Multi-Jurisdictional
All Hazard Mitigation Plan
2016 Update
Sussex County, Delaware

Prepared for:
Sussex County Emergency Operations Center

Prepared by:

The Olson Group, Ltd.

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TABLE OF CONTENTS

Content

SECTION 1: INTRODUCTION

Overview

The purpose of the Sussex County Multi-Jurisdictional All Hazard Mitigation Plan Update (hereinafter referred to as the "Plan") is to continue providing guidance for hazard mitigation in Sussex County. It identifies hazard mitigation goals, objectives and recommended actions and initiatives for County and municipal governments to reduce injury and damage from natural hazards.

This Plan meets the requirements for a local hazard mitigation plan under 44 CFR 201.6, published by the Federal Emergency Management Agency (FEMA) and updated in November 2015.

This Plan update continues to keep Sussex County qualified to obtain all disaster assistance to include all categories of Public Assistance, Individual Assistance and Hazard Mitigation grants available through the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended. Future enhancements of the State All Hazard Mitigation Plan will allow the State to obtain greater funding for hazard mitigation planning and projects (20 percent of Federal Stafford Act disaster expenditures versus 7.5 percent for a standard state plan). It also keeps the state eligible for the annually funded Pre-Disaster Mitigation Program, and the Flood Mitigation Assistance Program.

Without an approved state plan, all eligible local jurisdictions would be ineligible to receive a variety of disaster recovery programs, including the Public Assistance Program to repair or replace damaged public facilities, and the Fire Management Assistance Program to help the State and communities recover the costs of major disasters. However, the State and local communities would remain eligible for certain emergency assistance and Human Services programs available through the Stafford Act.

Organization of the Plan

The Plan is organized to parallel the structure provided in the Final Rule, 44 CFR 201.4. The Plan has seven sections, appendices and the municipal mitigation assessment annexes.

- Section 1: Introduction
- Section 2: Planning Process
- Section 3: Hazard Identification
- Section 4: Risk Assessment
- Section 5: Capabilities Assessment
- Section 6: Mitigation Strategy
- Section 7: Plan Monitoring and Maintenance
- Annex A: Municipal Mitigation Assessments
- Annex B: Acronyms
- Annex C: Planning Process

- Annex D: Adoption Resolutions for Sussex County and the Participating Municipalities
- Annex E: Formal Approval Letters for Sussex County and the participating municipalities.

There are references to the CFR throughout the Plan. Where possible, these provide specific section and subsection notations to aid the review process.

Hazards and Risks

The hazard identification, analysis, and vulnerability assessment, completed as part of the Plan Update, identified twelve (12) natural and three (3) human-caused hazards that have the greatest potential to adversely affect the people, environment, economy and property of Sussex County. Hazards that were considered include: Flood, Tropical Storm Winds, Severe Thunderstorm Wind, Tornado, Drought, Hail, Winter Storms, Earthquakes, Dam/Levee Failure, Terrorism, Energy Pipeline Failure, and Hazardous Material Release. The analysis of NCDC records reviewed date from 1955 to the present (2016). Below are brief sketches of these hazards and the risks they pose to the County.

Flood (Riverine and Coastal) – Sussex County is at risk and vulnerable to flooding, validated by structures in the floodplain, number of flood insurance policies in effect and flood insurance claims paid. Flooding has resulted in six injuries and more than $46.5 million in property damage. Of the 64 events recorded by the National Climatic Data Center, several events were considered notable based on such criteria as magnitude, number of deaths and amount of property damage.

The total potential annualized loss in Sussex County is $129,520,000 with the greatest portion of that exposure being in the Atlantic Coast communities as well as areas adjacent to the Indian River. In a 100-year flood event, as many as 1,561 facilities could sustain slight damage and 72 facilities could sustain moderate damage.

Severe Thunderstorm Wind – All buildings and facilities are exposed to thunderstorms and could potentially be impacted. It is not possible to estimate the number of residential, commercial, and other buildings or facilities that may experience losses.

Tropical Storm Wind – Vulnerability models calculate that the potential annualized loss from tropical storm winds is $1,926,244. That amount is thought to be considerably understated. 396 critical facilities would sustain light wind damage, while 995 would sustain moderate damage from winds.

Drought – Although Sussex County as a whole is vulnerable to drought, it causes little damage to the built-up environment, predominantly affecting crops and farmland. The potential annualized losses from drought are $14,659,834.

Winter Storms – Winter storms could potentially impact the entire County; therefore, estimated annualized losses cannot be broken down into distinct categories (residential, commercial, etc.). Potential annualized losses from winter storms are $340,625.

Tornado – It cannot be predicted where a tornado may touch down. All buildings and facilities are exposed to this hazard and could potentially be impacted. The potential annualized losses from tornadoes are negligible.

Hail - All buildings and facilities are exposed to hail and could potentially be impacted, so estimated annualized losses cannot be broken down into distinct categories (residential, commercial, etc.). The potential annualized losses from hail are negligible.

Earthquake – The coastal plain of the Mid-Atlantic is known to be a seismically quiet zone. The Peak Ground Acceleration for a 100-year event is greater than .0060. Potential annualized losses from an earthquake are $190,778. Of the 1,280 potentially affected critical facilities County-wide, they all would sustain less than 1% damage.

Dam/Levee Failure – The approach for determining vulnerability to dam and/or levee failure consists of a number of factors. Data from the US Army Corp of Engineers (USACE) National Inventory of Dams (NID) and the HAZUS-MH demographic inventory was used, with an assumption that dam breaks most likely will occur at the time of maximum capacity. The estimated exposure of people to dam failure in Sussex County is 5,816.

Terrorism – A vulnerability assessment was conducted for Weapons of Mass Destruction (WMDs) in order to expand the scope of the hazard mitigation planning process to include vulnerability to acts of terrorism. Due to the sensitively of the data and conclusions, more in-depth discussion is available in the complete risk assessment maintained at DEMA.

Hazardous Materials – Assessing vulnerability to a hazardous material (HazMat) release on a countywide scale consisted of the type(s) of hazardous material(s) present, the potential for mass casualties, and potential consequences for the surrounding area. The assessment documented information for 13 identified hazardous material sites from the State's exposure data. High consequence events were then selected (high material toxicity and population density), and ALOHA was used for calculating the impact area.

Energy Pipeline Failure – Energy pipelines cross the State of Delaware. If any of these energy pipelines, oil or gas, were to rupture, such an event could endanger property and lives in the immediate area (within less than half a mile radius).

Goals and Objectives

The Hazard Mitigation Steering Committee supported the update of the goals, objectives, and mitigation actions. The mitigation actions address or solve local mitigation issues and problems. The Sussex County Hazard Mitigation Steering Committee developed the following mission statement for the Sussex County All Hazard Mitigation Plan and the following goals for hazard mitigation.

Mission Statement: Continue to develop and update a comprehensive pre- and post-disaster hazard mitigation program guided by the adoption of stormwater management practices, the implementation of codes and regulations, the protection of critical facilities and infrastructure, the adoption of education and outreach efforts, pre-event planning and preparedness and the identification of projects designed to reduce the vulnerability of individuals, families, households, businesses, infrastructure and critical facilities to the negative effects of natural hazards.

Goal #1 Sussex County and participating municipalities will continue to adopt enhanced stormwater management practices.

Goal #2 Sussex County and participating municipalities will continue to adopt and enforce codes and regulations designed to reduce the impact of natural hazards.

Goal #3 Sussex County and participating municipalities will continue to retrofit and protect critical facilities and infrastructure from natural and human-caused hazards.

Goal #4 Sussex County and participating municipalities will continue to enhance education and outreach strategies to improve the dissemination of information to the public regarding hazards, including the steps that can be taken to reduce their impact.

Goal#5 Sussex County and participating municipalities will continue to improve pre-event planning and preparedness activities.

Goal#6 Sussex County and participating municipalities will continue to identify and implement sound hazard mitigation projects.

Work continues with local agencies and departments to develop projected timelines and potential funding sources for the actions identified in the mitigation strategy. Specific mitigation actions are contained in Section 6 and the Municipal Mitigation Assessment Annexes of the Plan.

Planning Process

This Plan update is the product of the efforts consisting of a cross section of people from the County, municipalities and other interested parties. This effort builds on a number of mitigation planning initiatives dating back to 2004.

Staff from the Sussex County Emergency Operations Center led the development effort of the Sussex County All Hazard Mitigation Plan Update. The Director of the Emergency Operations Center directed the planning effort.

The Sussex County Hazard Mitigation Steering Committee, assembled by the Sussex County Emergency Operations Center and DEMA Natural Hazards Section, provided guidance and assisted with development of the All Hazard Mitigation Plan Update, including review of previous hazard mitigation planning initiatives, development of mitigation strategies, and the strategy implementation plan. The members of the Steering Committee and the Hazard Mitigation Working Group (HMWG) p r o v i d e d expertise and perspective to all aspects of the planning process, including, land-use planning, building codes, transportation, and infrastructure. Representation included members from the local government, law enforcement, fire service, Licensing & Inspections, emergency management community, state agencies, Public Works, emergency medical professionals, building officials, and private industry.

Introduction

Once the Plan update is promulgated by the Sussex County Council, and approved by FEMA, the Committee will function as an advisor to the State Hazard Mitigation Officer on hazard mitigation efforts, including future reviews and revisions.

Participation by local agencies was critical in the development of the Plan. Twenty-four stakeholders (listed below) participated by identifying potential vulnerable facilities along with agency-specific goals to address their vulnerabilities through mitigation actions and initiatives.

Adoption and Approval

Requirement for Adoption and Approval

Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation the plan has been formally adopted by the governing body of the jurisdiction requesting approval (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan **must** document that it has been formally adopted.

Requirement §201.6(a)(3): Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process. Statewide plans will not be accepted as multi-jurisdictional plans.

Adoption and Approval Procedure

[Note to Reviewers: The highlighted dates in Section 1.6.2 will be filled in after these events take place]

On [Insert DATE], the Federal Emergency Management Agency (FEMA) Region III determined that the Plan was "approvable pending adoption." On [Insert DATE], the Sussex County Hazard Mitigation Working Group met and recommended that Sussex County and the participating municipalities should adopt the Plan. The Plan was submitted to the Sussex County Council as well as the appropriate entity for each participating municipality for review and adoption. The resulting Adoption Resolutions were then submitted to FEMA Region III for approval. FEMA subsequently issued formal approval letters to Delaware Emergency Management Agency (DEMA) for Sussex County and each participating municipality that adopted the Plan. DEMA, in turn issued approval letters to the approved jurisdictions.

Participating Municipalities

Sussex County and the following 24 municipalities and institutions participated in the Plan update by taking an active part in the planning process, identifying mitigation actions, and will adopt the Plan:

- Town of Bethany Beach
- Town of Blades
- Town of Bridgeville
- Town of Delmar
- Town of Fenwick Island
- Town of Frankford
- Town of Georgetown
- Town of Greenwood
- Town of Henlopen Acres
- Town of Laurel
- City of Lewes
- Town of Millsboro

- Town of Millville
- Town of Milton
- Town of Ocean View
- City of Rehoboth Beach
- City of Seaford
- Town of Selbyville
- Town of Slaughter Beach
- Town of South Bethany

To determine if municipal participation in the planning process was adequate for the purposes of this Plan and the FEMA plan review process, the following were established as minimum criteria:

1. Attendance by a representative of each municipality at two (2) meetings where the development of the Plan was discussed;
2. Completion of portions of the capability assessment survey regarding the identify and participation of floodplain administrators, and the current status and update intervals for master plans, zoning plans and capital improvement plans;
3. Identification and documentation of at least two (2) mitigation actions for identified hazards; and
4. Adoption of the Plan after designation of the Plan as "approvable pending adoption" is received from DEMA and FEMA.

