITIGATION PLAN**

**Ordinance No. 407  
Regulation, Preservation and Protection  
of Beaches and Dunes**

**BOROUGH OF MANTOLOKING**  
**FLOOD MITIGATION PLAN**

**Ocean County 2000**  
**General Demographic; Mantoloking**

# **BOROUGH OF MANTOLOKING**

## **FLOOD MITIGATION PLAN**

### **Traffic Routes for Evacuation**

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## **FLOOD MITIGATION PLAN**

### **Critical Facilities Location Plan**

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**Community Rating System (CRS) Summary**

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**Dune-System Assessment**

As Prepared by  
Coastal Research Center,  
Richard Stockton College of New Jersey



# **BOROUGH OF MANTOLOKING**

## **FLOOD MITIGATION PLAN**

**Flood/Hazard Mitigation Planning  
Committee Minutes as Referenced in  
Section 17 “Plan Review Meetings and Plan  
Adoption Meeting Documentation”**

# **BOROUGH OF MANTOLOKING**

## **FLOOD MITIGATION PLAN**

**Web Site Introduction Notice to  
Residents for July 19, 2005  
Public Comment Meeting  
And Comment Sheet**