Adoption Resolutions

Annex D contains the signed Adoption Resolutions for Sussex County and the participating municipalities.

Approval Letters

Annex E contains the formal Approval Letters for Sussex County and the participating municipalities.

SECTION 2: THE PLANNING PROCESS

Contents of this Section

- Requirement for the Planning Process
- Description of the Planning Process
- Involvement by the Public and Other Interested Parties
- Review and Incorporation of Plans, Studies, Reports, and Other Information

Requirement for the Planning Process

Requirement §201.6(c)(1): *[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

Requirement §201.6(b): *An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:*

1. An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
2. An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
3. Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

The Planning Process

This section describes the planning process undertaken by Sussex County and The Olson Group Planning Team in preparation of the Plan Update.

The Plan update was prepared in accordance with the process established in the State and Local Mitigation Plan Development Guides produced by the Federal Emergency Management Agency (FEMA), and the requirements of 44 CFR 201.6, published by the Federal Emergency Management Agency (FEMA) and updated November 2015. The process includes four basic steps.

- Organize resources,
- Assess risks,
- Develop a mitigation plan, and
- Implement the plan and monitor progress.

Organize Resources

The Sussex County Office of Emergency Management was the lead agency for the development of the Plan update. At the beginning of the process, a consultant firm, The Olson Group Ltd, was hired to provide technical support to the County and all of the member municipalities. In addition, several individuals and organizations worked together to develop the Plan update. These participants were organized into two different committees including:

- Sussex County Hazard Mitigation Steering Committee (HMSC)
- Sussex County Hazard Mitigation Working Group

The Sussex County Hazard Mitigation Steering Committee was comprised principally of the Sussex County Emergency Operations Center Director, Sussex County Department representation, Sussex County's Local Emergency Planning Committee (LEPC) members and Delaware Emergency Management Agency (DEMA) representatives. This committee was formed to provide focus and leadership on behalf of the participating jurisdictions in the development of these Plan updates. The Hazard Mitigation Steering Committee met regularly during the duration of the planning process to receive progress reports from the consultant, review and comment upon draft documents and procedures, and implement relevant tasking and coordinate efforts within the County and participating jurisdictions.

Table 2-1 identifies the primary membership of the Hazard Mitigation Steering Committee.

Table 2-1: Hazard Mitigation Steering Committee

Name & Title	Organization
Joe Thomas, Director	Sussex County Emergency Operations Center
Charles Stevenson, Assistant Director	Sussex County Emergency Operations Center
Jeff Shockley, Sussex County Floodplain Manager	Sussex County Government
Megan Nehrbas, GIS Specialist	Sussex County GIS
Art Paul, State Mitigation Officer (SHMO)	Delaware Emergency Management Agency (DEMA)
Adam Montella, Project Manager	The Olson Group, Ltd. (OGL)
Anthony Mangeri, Planning Lead	The Olson Group, Ltd. (OGL)
Hana Beckerle, Planner	The Olson Group, Ltd. (OGL)
Pete Dennen, Senior Planner	The Olson Group, Ltd. (OGL)

The general workflow for the project consisted of the following steps:

- The Olson Group developed preliminary update versions of documents and plan sections for review by the HMSC. The documents were presented in approximately the same sequence as the information is presented in the Plan.
- HMSC representatives reviewed and directed OGL to make revisions in the documents and plan sections.
- HMSC representatives were also responsible for reviewing work-in-progress with participating municipalities and including any revisions per municipal input in directions to OGL.
- OGL worked directly with municipalities in one-on-one sessions to identify and

document mitigation actions included in Section 6.

- OGL provided a Committee Draft Plan to all participants via the HMSC for review and comment.
- HMSC representatives directed OGL to make any revisions in their respective County plans prior to submittal to DEMA and FEMA for review.

The Sussex County representative on the HMSC was the County EOC Director and provided guidance to the participating Sussex County municipalities via the Sussex County HMWG. The HMWG included all municipal OEM coordinators and related agencies within the County. The OGL planning team members attended the HMWG meetings. The planning team typically presented work-in-progress updates similar to presentations provided to the HMSC.

Guidance provided to the HMWG by the County EOC Director at the meetings and via e-mail correspondence included the following:

- **Critical Infrastructure Inventory –** The Olson Group provided the HMWG with spreadsheets with default data listings per HAZUS-MH. The HMWG members reviewed the information and provided revisions that were then compiled for use in developing mitigation actions. The Olson Group also provided, via the County EOC Director, directions for capturing more detailed information regarding critical infrastructure for use in this Plan update and future planning efforts.
- **Municipal Stakeholder Engagement –** HMSC identified the types of stakeholders to enlist in the planning effort including other municipal departments, schools, hospitals, etc. The HMWG members were then responsible for following up with potential stakeholders. In some cases, stakeholders participated with the local coordinators in the one-on-one meetings used to identify and document mitigation actions.

The HMWG was responsible for representing their community, serving as the point of contact between their community and the HMSC, and completing necessary planning tasks including:

- **Identification of Local Mitigation Actions –** OGL conducted one-on-one municipal working sessions with local coordinators and in some cases, other municipal stakeholders to identify and document specific updates to mitigation actions.
- **Reviewing the Plan Products of the HMSC –** As noted above, presentations were made on a regular basis to the HMSC by the EOC Director and/or OGL to review work-in-progress and secure their agreement with the recommendations made by OGL and the directions provided by the EOC Director. In most cases, agreement was reached without dissent. In a few cases, HMWG members requested additional information. In addition, HMWG members were responsible for reviewing their individual municipality's mitigation actions.

Table 2-2 The information on the following page identifies the membership of the Sussex County HMWG.

Table 2-2: Sussex County Hazard Mitigation Working Group (HMWG) Members

Name, Title	Organization
Joe Thomas, Director	Sussex County Emergency Operations Center
Charles Stevenson	Sussex County OEM
Jeff Shockley	Sussex County CFM
Darin Cathell	Town of Bethany Beach
Vicki Prettyman	Town of Blades
Jesse Savage	Town of Bridgeville
Sara Bynum-King	Town of Delmar
Patricia J. Schuchman	Town of Fenwick Island
Joanne Bacon	Town of Frankford
Gene Dvornick	Town of Georgetown
John F. McDonnell	Town of Greenwood
Thomas Roth	Town of Henlopen Acres
Jamie Smith	Town of Laurel
Paul Eckrich	City of Lewes
Sheldon P. Hudson	Town of Millsboro
Eric Evans	Town of Millville
Kristy Rodgers	Town of Milton
Charles F. McMullen	Town of Ocean View
Keith W. Banks	City of Rehoboth Beach
Charles Anderson	City of Seaford
W. Scott Collins	Town of Selbyville
Robert Wood	Town of Slaughter Beach
Melvin A. Cusick	Town of South Bethany

Table 2-3. Identifies the meetings conducted during the update of the Plan. The meetings focused primarily on the review of work-in-progress for the development of the Plan Update.

Table 2-3: Plan Update Meetings

Date	Meeting	Attendees
November 30, 2015	Project Kick-off Meeting	Sussex EOC, Olson Group
January 8, 2016	Steering Committee Coordination	Sussex EOC, Olson Group
January 20, 2016	HMSC Kick-off Meeting	Sussex EOC, HMSC, Olson Group
January 20, 2016	HMWG Kick-off Meeting	Sussex EOC, HMWG, Olson Group
March 24, 2016	Combined HMSC/HMWG Meeting	Sussex EOC, HMSC, HMWG, Olson Group

Date	Meeting	Attendees
March 24, 2016	Sussex County Planning & Zoning Commission Public Meeting	County Planning & Zoning Commission, Sussex EOC, HMWG, Olson Group
April 5,2016	HAZUS Coordination Meeting	Olson Group, County GIS, University of Delaware
August 8, 2016	County Council Presentation	County Council, Sussex EOC, Olson Group
August 10 /11, 2016	One-on-one municipal working sessions.	HMWG, Olson Group
September 1, 2016	Public Meeting with Mallard Lake Community	Sussex EOC, HMSC, HMWG, Olson Group
September 1, 2016	Steering Committee Coordination and Public Meeting	Sussex EOC, HMSC, Olson Group

Annex C.1 contains documentation for these meetings including agendas, sign-up sheets, presentation materials, and meeting notes where appropriate.

Assess Risks

In accordance with general mitigation planning practice, as well as the established FEMA process, risk assessment forms the basis for this Plan update by quantifying and verifying information about how natural and man-made hazards affect Sussex County and the participating municipalities.

The processes used to complete the hazard identification and risk assessments and the results of these activities are described in Sections 3 and 4 of this Plan update. The assessment determined several aspects of the risks of hazards faced by the County and the participating municipalities:

- Natural hazards that are most likely to affect Sussex County;
- How often hazards are expected to impact Sussex County;

- Expected severity of the hazards;
- Areas of Sussex County that are likely to be affected by hazards;
- How Sussex County's assets, operations, people, and infrastructure may be impacted by

  hazards;
- How private and commercial assets, operations, and infrastructure may be impacted by hazards; and
- Expected future losses if the risk is not mitigated.

The HMSC first identified all hazards with the potential to impact the County during the initial plan development. Next, using a rating system (explained in detail in Section 3), the HMSC reviewed and validated the updated list of hazards. The results of this update process were discussed and validated by the HMWG. These hazards are described in the Hazard Identification portion of the Plan *(Section 3)*.

As a result of in-depth examination of the characteristics of the list of hazards, the HMSC was able to make qualitative determinations that allowed further refinement of the focus of this Plan update to the most predominant risks to the area. The results of this prioritization process were also discussed and validated by the HMWG.

For each of these hazards, the consultants performed detailed risk assessments, i.e. calculations of future expected damages, expressed in dollars where appropriate. The results of the risk assessment were also made available to the public during public presentations. The full process and results of this work is presented in the Risk Assessment portion of this Plan Update *(Section 4)*.

Develop the Mitigation Plan Update

The HMSC developed a series of goals and objectives in response to the results of the original risk assessment. A capability assessment review and update was also conducted to help determine the capacity of the County and the participating municipalities to implement hazard mitigation projects. In addition, the HMSC and the consultant worked with the participating municipalities on an individual basis to identify potential problems and hazard mitigation project solutions to include in the Mitigation Strategy Plan Update. The Mitigation Strategy Plan was discussed and validated by the HMWG. The results of these efforts are detailed in Sections 5 and 6.

Implement the Plan and Monitor Progress

Finally, the HMSC validated a process for on-going monitoring and revisions to the Plan over the next five years. ***Section 7*** details the resulting monitoring, evaluation, and plan update procedures. This step was also reviewed and validated by the HMWG.

Public Involvement and Other Interested Parties

During the development of this Plan Update, public participation was actively solicited.

The HMWG hosted public presentations/meetings, provided drafts of the Plan Update for review, and invited comments on the contents of the Plan. For each meeting, the public and interested parties were notified of the meetings via public notice in area newspapers, notice on the Hazard Mitigation Plan Update website, and emails to interested groups. These public outreach efforts are detailed in ***Table 2-4***. In addition, attendance lists, presentation materials, and meeting notes are compiled in ***Annex C.2***.

Response to this outreach was less than hoped for, as the attendance lists document; however, future outreach by Sussex County and municipal coordinators, including proposed public education and work with stakeholders and other interested parties over the next five years will improve public involvement for the next Plan update.

Table 2-4: Involvement by the Public and Other Interested Parties

Date	Type of Involvement	Meeting Location
January 29,2016	Website with hazard mitigation and plan development information posted	N/A
March 24, 2016	Public meeting with presentation to Sussex County Planning and Zoning Commission	County Administration Offices
August 8, 2016	Public meeting with presentation to Sussex County Council.	County Administration Offices
September 1, 2019	Public meeting with residents of Mallard Lakes.	Mallard Lakes Community Center
September 1, 2019	Steering Committee and HMWG public draft presentation meeting.	County Emergency Operations Center
September 6, 2016	E-mail notice to adjourning counties that the draft plan was available for review and comment on the County website.	N/A
September 5, 2015	Draft Plan posted on County website and hard copy distributed to each municipality for jurisdiction review.	Sussex County Website
September 10, 2016	Draft Plan posted on website for public comment.	Sussex County Website

As part of the development of the Plan update and to the extent possible, Floodplain Administrators were engaged in Plan development and review in many municipalities. In some cases, the Municipal Coordinator who led work on this Plan update was also the Floodplain Administrator for the community. Involvement of Floodplain Administrators' in the process is shown in ***Table 2-5***. Proposed efforts to increase outreach to Floodplain Administrators will result in enhanced participation in the next Plan update.

Table 2-5: Sussex County Floodplain Administrator Involvement

Municipality	Floodplain Administrator Name	Method of Involvement
Town of Bethany Beach	Susan Frederick	Municipal Point of Contact
Town of Blades	Vikki Prettyman	Municipal Point of Contact
Town of Bridgeville	Jerry Butler	Municipal Point of Contact
Town of Delmar	William Hardin	Municipal Point of Contact
Town of Fenwick Island	Patricia J Schuchman	Municipal Point of Contact
Town of Frankford	Cheryn Lynch	Municipal Point of Contact
Town of Georgetown	Jeff Ward	Municipal Point of Contact
Town of Greenwood	John F McDonnell	Municipal Point of Contact
Town of Henlopen Acres	Richard Kollar	Municipal Point of Contact
Town of Laurel	Ken West	Municipal Point of Contact
City of Lewes	Henry Baynum Jr	Municipal Point of Contact
Town of Millsboro	George K Niblett	Municipal Point of Contact
Town of Millville	Don Williams	Municipal Point of Contact
Town of Milton	John Collier	Municipal Point of Contact
Town of Ocean View	Charles F McMullen	Municipal Point of Contact
City of Rehoboth Beach	Damalier Molina	Municipal Point of Contact
City of Seaford	Joshua Littleton	Municipal Point of Contact
Town of Selbyville	Mike Deal	Municipal Point of Contact
Town of Slaughter Beach	Robert Clendaniel	Municipal Point of Contact
Town of South Bethany	Joe Hinks	Municipal Point of Contact

Prior to adoption by the County and the participating municipalities, notice was sent to adjacent jurisdictions and other interested parties that the Draft and Final Plan Updates were available for review. Minutes of meetings (and attendee lists) and copies of relevant correspondence are included in ***Annex C.2 and C.3***.

Review and Incorporation With Other Plans

Federal Government

Selected key Federal sources of information and pre-existing planning work are presented in ***Table 2-6***.

Table 2-6: Federal Documents and Data Utilized

Existing Program, Policy, and Technical Documents	Method of incorporation into the Plan
FEMA Disaster Declarations database and other general hazard data	Used in hazard identification and risk assessment (HIRA) development and history of loss data for multiple hazards
FEMA/National Flood Insurance Program Flood Maps (Flood Insurance Rate Maps, Digital Flood Insurance Rate Maps (DFIRM)	Preliminary DFIRM data were used in developing HIRA, strategies and mitigation actions
FEMA Community Status Book, Community Rating System Eligible Communities	Used in developing capability assessments and mitigation actions
FEMA Tornado Activity in the United States	Used in developing HIRA and history of loss data
FEMA Severe Repetitive Loss data	Used in developing HIRA, strategies, and mitigation actions
FEMA Repetitive Loss data	Used in developing HIRA, strategies, and mitigation actions
National Oceanic and Atmospheric Administration (NOAA)/National Climatic Data Center database	Used in developing history and description of major hazard events for multiple hazards
NOAA Coastal Service Center-Historic Hurricane Tracks Database	Used in developing HIRA, strategies, and mitigation actions
NOAA National Severe Storms Laboratory database	Used in developing HIRA, strategies, and mitigation actions
NOAA Crop Loss database	Used in developing HIRA and history of loss data
The United States Army Corp of Engineers (Risk estimates)	Used in developing HIRA, strategies, and mitigation actions
US Census Bureau data	Used in developing various risk assessments and establishing planning context
US Geological Survey (USGS) National Hazard Seismic Mapping Project	Used in developing HIRA and history of loss data
USGS Large Floods in the United States database	Used in developing HIRA and history of loss data
US Environmental Protection Agency Toxic Release Inventory	Used in developing hazard identification, strategies, and mitigation actions
US Department of Transportation Hazardous Materials Incident Data	Used in developing hazard identification, strategies, and mitigation actions

State of Delaware

Selected state sources of information and pre-existing planning work are presented in this section.

Delaware Hazard Mitigation Plan

Delaware completed the current 2013 State Hazard Mitigation Plan Update to meet the requirements of FR Section 201.4(d), which mandates that States update their mitigation plans every five years, "to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities."

The State Hazard Mitigation Plan Update is a demonstration of Delaware's commitment to reduce risks from natural hazards and serves as a guide for both state and local decision makers as they commit resources to reducing the effects of natural hazards on lives and property. It is designed to outline a strategy to reduce risks from natural hazards in Delaware, and to aid State and local emergency management officials in developing hazard reduction programs.

It is DEMA's intent to use the State Hazard Mitigation Plan Update as a way to provide data to local and regional governments to support their mitigation planning processes, and to provide guidance on best practices.

The statewide mitigation strategies, goals, and objectives, methods of incorporating a varied cross section of relevant disciplines, hazard specific information, and specific data sources are present within the State Hazard Mitigation Plan Update and were utilized in the development of the Sussex County All-Hazards Hazard Mitigation Plan.

Sussex County

Delaware is a *home rule* State, which means that the authority to create laws and control land use resides within the municipal governments, and not with County governmental entities.

Counties throughout Delaware are expected to act in the best interest of, and for the protection of the citizens residing within the confines of their County. State statutes do give limited authorities to the counties, but the more significant authorities rest with the individual municipalities.

Municipalities

Upon initiating the Plan development process, the EOC Director made initial contacts to the HMWG. Concurrent with that effort, all of the local OEM coordinators were made aware of the significance of this plan update effort. A comprehensive "wish list" of documents, data sources, maps, studies, emergency operations plans, land use data, laws, and ordinances was provided to the local OEM coordinators with the request to collect as much of the items as possible in support of the plan update development.

In some cases, information that may exist at the municipal level was not uniformly provided or available. During the next five years, Sussex County Emergency Operations Center (SCEOC) and the municipal coordinators will be taking steps to locate, review and incorporate all the indicated documents in the next Plan update.

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SECTION 3: HAZARD IDENTIFICATION

Contents of this Section

- Requirement for Hazard Identification
- Hazard Identification and History
- Hazard Profiles
- Hazard Prioritization

Requirement for Hazard Identification

44CFR §201.6(c)(2)(i): *[The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*

44CFR §201.6(c)(2)(ii): *[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.*

44CFR §201.6(c)(2)(ii): *[The risk assessment]* ***must*** *also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.*

Hazard Identification and History

Per The Code of Federal Regulations (CFR) requirements, at the outset of the plan update process, the Sussex County Hazard Mitigation Steering Committee and the Sussex County Hazard Mitigation Working Group identified fourteen (14) natural and three (3) technological hazards and their risks as the focus of the Plan update.

These hazards were identified per the experience of the HMSC and the HMWG and in accordance with other references (e.g., County EOP, State EOP, the Delaware State Hazard Mitigation Plan, etc.). The resulting preliminary hazard list is shown in ***Table 3-1***.

Table 3-1: Preliminary Hazard List, Sussex County

Hazard	Type (1)	Hazard Rank	County EOP	Delaware EOP	Delaware HMP (2)	Profiled in HMP?
Flood	N	**1**	ü	ü	ü	
Thunderstorm– (Flooding/Straight-Line Winds)	N	**2**	ü	ü	ü	
Hurricane Wind– (Straight-Line Winds)	N	**2**	ü	ü	ü	

Hazard Identification

Hazard	Type (1)	Hazard Rank	County EOP	Delaware EOP	Delaware HMP (2)	Profiled in HMP?
Extreme Heat/Cold	N	4	ü	ü		
Drought	N	**5**	ü	ü	ü	ü
Winter Storm (Severe Weather)	N	6	ü	ü	ü	
Hazardous Materials Incident	T	**6**	ü	ü		
Tornado– (High Wind)	N	**7**	ü	ü	ü	
Hail	N	**8**	ü		ü	
Tsunami	N	**9**	ü			
Earthquake/Geological	N	UR	ü	ü	ü	ü
Wildfire	N	UR	ü	ü		
Erosion	N	UR	ü	ü		ü
Dam/Levee Failure	T	UR	ü	ü	ü	ü
Terrorism	T	UR	ü	ü		
Pipeline Failure	T	UR	ü	ü		

Notes:

UR Un-Ranked; there was insufficient loss data to generate a ranking but are considered a significant risk to the County and municipalities.

(1) Type Legend: N = Natural; T = Technological/Manmade.

(2) Delaware HMP = State of Delaware Hazard Mitigation Plan, approved by FEMA in January 2014.

The following section profiles the 17 hazards listed above and acted upon during the planning process. The overviews include a description of the hazard, location and extent of the hazard, severity of the hazard, documented impacts on life and property, and past occurrences.

Hazard Profiles

Flood

A flood is an excess of water on land that is normally dry. Floods are usually caused by weather events that deliver more precipitation to a drainage basin then can be easily absorbed or stored within the basin. Flooding is a significant natural hazard throughout the United States. Causes include heavy precipitation, snowmelt, ice jams, dam failures, hurricanes, reservoir overflows, and local thunderstorms. Floodwaters can bring down structures, topple trees, destroy infrastructure, sweep people and vehicles away, and alter landscapes. Floods can occur quickly and without warning, such as flash floods or floods caused by dam breaks, or can build slowly, becoming more significant over time. There may be a lag time between precipitation and the time when the flood peaks, which in some situations may allow for warning and evacuating populations.

Flooding is the most frequent and costly natural hazard within the United States. It is a hazard that has caused more than 10,000 deaths nationwide since 1900. Five years since the 2010 Plan update, there have been 541 flood related deaths nationally, with two deaths within Delaware, and none within Sussex County.

General floods are usually long-term events that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, nor'easters, and other large coastal storms. Urban flooding occurs where man-made development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff.

Flash flooding events usually occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by an ice jam. Most flash flooding is caused by slow moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces. Flash flood waters move at very high speeds where "walls" of water can reach heights of 10 to 20 feet. Flash flood waters and the accompanying debris can uproot trees, roll boulders, destroy buildings, and obliterate bridges and roads.

The periodic flooding of lands adjacent to rivers, streams, and shorelines (land known as the floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood and the 100-year floodplain by the 100-year flood. Flood frequencies such as the 100-year flood are

determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1 percent chance of occurring in any given year.

Historical Occurrence of Flooding Events

According to the National Climatic Data Center, 97 flood events (flood, coastal flood, flash flood) were reported between January 1, 1996 and December 31, 2015. These 97 events resulted in no deaths, six injuries and a combined total of roughly $54,492,000 in property damage.

Flooding

Flooding events that have significantly impacted people, property and the environment:

Countywide, September 16, 1999, 8:30 a.m. ET

Hurricane Floyd battered the State of Delaware with damaging winds and torrential rains that caused widespread flash flooding. Storm totals averaging around nine (9) inches fell within a 12-hour period from early morning through late afternoon. The highest verifiable storm total was 10.58 inches in Greenwood in Sussex County. This established a new 24-hour state record. Approximately 300 people were evacuated to shelters, mainly in Sussex and New Castle counties. The worst damage in Sussex County occurred inland. Serious flooding problems were reported in Bridgeville, Greenwood and Seaford. Seventy-five percent of downtown Greenwood was submerged under four feet of water.

Northeast Sussex County, July 14, 2000, 5 p.m. through July 15, 2000, 3 a.m. ET

Thunderstorms with torrential downpours and frequent lightning caused flash flooding in the northeast part of the county. Doppler Radar storm total estimates indicated an excess of four (4) inches of rainfall from the Ellendale area southeast through Dewey Beach. The heaviest rain fell in the Cedar Creek and Broadkill (north of Milton) Hundreds. A weather station at the Rookery Golf Course measured 12 inches of rain. About a dozen vehicles became stranded in high water. Stranded motorists were sheltered at the Eagle's Nest Church and the Milton Fire Hall. In Rehoboth Beach, 4.5 inches of rain fell in 90 minutes. Five major roadways were flooded. Downtown businesses suffered flood damage as the water and debris were too much for the storm drains. Water levels reached eight inches in some stores.

Countywide, September 2, 2000, 1:30 p.m. to 4:30 p.m. ET

Thunderstorms with torrential rain caused flash flooding, particularly in Broad Creek and Broadkill Hundreds. Doppler Radar storm total estimates reached between four (4) and five (5) inches in that area. The flash flooding spread across roadways and caused several major closures.

Southwest Sussex County, August 11, 2001, 3 p.m. through August 12, 2001, 5 a.m. ET

Slow moving thunderstorms with torrential rains inundated southwestern Sussex County during the late afternoon of the 11th. Doppler Radar storm total estimates reached 8.4 inches

around Seaford. About a dozen municipal streets were closed because of the flooding including Delaware State Route 20. About midnight, the 100-year-old dam on Hearns Pond gave way. The 60-acre pond drained out and a bulkhead along U.S. Route 13A was undercut by the flood waters which then undermined the roadway. The flooding caused extensive damage to the historic Hearns and Rawlings Mills. Fifteen patients of a nearby nursing home were evacuated to the second floor.

Bethany Beach, July 19, 2002, 1:30 p.m. to 4:30 p.m. ET

Very slow moving thunderstorms with very heavy rain inundated the Bethany Beach area of southeastern Sussex County with copious amounts of rain. Doppler Radar storm total estimates reached about 10 inches in Bethany Beach. Two ground truth rainfall reports from Bethany Beach recorded 7.41 inches and six (6) inches. Most of the rain fell between 2 p.m. and 4 p.m. Every road east of Delaware State Route 1 was flooded. All side streets in Bethany Beach were flooded and closed. Up to two feet of water in the downtown area was recorded. The Bethany Fire Department (BFD) rescued occupants of two vehicles that were swept into ditches by flood waters. BFD also rescued an elderly man and woman who drove their vehicle into a pond near the Sea Colony Resort. Even the fire department was not immune: the heavy rain flooded the first floor of the fire station, soaked the furniture and caused the carpeting to float.

Countywide, September 1, 2002, 7 a.m. to 3 p.m. ET

Very heavy rain which persisted over Sussex County from midnight through early afternoon on the 1st caused considerable poor drainage flooding as well as flooding of area streams. There were road closures in about two dozen locations throughout the county including U.S. Routes 9 and 113 and Delaware State Road 20. The Georgetown Plaza Shopping Center flooded and vehicles were stranded in the Wal-Mart parking lot in Seaford. The worst damage from the heavy rain occurred on the 3rd in Millsboro. The middle section of the Christian Storehouse roof collapsed. The building was in the process of having a new roof installed and older sections could not support the weight of the rain and the bundles of new shingles which were left on the roof.

Southwest Sussex County, June 25, 2006, 6:45 a.m. to 5 p.m. ET

Repeating thunderstorms with torrential downpours dropped six to eight inches of rain across southwestern parts of Sussex County during the morning of the 25th. This caused extensive roadway, field and stream flooding. Hardest hit was the Seaford and Blades area where every major roadway was flooded and closed, shopping mall parking lots became lakes. Evacuations of homes and a long term care facility occurred. The torrential rains led to over 300 people being activated, nearly 200 water rescues from stranded vehicles and up to 40 roads were closed. In Seaford over 100 senior citizens were evacuated from Lifecare at Lofland Park Nursing Home because of concerns about the Williams Pond Spillway. The Hearns Pond Dam was also damaged. The Sussex Plaza was flooded including the local Wal-Mart and several car dealerships. Just west of Seaford, the Craig's Pond Dam failed and damaged one road. Chapel Branch flooding reached 10 feet. Three sections of railroad rails and ties hung in suspension by the new gorge created by the flood waters. One sink hole was 30 feet by 30 feet. The dam failure damaged a largemouth bass fishery. In Blades, three mobile

home parks were evacuated: Mobile Garden, Holly View and Hastings Estate.

Southwest Sussex County, April 16, 2007, 08:20 p.m. ET

An intense nor'easter brought heavy rain and flooding to Delaware on the 15th. Heavy rain caused poor drainage and field flooding. The runoff from the heavy rain led to flooding along the Nanticoke River. The Nanticoke River at Bridgeville was above its 8 foot flood stage from 7:30 am on the 16th through 9:20 pm on the 16th. It crested at 8.19 feet at 12:45 pm on the 16th. Precipitation totals included 2.80 inches in Lincoln.

Countywide, March 14, 2010, 10:00 p.m. ET

Four days of rain, heaviest on the 13th, culminated with poor drainage, field and some river flooding across Delaware. Four day storm totals averaged around 2 to 3 inches. Periods of rain started during the morning of the 12th and fell at its heaviest during the first half of the day on the 13th. Periods of lighter rain persisted into the 14th and 15th. The state avoided the heaviest rain that fell within the system in New Jersey.

Countywide, August 30, 2011, 10:07 a.m. ET

Tropical storm force wind gusts overspread Delaware during the afternoon of the 27th and persisted through the afternoon of the 28th. Peak wind gusts averaged around 60 mph. the strongest winds associated with Irene occurred at two distinct times. The first surge occurred during bands of heavier rain during the evening of the 27th. The second peak occurred during the late morning and early afternoon of the 28th. Event precipitation totals avaerged 5 to 12 inches and caused widespread flooding. Event rainfall totals included 9.83 inches in Greenwood, 8.72 inches in Delmar, 7.78 inches in Cokesbury, 7.40 inches in Seaford, 6.00 inches in Lewes, and 5.60 inches at the Georgetown Airport.

Countywide, October 30, 2012, 3:22 p.m. ET

Post Tropical Storm Sandy caused an estimated $5.5 million dollars of damage across the three counties in Delaware. The heavy rain that fell across Sussex County caused poor drainage, creek flooding and tidal flooding along the Delaware Bay. Three roadways were flooded in Selbyville. The culvert over the Bunting Branch was expected to be closed until 2013. Evacuations occurred along the Nanticoke and Broad Creeks. Forty roadways were closed because of either flooding or high winds. The Nanticoke Creek at Bridgeville was above its 8 foot flood stage. Event precipitation totals included 10.20 inches in Georgetown, 9.55 inches in Milford and 9.49 inches in Indian River Acres.

Coastal Flooding

Coastal flooding events that have significantly impacted people, property and the environment:

March 13, 1993, 12 p.m. through March 14, 1993, 3:30 a.m. ET

A major winter storm that developed in the Gulf of Mexico moved northeast across the Mid-Atlantic region on the 13th and 14th producing a variety of weather, including minor costal flooding which occurred at times of high tide Saturday and early Sunday morning. In Rehoboth Beach, waves broke through the dunes in a couple of places and beach erosion

was significant. Dewey Beach had street flooding and beach erosion. Route 1, between Dewey and Bethany Beaches, was closed due to flooding. Sea water, with pizza-sized chunks of ice, flooded roads in Bowers Beach. $50,000 in property damages were reported.

December 20, 1995, 5 a.m. to 9 a.m. ET

A coastal storm brought a prolonged mixture of sleet and snow to interior Sussex County and some minor tidal flooding along the ocean side the county. The onshore flow on the 19th coupled with spring high tides caused minor tidal flooding at the times of high tide the morning of the 20th. Northwest winds the morning of the 20th prevented a further repeat of this flooding.

June 2, 1997, 3 p.m. through June 3, 1997, 8 p.m. ET

A series of low pressure systems moving east off the North Carolina coast and a relatively strong high pressure system over eastern Canada brought a strong and persistent northeast flow from the 2nd through the 4th. The onshore flow peaked during the evening of the 2nd through the morning of the 3rd and produced some minor tidal flooding at times of high tide. A wind gust of 48 MPH was reported by the Cape May-Lewes Ferry the morning of the 3rd. Tidal departures averaged about two feet above normal, peaking the morning of the 3rd. The heavy surf also caused some minor beach erosion, especially in Rehoboth Beach.

November 7, 1997, 11 a.m. through November 8, 1997, 4 p.m. ET

A slow moving nor'easter caused strong winds, heavy rain, beach erosion and widespread, but minor, tidal flooding from midday on the 7th through the morning of the 9th. The several-tide-cycle-pounding caused beach erosion and raised tidal departures to around 3.5 feet above normal and around 2.5 feet above normal at times of high tide from midday on the 7th through the afternoon on the 8th. This caused widespread, but minor, tidal flooding from the midday high tide on the 7th through the afternoon on the 8th. The highest tide reported at Lewes was 7.1 feet above mean low water.

November 14, 1997, 6 a.m. to 11 p.m. ET

A coastal storm developed along the South Carolina coast the morning of the 13th, moving slowly northeast. This nor'easter unfortunately coincided with the full moon and spring tides and caused moderate tidal flooding during the morning high tide and minor tidal flooding during the evening high tide on the 14th as well as beach erosion. The high tides the morning of the 14th were only about two (2) feet above normal. However, the onshore flow coincided with relatively high astronomical tides (even by spring tide standards) and produced moderate tidal flooding. Tides reached 7.5 feet above mean low water at Lewes.

December 29, 1997, 6 p.m. to 11 p.m. ET

A strong onshore flow preceding a low pressure system caused some minor tidal flooding at the times of the evening high tide on the 29th. The heaviest rain in most places did not

coincide with the incoming tide and thus did not exacerbate the flooding along Sussex County's coastal communities. The high tides that evening included 6.1 feet above mean low water in Lewes. Tidal departures averaged between two and 2.5 feet above normal.

January 28, 1998, 6 a.m. through January 29, 1998, 12 p.m. ET

An intense nor'easter pounded Sussex County with tidal flooding, beach erosion, strong winds and heavy rain on the 28th. Conditions were progressively worse closer to the coast. Severe coastal flooding was reported in the county. The high tide the morning of the 28th at Lewes was nine feet (4.3 feet above normal) above mean lower low water. This came within half a foot of the all-time record tide of 9.5 feet above mean lower low water set during the Ash Wednesday Storm of 1962. Wind gusts exceeded hurricane force—in the low 80s around Indian River Inlet and reaching 70 MPH at the Pilot Tower. Service was suspended on the Cape May-Lewes Ferry after wind gusts reached 65 MPH. Eight to 10 foot seas were reported within the breakwater on Delaware Bay. About 10,000 homes and businesses in the state lost power, most of which were in Sussex County. The bay went into the foundation of homes in Broadkill Beach as six foot waves crashed ashore. Flooding was described as "deep" and "unheard of" in Lewes as flooding reached Bay Avenue and Cedar Street. Several streets were barricaded because of the flooding and numerous cars were damaged. Along Coastal Sussex County most of the dune protection was lost from Dewey Beach to Fenwick Island. Waves breached the dunes in several places along the shore, but none were described as major. The boardwalk was damaged at Cape Henlopen State Park. In Henlopen Acres, 50 to 60 trees were uprooted and their limbs punched holes into homes. In Rehoboth Beach, the beach erosion was so severe that it swept away sand from the *west* side of the Boardwalk, exposed the shipwreck of the S.S. Thomas Tracey and the city's first jetty built in the 1920s. In Dewey Beach, the ocean broke through the dunes in two locations. There was also bayside flooding on the western side of the town. About 100 feet of beach was eroded from in front of McKinley Street. It was estimated that only 30 to 40 percent of the dune protection was left. No serious injuries were reported. Damage estimates were around $1.3 million.

February 4, 1998, 1 p.m. through February 9, 1998, 9 a.m. ET

The strongest nor'easter of the winter battered Sussex County with damaging winds, severe coastal flooding, extensive beach erosion, several dune breaches and heavy rain. The county was subsequently declared a disaster area. Damage was estimated at about $1.7 million and was the worst storm to affect the area since January 1992. Hardest hit communities included North Shore and South Bethany on the ocean side, Broadkill Beach on Delaware Bay and Long Neck in the back bay. About 3,000 persons evacuated including most of the permanent residents of Dewey Beach. At Lewes the high tide was 8.6 feet above mean low water, a departure of about 4.5 feet above normal. The extensive flooding and erosion forced the closure of all three state parks along the shore and unearthed relics. About 1,000 acres of farmland were also damaged by salt infiltration. Along the ocean side in Sussex County, North Shores and South Bethany were hit the hardest. Damage in North Shores alone was estimated at $500,000. Ocean front villas were badly damaged losing many decks. The tide ripped through the bottom floor of a

group of homes. Toilets, washers, dryers, heat pumps and propane tanks were strewn in the streets. The sand blanketed streets as far as 300 feet from the ocean. In South Bethany, Ocean Drive was destroyed. Homes on the oceanfront lost steps, windows and decks for a mile long stretch. Debris clogged 1st through 9th Streets. The boardwalk was severely damaged. In Fenwick Island, a dune breach occurred east of "The Curves." Most of the town's dunes were badly damaged. The ocean met Little Assawoman Bay at the north end of town.

May 11, 1998, 6 p.m. through May 12, 1998, 9 p.m. ET

A persistent northeast flow produced minor coastal flooding from the 10th through the 13th. Tidal flooding became locally moderate during the evening high tides on the 11th and 12th, especially in the inlets. The water in the inlets had a hard time draining because of the persistent onshore winds. Tidal departures averaged about 1.5 to 2 feet above normal at times of high tide along the ocean front. At Lewes, the tide was 6.7 feet above mean lower low water that evening. In addition to the tidal flooding, the pounding surf created more erosion problems along the shore.

August 30, 1999, 10 a.m. through August 31, 1999, 2 p.m. ET

The combination of swells from Hurricane Dennis and a stiff northeast flow caused by a strong high pressure system building over the New England States produced rip currents and minor tidal flooding. Rip currents from Dennis started along the Delaware Beaches on Sunday August 29th. About 100 rescues occurred with a few minor injuries. On the 30th, swimming was banned at most of the Delaware Beaches. Minor tidal flooding extended into the back bays and inlets as the northeast winds prevented the tide from receding. On the 30th, the waves and tide reached the dune lines and under the boardwalk at Rehoboth Beach. The water also reached the bulkhead at one end of Bethany Beach and caused flooding along Pennsylvania Avenue, a frequently flooded location. The constant pounding and strong winds did cause beach erosion. Ocean Drive in South Bethany was sand covered because of the strong winds. The highest tide at Lewes reached 6.6 feet above mean lower low water around 1 a.m. on the 31st.

September 25, 2000, 5 p.m. through September 26, 2000, 9 p.m. ET

The combination of spring tides near the new moon, a high pressure system over New England and a low pressure system over the Middle Atlantic States produced widespread minor tidal flooding during the times of high tide from the evening of the 25th through the evening of the 26th. The highest tides occurred during the morning of the 26th. The low pressure system traveled from the lower Tennessee Valley the morning of the 25th to just east of Wallops Island, Virginia the morning of the 26th. The onshore flow persisted for several tide cycles. By the evening of the 26th, the low was far enough offshore for winds to start backing to the northwest. The highest tide at Lewes was 7.1 feet above mean lower low water (a departure of 2.3 feet above normal) the morning of the 26th.

September 29, 2001, 4 p.m. through October 1, 2001, 10:00 a.m. ET

The onshore flow around a nor'easter brought minor to locally moderate tidal flooding along

the Delaware Coast from the 29th through October 1st. The worst flooding occurred during the evening of the 30th. Some beach erosion also occurred. The worst flooding problems were reported in Bethany Beach and on Fenwick Island. In Bethany Beach, the Loop Canal overflowed its banks and flooded several blocks of Pennsylvania Avenue on both the 30th and October 1st. High tide at Breakwater Harbor reached 6.73 feet above mean lower low water around 8 p.m. on the 30th.

September 1, 2006, 11 a.m. to 5 p.m. ET

The combination of the remnants of Tropical Storm Ernesto and a large high pressure system over eastern Canada produced heavy rain and flooding, strong and in some cases damaging winds, tidal flooding and beach erosion in Delaware. Sussex County was hit the hardest with both the flooding (tidal and inland) and high winds. Downed trees damaged homes, vehicles and churches. The Delaware Bay Buoy set an all-time record high wave height for September, 22.3 feet. Ten to twelve foot waves were crashing along the shore line and enhanced rip currents and rough surf persisted through the 5th. There were even five foot waves in Rehoboth Bay. Sussex County took the brunt of the wind and water damage from the storm including the ocean and bayshore communities. In Lewes, the dock and exterior landing, stairway and hand rails at the Harbor of Refuge Lighthouse suffered damage. About 75 feet of beach front was lost. In Cape Henlopen State Park, the dune fencing was damaged. In Rehoboth, about 100 feet of beach was lost as waves reached 12 feet. A large tree damaged one home, another fallen tree destroyed a sidewalk. Sections of the dunes were destroyed. In Bethany Beach, nearly all of the beach was swept away. Erosion reached up to the first row of homes. Inland in Sussex County, the combination of run-off and high tides caused flooding along both the Broadkill Creek (downtown Milton) and the Mispillion River in Milford (Park Avenue and South Walnut Street.

October 6, 2006, 6 p.m. through October 7, 2006, 10:00 a.m. ET

A northeaster brought tidal flooding, heavy rain, strong winds and beach erosion to central and southern Delaware. Minor tidal flooding occurred along the ocean side with the high tide on the evening of the 6th and extended into Delaware Bay with the subsequent high tide during the morning and early afternoon on the 7th. Storm totals averaged two to three inches and highest wind gusts averaged around 50 mph. The worst damage occurred because of the tides and beach erosion. The hardest hit locations along the ocean were South Bethany and Bethany Beach. In Bethany Beach, the high tide went under the boardwalk as there was no beach at high tide. Waves actually crashed onto the boardwalk. In South Bethany, steps were damaged at five oceanfront properties and parts of several driveways were washed away. Beach erosion along the Atlantic was described as moderate. In Delaware Bay at Bowers Beach (Kent County), Main Street was flooded by the high tide on the 7th. The backyards of many homes were flooded. Homes were also surrounded by flood waters on Wyatt Street. The highest tides reached 7.4 feet above mean lower low water at Breakwater Harbor (Sussex County). Minor tidal flooding starts at 6.7 feet above mean lower low water.

May 12, 2008, 4:00 a.m. to 7:00 a.m. ET

Tidal flooding of minor to moderate occurred along coastal Delaware. The tidal gage at Reedy Point peaked at 8.3 feet mean lower low water at 6:00 AM EDT on the 12th. Moderate flooding begins at 8.2 feet mean lower low water. In addition, the Delaware City tidal gage peaked at 9.1 feet mean lower low water at 6:00 AM EDT on the 12th. This was reported to be a new record since the gage was installed in 2001. At Slaughter Beach (Sussex County), heavy wind pushed water over the area's sand dunes and onto roadways, which blocked off Route 36 and Slaughter Beach Road. While the town itself suffered only light damage, major roads were not usable again until the afternoon of the 13th. Perhaps the hardest hit by the storm were the residents of Milford Neck at the end of Lighthouse Road at Slaughter Beach. The "That's Right Fresh Seaford" processing facility suffered heavy damage when wind blew water into the steel building at a height of four feet. In addition, the home at the point, many not raised to avoid flood waters, suffered damage. A car was swamped by rising water from Canary Creek on New Road in Lewes (Sussex County) on the 12th. Major erosion along the dune was noted at the north end of the boardwalk in Rehoboth Beach. Although a new dune held in Bethany Beach (Sussex County), large waves created from the nor'easter on the 12th eroded a section, which created a large drop-off. Erosion was also noted at many other beaches, such as Dewey Beach (Sussex County). The nor'easter on May 12th added insult to injury as 2 to 4 inches of rain that fell up until then in parts of Delaware impacted crops. A couple of corn crops that were newly planted were completely flooded, which could mean they may likely not produce. An estimated 1,000 acres of farmland may have been affected by the tidal flooding from this storm.

October 16, 2009, 4:00 a.m. through October 18, 2009, 10:00 a.m. ET

A pair of nor'easters caused minor to moderate tidal flooding along the ocean and Delaware Bay from the evening high tide of the 15th into the morning high tide of the 19th. They also caused minor tidal flooding along the Delaware River from the morning high tide of the 16th through the morning high tide of the 17th. Tidal flooding extended into the inlets. In addition to the tidal flooding, heavy surf contributed to and exacerbated the erosion along the ocean and lower Delaware Bay. A few roadways were flooded and closed. In Sussex County, sections of Delaware State Route 1 were flooded and closed from the 16th through the 18th from Dewey Beach south into Fenwick Island. The Indian River Inlet Bridge was also closed. In Dewey Beach, Crabbers Cove flooded the morning of the 17th. Along the Sussex County beaches, scarping and erosion occurred. Sand fencing and dunes were damaged in Bethany Beach, South Bethany and Dewey Beach. In South Bethany, four dune crossings were closed. Waves at Bethany Beach reached as high as 9 feet.

November 12, 2009, 2:00 p.m. through November 14, 2009, 9:00 a.m. ET

A powerful nor'easter produced wind gusts nearly as high as 60 mph, widespread moderate tidal flooding, heavy rain and severe beach erosion along the Delaware coast from November 12th through the 14th. Preliminary damage was estimated at 45 million dollars. The combination of heavy rain and tides caused about 50 roads in Delaware to be closed, the most notable Delaware State Route 1. Parts of the roadway remain closed through the

15th as three feet of sand accumulated on it. The highest tides occurred with the morning high tide on the 13th. This was the highest tides in Sussex County since the February 5, 1998 nor'easter. Because of the persistent onshore flow, tidal flooding also occurred in Rehoboth and Indian River Bays. Tidal departures reached four and a half feet. Delaware Governor Jack A. Markell declared a state of emergency on the 12th. Voluntary evacuations occurred in Oak Orchard, Riverdale and Mariners Cove. The Community Church in Oak Orchard was used as a shelter by about 100 people. In Rehoboth Beach, half of the dune sand was gone. There was a cut in the dunes north of the Henlopen Hotel. In Dewey Beach, flooding occurred along Rehoboth Bay. In Indian Beach, the dunes broke in several places and waves broke under homes. Beach erosion was described as the heaviest in Indian Beach and within the Delaware Seashore State Park. In Oak Orchard, Indian River Bay flooding was ranked as the third worst since the 1962 Ash Wednesday nor'easter. In Bethany Beach, four dunes disappeared and flooding occurred in the north side of the municipality. Waves were measured at 10 feet along the shore. In South Bethany, no dunes were left along the south side of the town. The highest tide at Lewes reached 7.88 feet above mean lower low water on the morning of the 13th. Moderate tidal flooding ranges from 7.00 to 7.99 feet above mean lower low water. This was the highest tide recorded in Lewes since the February 5, 1998 nor'easter.

October 29, 2011 08:00 a.m. through 12:00 p.m. ET

Strong northeast winds overspread coastal sections of Kent and Sussex Counties on the 29th and persisted into the early evening before the low pressure system moved farther offshore. The onshore winds caused moderate tidal flooding with the morning tide on the 29th. Tidal related roadway flooding occurred on New Road in Lewes, northbound Delaware State Route 1 north of the Indian River Inlet Bridge, on Long Neck Road at the Malones Mobile Home Park and on Oak Orchard Road in Millsboro. Delaware State Route 1 was closed as a precaution. Along the Delaware Bay in Sussex County between Slaughter Beach and Broadkill Beach, roadway flooding occurred on Prime Hook and Fowler Beach Roads. Prime Hook Road remained closed through the 30th. Once the low pressure system passed far enough east of Delaware during the evening of the 29th, both the strong winds and moderate tidal flooding threat passed.

March 6, 2013, 2:00 p.m. through March 7, 2013, 7:00 a.m. ET

An intense nor'easter brought strong to high northeast winds across Delaware on the 6th as well as minor to moderate tidal flooding in central and lower Delaware Bay. The coastal flooding caused a new breach along Delaware State Route 1 and flooded other roadways. The coastal flooding was exacerbated by wave action as waves at Bethany Beach reached 12 feet. Voluntary evacuations were encouraged for flood prone areas in Sussex County. Peak wind gusts reached around 70 mph and downed trees, tree limbs and wires. About 10,000 homes and businesses lost power across the southern half of the state. Minor tidal flooding persisted into the morning of the 10th. This was the greatest and most persistent tidal flooding to affect the Delaware coast since Hurricane Sandy.

December 9, 8:00 a.m. through 12:00 p.m. ET

A strong nor'easter caused strong winds as well as minor to moderate tidal flooding in the Lower Delaware Bay and the Atlantic Coast on the 9th. The nor'easter also caused beach erosion. Peak wind gusts averaged 45 to 50 mph along coastal Delaware and knocked down trees, tree limbs and power lines. Strong winds blew across the northbound lanes of Delaware State Route 1 north of Indian River Inlet Bridge. Beach erosion caused beach losses at Broadkill Beach and a one foot drop to the beach at Dewey Beach. Six to seven foot waves were observed.

October 2, 2015, 9:00 a.m. through October 3, 2015, 3:00 p.m. ET

Strong winds and minor tidal flooding started with the daytime tide cycle on the 1st. The winds and minor to moderate flooding both peaked on the 2nd. Slow improvement in conditions occurred through the 4th and ended by the 5th. The peak tidal flooding coincided with the strongest winds to affect the area as most of the peak wind gusts occurred during the afternoon of the 2nd. Measured wind gusts included 62 mph at Lewes NOS buoy, 48 mph at the Sussex County Airport, 46 mph at Indian River Bay and 45 mph at Rehoboth Beach.

Flash Flooding

Flash flooding events that have significantly impacted people, property and the environment:

Countywide, September 16, 1999, 8:30 a.m. ET

Hurricane Floyd battered the State of Delaware with damaging winds and torrential rains that caused widespread flash flooding. Storm totals averaging around nine (9) inches fell within a 12-hour period from early morning through late afternoon. The highest verifiable storm total was 10.58 inches in Greenwood in Sussex County. This established a new 24-hour state record. Approximately 300 people were evacuated to shelters, mainly in Sussex and New Castle counties. The worst damage in Sussex County occurred inland. Serious flooding problems were reported in Bridgeville, Greenwood and Seaford. Seventy-five percent of downtown Greenwood was submerged under four feet of water.

Northeast Sussex County, July 14, 2000, 5 p.m. through July 15, 2000, 3 a.m. ET

Thunderstorms with torrential downpours and frequent lightning caused flash flooding in the northeast part of the county. Doppler Radar storm total estimates indicated an excess of four (4) inches of rainfall from the Ellendale area southeast through Dewey Beach. The heaviest rain fell in the Cedar Creek and Broadkill (north of Milton) Hundreds. A weather station at the Rookery Golf Course measured 12 inches of rain. About a dozen vehicles became stranded in high water. Stranded motorists were sheltered at the Eagle's Nest Church and the Milton Fire Hall. In Rehoboth Beach, 4.5 inches of rain fell in 90 minutes. Five major roadways were flooded. Downtown businesses suffered flood damage as the water and debris were too much for the storm drains. Water levels reached eight inches in some stores.

Countywide, September 2, 2000, 1:30 p.m. to 4:30 p.m. ET

Thunderstorms with torrential rain caused flash flooding, particularly in Broad Creek and

Broadkill Hundreds. Doppler Radar storm total estimates reached between four (4) and five (5) inches in that area. The flash flooding spread across roadways and caused several major closures.

Southwest Sussex County, August 11, 2001, 3 p.m. through August 12, 2001, 5 a.m. ET

Slow moving thunderstorms with torrential rains inundated southwestern Sussex County during the late afternoon of the 11th. Doppler Radar storm total estimates reached 8.4 inches around Seaford. About a dozen municipal streets were closed because of the flooding including Delaware State Route 20. About midnight, the 100-year-old dam on Hearns Pond gave way. The 60-acre pond drained out and a bulkhead along U.S. Route 13A was undercut by the flood waters which then undermined the roadway. The flooding caused extensive damage to the historic Hearns and Rawlings Mills. Fifteen patients of a nearby nursing home were evacuated to the second floor.

Bethany Beach, July 19, 2002, 1:30 p.m. to 4:30 p.m. ET

Very slow moving thunderstorms with very heavy rain inundated the Bethany Beach area of southeastern Sussex County with copious amounts of rain. Doppler Radar storm total estimates reached about 10 inches in Bethany Beach. Two ground truth rainfall reports from Bethany Beach recorded 7.41 inches and six (6) inches. Most of the rain fell between 2 p.m. and 4 p.m. Every road east of Delaware State Route 1 was flooded. All side streets in Bethany Beach were flooded and closed. Up to two feet of water in the downtown area was recorded. The Bethany Fire Department (BFD) rescued occupants of two vehicles that were swept into ditches by flood waters. BFD also rescued an elderly man and woman who drove their vehicle into a pond near the Sea Colony Resort. Even the fire department was not immune: the heavy rain flooded the first floor of the fire station, soaked the furniture and caused the carpeting to float.

Countywide, September 1, 2002, 7 a.m. to 3 p.m. ET

Very heavy rain which persisted over Sussex County from midnight through early afternoon on the 1st caused considerable poor drainage flooding as well as flooding of area streams. There were road closures in about two dozen locations throughout the county including U.S. Routes 9 and 113 and Delaware State Road 20. The Georgetown Plaza Shopping Center flooded and vehicles were stranded in the Wal-Mart parking lot in Seaford. The worst damage from the heavy rain occurred on the 3rd in Millsboro. The middle section of the Christian Storehouse roof collapsed. The building was in the process of having a new roof installed and older sections could not support the weight of the rain and the bundles of new shingles which were left on the roof.

Southwest Sussex County, June 25, 2006, 6:45 a.m. to 5 p.m. ET

Repeating thunderstorms with torrential downpours dropped six to eight inches of rain across southwestern parts of Sussex County during the morning of the 25th. This caused extensive roadway, field and stream flooding. Hardest hit was the Seaford and Blades area where every major roadway was flooded and closed, shopping mall parking lots became lakes. Evacuations of homes and a long term care facility occurred. The torrential rains

led to over 300 people being activated, nearly 200 water rescues from stranded vehicles and up to 40 roads were closed. In Seaford over 100 senior citizens were evacuated from Lifecare at Lofland Park Nursing Home because of concerns about the Williams Pond Spillway. The Hearns Pond Dam was also damaged. The Sussex Plaza was flooded including the local Wal-Mart and several car dealerships. Just west of Seaford, the Craig's Pond Dam failed and damaged one road. Chapel Branch flooding reached 10 feet. Three sections of railroad rails and ties hung in suspension by the new gorge created by the flood waters. One sink hole was 30 feet by 30 feet. The dam failure damaged a largemouth bass fishery. In Blades, three mobile home parks were evacuated: Mobile Garden, Holly View and Hastings Estate.

Selbyville Sussex County, August 26, 2012, 12:00 p.m. to 11:00 a.m. ET

Thunderstorms with torrential downpours caused flash flooding in eastern Sussex County. The hardest hit area was in and around Long Neck. Many roadways were flooded and closed. One road collapsed in Oak orchard. In Oak Orchard, River road was under water and the bulkhead of one home was damaged at the Riverwinds Development. Holly Lake Road was also closed. Flooding was reported along Beaver Dam Road and Delaware State Route 5. Along the coast, Delaware State Route 1 in Dewey Beach and Delaware State Route 26 leading into Bethany Beach were flooded. Event precipitation totals included 7.21 in Rehoboth Beach, 6.83 inches in Harbeson, 6.39 inches in Bethany Beach and 5,76 inches in Indian River Inlet.

Fenwick Island Sussex County, July 12, 2013, 1:00 p.m. to 4:00 p.m. ET

A low pressure system formed on a frontal boundary producing showers and thunderstorms with heavy downpours and led to flooding and flash flooding throughout Delaware. Sussex County received 4 to 8 inches and these locations had the worst flash flooding. The heavy rain led to flash flooding from Selbyville east in southern Sussex County. A few roads were closed and sections of Lighthouse and Sand Cove Roads collapsed. Event precipitation totals included 5.50 inches in Selbyville.

Oak Orchard Sussex County, June 13, 2014, 8:15 p.m. to 10:30 p.m. ET

Thunderstorms with heavy downpours caused flash flooding in Millsboro and Long Neck around Indian River Bay. The flash flooding was enhanced because the heavy rain and run-off coincided with high tide. Event precipitation totals included 1.90 inches in Millsboro.

Fenwick Island Sussex County, July 20, 2015, 3:30 p.m. to 5 p.m. ET

A stalling frontal boundary triggered widely scattered thunderstorms with very heavy rain throughout Delaware. One thunderstorm stalled over southeast Sussex County and caused flash flooding of smaller creeks and roadways. Storm total estimates approached four inches along Delaware State Route 54 approaching Fenwick Island.

Occurrences and Probability of the Flood Hazard

The National Climate Data Center (NCDC) databases break flooding into three classifications of events, Flooding, Coastal Flooding, and Flash Flooding. ***Table 3-2*** illustrates flooding events. From 1996 to December 2015, there have been 28 reported events. ***Table 3-3*** illustrates

coastal flooding events. From 1996 to December 2015, there have been 65 reported events leading to five injuries and 51.586 million dollars in property damage. ***Table 3-4*** illustrates flash flooding events. From 1996 to December 2015, there have been 44 reported events leading to one injury and 2.900 million dollars of property damage. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

Table 3-2: Sussex County Flood Event History

Location	County/Zone	St.	Date	Time	Type	Dth	Inj	PrD	CrD
Totals:						0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/25/2000	10:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/25/2000	10:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	03/21/2000	21:00	Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	04/18/2000	19:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	04/18/2000	19:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	08/13/2000	18:30	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/25/2000	17:00	Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/25/2000	17:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	03/05/2001	04:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/14/2001	16:00	Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/29/2001	16:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/29/2001	16:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/01/2001	00:00	Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/01/2001	00:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/14/2001	17:00	Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/14/2001	17:00	Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/07/2002	06:00	Flood	0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	10/07/2002	06:00	Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/23/2003	13:27	Flood	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	06/25/2006	17:00	Flood	0	0	0.00K	0.00K
COUNTYWIDE	SUSSEX CO.	DE	09/01/2006	11:00	Flood	0	0	0.00K	0.00K
RELIANCE	SUSSEX CO.	DE	04/15/2007	12:00	Flood	0	0	0.00K	0.00K
MILTON	SUSSEX CO.	DE	10/28/2009	03:00	Flood	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	12/09/2009	16:07	Flood	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	03/13/2010	09:45	Flood	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	03/29/2010	17:15	Flood	0	0	0.00K	0.00K
SLAUGHTER BEACH	SUSSEX CO.	DE	08/28/2011	05:00	Flood	0	0	0.00K	0.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Table 3-3: Sussex County Coastal Flood Event History

Location	County/Zone	St.	Date	Time	Type	Dth	Inj	PrD	CrD
Totals:						0	5	51.586M	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/07/1996	15:00	Coastal Flood	0	0	250.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/07/1996	15:00	Coastal Flood	0	0	1.750M	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	03/19/1996	17:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/08/1996	15:30	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/08/1996	03:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/13/1996	08:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/02/1997	15:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	10/19/1997	08:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	11/07/1997	11:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	11/07/1997	11:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	11/14/1997	06:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	11/14/1997	06:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/29/1997	18:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/28/1998	06:00	Coastal Flood	0	0	500.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/28/1998	06:00	Coastal Flood	0	0	800.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/04/1998	13:00	Coastal Flood	0	5	700.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/04/1998	13:00	Coastal Flood	0	0	1.000M	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/17/1998	22:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/24/1998	03:30	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/21/1998	11:30	Coastal	0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	Type	Dth	Inj	PrD	CrD
					Flood				
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	03/21/1998	11:30	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	05/11/1998	18:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	05/11/1998	18:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	01/03/1999	09:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	03/15/1999	05:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	08/30/1999	10:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/31/2006	08:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/31/2006	08:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/12/2006	06:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/12/2006	06:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/01/2006	13:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/01/2006	13:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/12/2006	13:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/06/2006	18:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/06/2006	18:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	11/22/2006	08:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	11/22/2006	08:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/13/2007	18:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/13/2007	18:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/27/2007	07:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/27/2007	08:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	05/12/2008	03:00	Coastal Flood	0	0	0.00K	0.00K

Hazard Identification

Location	County/Zone	St.	Date	Time	Type	Dth	Inj	PrD	CrD
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	05/12/2008	04:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/22/2009	18:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/22/2009	18:30	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/16/2009	04:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/16/2009	04:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	11/12/2009	14:00	Coastal Flood	0	0	5.000M	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	11/12/2009	14:00	Coastal Flood	0	0	40.000M	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/19/2009	08:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	12/19/2009	08:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/29/2011	08:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/29/2011	08:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/04/2012	18:30	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/04/2012	19:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/28/2012	18:00	Coastal Flood	0	0	500.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/28/2012	18:00	Coastal Flood	0	0	1.000M	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/06/2013	14:00	Coastal Flood	0	0	25.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	03/06/2013	14:00	Coastal Flood	0	0	50.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	03/09/2013	05:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/09/2013	06:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	12/09/2014	08:00	Coastal Flood	0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/09/2014	08:00	Coastal Flood	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/02/2015	09:00	Coastal Flood	0	0	1.00K	0.00K
DELAWARE BEACHES	DELAWARE BEACHES	DE	10/02/2015	09:00	Coastal	0	0	10.00K	0.00K

Location	County/Zone	St.	Date	Time	Type	Dth	Inj	PrD	CrD
(ZONE)	(ZONE)				Flood				
Totals:						0	5	51.586M	0.00

Table 3-4: Sussex County Flash Flood Event History

Location	County/Zone	St.	Date	Time	Type	Dth	Inj	PrD	CrD
Totals:						0	1	2.900M	0.00K
COUNTYWIDE	SUSSEX CO.	DE	09/16/1999	08:30	Flash Flood	0	1	150.00K	0.00K
NORTHEAST PORTION	SUSSEX CO.	DE	07/14/2000	17:00	Flash Flood	0	0	0.00K	0.00K
NORTHEAST PORTION	SUSSEX CO.	DE	08/04/2000	16:00	Flash Flood	0	0	0.00K	0.00K
COUNTYWIDE	SUSSEX CO.	DE	09/02/2000	13:30	Flash Flood	0	0	0.00K	0.00K
ELLENDALE	SUSSEX CO.	DE	06/21/2001	16:00	Flash Flood	0	0	0.00K	0.00K
SOUTHWEST PORTION	SUSSEX CO.	DE	08/05/2001	17:00	Flash Flood	0	0	0.00K	0.00K
SOUTHWEST PORTION	SUSSEX CO.	DE	08/11/2001	15:00	Flash Flood	0	0	1.100M	0.00K
BETHANY BEACH	SUSSEX CO.	DE	07/19/2002	13:30	Flash Flood	0	0	0.00K	0.00K
ELLENDALE	SUSSEX CO.	DE	07/27/2002	17:30	Flash Flood	0	0	0.00K	0.00K
COUNTYWIDE	SUSSEX CO.	DE	09/01/2002	07:00	Flash Flood	0	0	0.00K	0.00K
NORTHEAST PORTION	SUSSEX CO.	DE	06/21/2003	18:30	Flash Flood	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	05/17/2004	14:00	Flash Flood	0	0	0.00K	0.00K
NORTHEAST PORTION	SUSSEX CO.	DE	08/01/2004	11:15	Flash Flood	0	0	0.00K	0.00K
SOUTH PORTION	SUSSEX CO.	DE	08/01/2004	13:10	Flash Flood	0	0	0.00K	0.00K
EAST PORTION	SUSSEX CO.	DE	06/28/2005	14:15	Flash Flood	0	0	0.00K	0.00K
SOUTHWEST PORTION	SUSSEX CO.	DE	07/16/2005	19:00	Flash Flood	0	0	0.00K	0.00K
SOUTHWEST PORTION	SUSSEX CO.	DE	06/25/2006	06:45	Flash Flood	0	0	1.000M	0.00K
SOUTHEAST PORTION	SUSSEX CO.	DE	07/05/2006	20:00	Flash Flood	0	0	0.00K	0.00K
DELMAR	SUSSEX CO.	DE	07/10/2007	15:00	Flash Flood	0	0	0.00K	0.00K
GUMBORO	SUSSEX CO.	DE	07/06/2008	14:00	Flash Flood	0	0	0.00K	0.00K
OCEAN VIEW	SUSSEX CO.	DE	08/15/2008	15:30	Flash Flood	0	0	0.00K	0.00K
BETHANY BEACH	SUSSEX CO.	DE	08/15/2008	15:45	Flash Flood	0	0	0.00K	0.00K
STAYTONVILLE	SUSSEX CO.	DE	08/22/2009	18:35	Flash Flood	0	0	0.00K	0.00K
BETHANY BEACH	SUSSEX CO.	DE	08/17/2010	14:15	Flash Flood	0	0	0.00K	0.00K
BETHANY BEACH	SUSSEX CO.	DE	08/01/2011	15:30	Flash Flood	0	0	0.00K	0.00K
FENWICK IS	SUSSEX CO.	DE	08/27/2011	20:00	Flash Flood	0	0	0.00K	0.00K
BLADES	SUSSEX CO.	DE	09/08/2011	15:30	Flash Flood	0	0	0.00K	0.00K
MIDWAY	SUSSEX CO.	DE	08/25/2012	18:30	Flash Flood	0	0	100.00K	0.00K
NASSAU	SUSSEX CO.	DE	08/26/2012	00:00	Flash Flood	0	0	500.00K	0.00K
SHORTLY	SUSSEX CO.	DE	09/02/2012	15:25	Flash Flood	0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	06/18/2013	16:00	Flash Flood	0	0	0.00K	0.00K
ANGOLA BEACH	SUSSEX CO.	DE	07/12/2013	12:10	Flash Flood	0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	Type	Dth	Inj	PrD	CrD
FRANKFORD	SUSSEX CO.	DE	07/12/2013	13:00	Flash Flood	0	0	0.00K	0.00K
WILLIAMSVILLE	SUSSEX CO.	DE	07/12/2013	13:00	Flash Flood	0	0	50.00K	0.00K
MILLVILLE	SUSSEX CO.	DE	07/12/2013	13:00	Flash Flood	0	0	0.00K	0.00K
DAGSBORO	SUSSEX CO.	DE	07/12/2013	13:30	Flash Flood	0	0	0.00K	0.00K
STOCKLEY	SUSSEX CO.	DE	07/12/2013	14:00	Flash Flood	0	0	0.00K	0.00K
LOWES XRDS	SUSSEX CO.	DE	07/21/2013	16:30	Flash Flood	0	0	0.00K	0.00K
REDDEN	SUSSEX CO.	DE	08/01/2013	15:40	Flash Flood	0	0	0.00K	0.00K
OCEAN VIEW	SUSSEX CO.	DE	08/01/2013	17:15	Flash Flood	0	0	0.00K	0.00K
ANGOLA	SUSSEX CO.	DE	08/09/2013	19:45	Flash Flood	0	0	0.00K	0.00K
OAK ORCHARD	SUSSEX CO.	DE	06/13/2014	20:15	Flash Flood	0	0	0.00K	0.00K
FENWICK IS	SUSSEX CO.	DE	07/20/2015	15:30	Flash Flood	0	0	0.00K	0.00K
MIDWAY	SUSSEX CO.	DE	07/21/2015	14:35	Flash Flood	0	0	0.00K	0.00K
Totals:						0	1	2.900M	0.00K

For the purpose of assessing flood related analysis and vulnerability assessment, flood, coastal flood and flash flood have been considered under a unified title of flood. Due to the continuous and ongoing nature of the flood hazard threat, it was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated Calculated Priority Risk Index (CPRI) for Flood is shown in ***Table 3-5.***

Table 3-5: CPRI for Degree of Risk for Flood in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
4 x .45	+	2 x .30	+	2 x .15	+	2 x .10	=	2.9

Thunderstorm Wind

According to the National Weather Service, more than 100,000 thunderstorms occur each year. Only about 10 percent of these storms are classified as "severe." Although thunderstorms generally affect a small area when they occur, they are very dangerous because of their ability to generate tornadoes, hailstorms, strong winds, flash flooding, and damaging lightning. While thunderstorms can occur in all regions of the United States, they are most common in the central and southern states because atmospheric conditions in those regions are most ideal for generating these powerful storms.

Thunderstorms are caused when air masses of varying temperatures meet. Rapidly rising warm moist air serves as the "engine" for thunderstorms. These storms can occur singularly, in lines, or in clusters. They can move through an area very quickly or linger for several hours.

Lightning is a discharge of electrical energy resulting from the buildup of positive and

negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder. On average, 89 people are killed each year by lightning strikes in the United States.

The National Weather Service collected data for thunder days, number and duration of thunder events, and lightning strike density for the 30-year period from 1948 to 1977. A series of maps were generated showing the annual average thunder event duration, the annual average number of thunder events, and the mean annual density of lightning strikes. ***Figure 3-1*** illustrates thunderstorm hazard severity based on the annual average number of thunder events from 1948 to 1977.

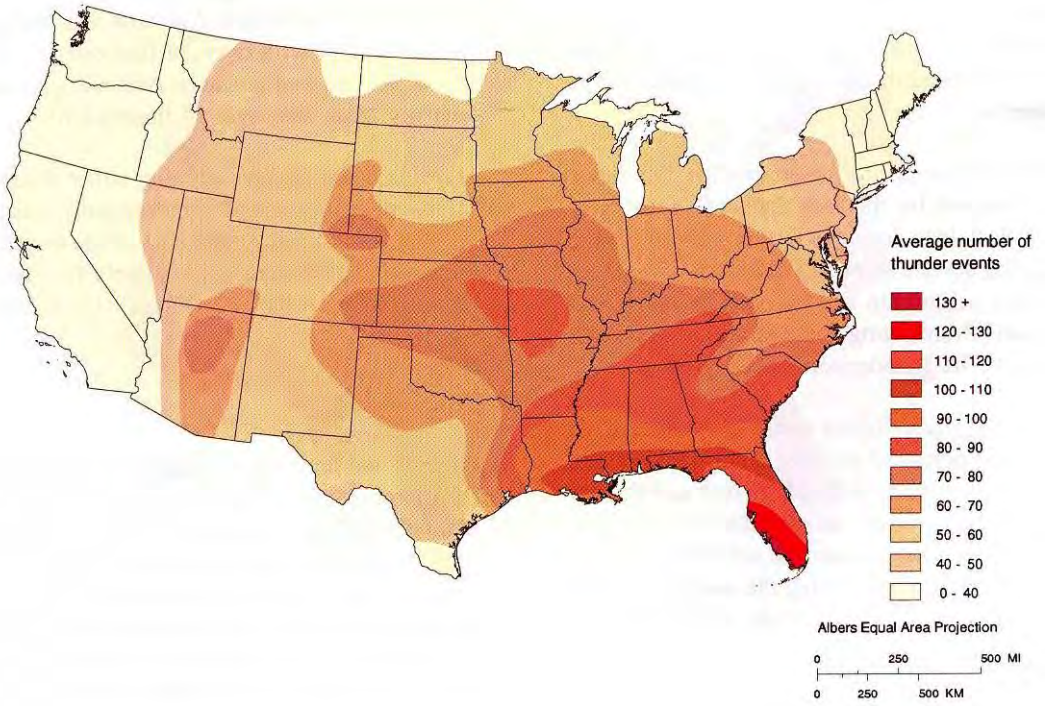


Figure 3-1: Annual Average Number of Thunder Events

Source: Federal Emergency Management Agency

Occurrences and Probability of the Thunderstorm Hazard

According to the National Climatic Data Center (NCDC) databases, since 1957 there have been significant occurrences of both thunderstorm and lightning events. As a consequence of this activity, there have been eleven reported injuries, zero deaths and reported property damages in the amount of $6,005,000 and crop damages in the amount of $101,000, as shown in ***Tables 3-6 and 3-7***. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

Table 3-6: Sussex County Thunderstorm Winds Event History

Hazard Identification

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	7	2.022M	101.00K
SUSSEX CO.	SUSSEX CO.	DE	07/05/1957	16:00	CST	Thunderstorm Wind	70 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/12/1958	20:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/22/1959	14:34	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/27/1965	20:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	02/13/1966	13:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/15/1967	16:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/03/1969	13:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/05/1969	09:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/21/1970	21:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/04/1970	16:05	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/04/1970	17:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/04/1970	17:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/10/1970	12:20	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	01/26/1971	12:55	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	01/26/1971	13:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/02/1971	15:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/26/1971	12:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/12/1974	16:20	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/09/1975	17:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/13/1975	02:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/01/1976	00:40	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
SUSSEX CO.	SUSSEX CO.	DE	08/15/1976	16:18	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	10/09/1976	09:20	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	04/26/1977	11:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	01/21/1979	12:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	03/21/1980	16:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/03/1980	16:05	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/15/1980	16:30	CST	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/03/1980	19:50	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/20/1982	10:35	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/21/1983	16:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/08/1984	16:20	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/31/1985	16:45	CST	Thunderstorm Wind	0 kts.	0	2	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/24/1986	07:30	CST	Thunderstorm Wind	0 kts.	0	1	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/13/1986	21:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/12/1987	11:10	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/21/1987	17:00	CST	Thunderstorm Wind	70 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	03/26/1988	20:30	CST	Thunderstorm Wind	0 kts.	0	2	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/15/1988	18:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	03/31/1989	14:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	03/31/1989	14:50	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	11/16/1989	08:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	11/16/1989	08:00	CST	Thunderstorm	0 kts.	0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
						Wind					
SUSSEX CO.	SUSSEX CO.	DE	02/23/1990	21:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/10/1990	17:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/01/1990	15:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	03/02/1991	06:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	04/24/1991	14:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	04/24/1991	14:40	CST	Thunderstorm Wind	56 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	04/24/1991	15:00	CST	Thunderstorm Wind	65 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/16/1991	14:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/17/1991	14:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/07/1991	11:15	CST	Thunderstorm Wind	100 kts.	0	2	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/01/1992	16:00	PST	Thunderstorm Wind	61 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/10/1992	19:30	PST	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/15/1992	19:30	PST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/15/1992	19:30	PST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/21/1992	13:45	PST	Thunderstorm Wind	65 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/31/1992	17:50	PST	Thunderstorm Wind	60 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/04/1992	15:00	PST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/04/1992	16:00	PST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/04/1992	16:30	PST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	04/01/1993	13:30	EST	Thunderstorm Wind	0 kts.	0	0	5.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	04/01/1993	13:40	EST	Thunderstorm Wind	0 kts.	0	0	5.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Millsboro	SUSSEX CO.	DE	11/28/1993	05:35	EST	Thunderstorm Wind	0 kts.	0	0	0.50K	0.00K
Gumboro	SUSSEX CO.	DE	06/27/1994	13:20	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Seaford	SUSSEX CO.	DE	05/18/1995	15:00	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Dewey Beach	SUSSEX CO.	DE	05/18/1995	15:30	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Fairmount	SUSSEX CO.	DE	07/22/1995	18:30	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Dewey Beach	SUSSEX CO.	DE	11/11/1995	22:30	EST	Thunderstorm Wind	65 kts.	0	0	1.000M	0.00K
GUMBORO	SUSSEX CO.	DE	03/29/1997	15:05	EST	Thunderstorm Wind	61 kts.	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	03/29/1997	15:05	EST	Thunderstorm Wind	61 kts.	0	0	0.00K	0.00K
NASSAU	SUSSEX CO.	DE	05/06/1997	13:30	EST	Thunderstorm Wind		0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	06/18/1997	21:20	EST	Thunderstorm Wind		0	0	0.00K	0.00K
ATLANTA	SUSSEX CO.	DE	06/26/1997	16:30	EST	Thunderstorm Wind		0	0	0.00K	0.00K
FENWICK IS	SUSSEX CO.	DE	07/16/1997	14:32	EST	Thunderstorm Wind		0	0	0.00K	0.00K
RELIANCE	SUSSEX CO.	DE	07/18/1997	20:40	EST	Thunderstorm Wind	78 kts.	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	08/13/1997	15:30	EST	Thunderstorm Wind		0	0	0.00K	0.00K
FENWICK IS	SUSSEX CO.	DE	08/17/1997	18:55	EST	Thunderstorm Wind	74 kts.	0	0	50.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	09/10/1997	16:45	EST	Thunderstorm Wind		0	0	0.00K	0.00K
BETHEL	SUSSEX CO.	DE	06/13/1998	16:50	EST	Thunderstorm Wind	71 kts.	0	0	0.00K	0.00K
GREENWOOD	SUSSEX CO.	DE	06/26/1998	17:36	EST	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
GREENWOOD	SUSSEX CO.	DE	06/26/1998	19:10	EST	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
ELLENDALE	SUSSEX CO.	DE	09/07/1998	15:00	EST	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	02/12/1999	19:10	EST	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	03/06/1999	21:55	EST	Thunderstorm	57 kts.	0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
						Wind					
GUMBORO	SUSSEX CO.	DE	07/24/1999	13:25	EST	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
MILLSBORO	SUSSEX CO.	DE	05/10/2000	18:46	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	05/24/2000	22:02	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	06/02/2000	20:25	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
ELLENDALE	SUSSEX CO.	DE	06/21/2001	15:55	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
LAUREL	SUSSEX CO.	DE	07/05/2001	19:00	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
ROXANA	SUSSEX CO.	DE	08/11/2001	17:00	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	08/13/2001	20:00	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
GREENWOOD	SUSSEX CO.	DE	04/03/2002	15:25	EST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
LINCOLN	SUSSEX CO.	DE	04/03/2002	15:47	EST	Thunderstorm Wind	57 kts. E	0	0	100.00K	0.00K
LEWES	SUSSEX CO.	DE	04/03/2002	16:02	EST	Thunderstorm Wind	61 kts. M	0	0	0.00K	0.00K
SELBYVILLE	SUSSEX CO.	DE	05/13/2002	20:21	EST	Thunderstorm Wind	56 kts. E	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	05/18/2002	07:30	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
GUMBORO	SUSSEX CO.	DE	06/06/2002	16:45	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
MILFORD ARPT	SUSSEX CO.	DE	06/06/2002	16:55	EST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
DELMAR	SUSSEX CO.	DE	07/03/2002	15:45	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
BETHANY BEACH	SUSSEX CO.	DE	07/19/2002	13:22	EST	Thunderstorm Wind	75 kts. M	0	0	0.00K	0.00K
BETHANY BEACH	SUSSEX CO.	DE	07/27/2002	16:40	EST	Thunderstorm Wind		0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	07/06/2003	21:10	EST	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
ROSEDALE BEACH	SUSSEX CO.	DE	07/06/2003	22:44	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
DELMAR	SUSSEX CO.	DE	07/09/2003	19:15	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
CONCORD	SUSSEX CO.	DE	07/09/2003	20:10	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
FAIRMOUNT	SUSSEX CO.	DE	07/09/2003	20:20	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	07/22/2003	16:15	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
GREENWOOD	SUSSEX CO.	DE	08/22/2003	20:38	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BLADES	SUSSEX CO.	DE	08/26/2003	17:10	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	08/30/2003	17:15	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	10/14/2003	22:30	EST	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
MILTON	SUSSEX CO.	DE	11/06/2003	00:08	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	05/17/2004	13:26	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LAUREL	SUSSEX CO.	DE	06/17/2004	18:55	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	08/21/2004	15:25	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MILFORD ARPT	SUSSEX CO.	DE	04/02/2005	20:15	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	06/28/2005	14:00	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
ROSEDALE BEACH	SUSSEX CO.	DE	06/28/2005	14:50	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
ANGOLA BEACH	SUSSEX CO.	DE	06/28/2005	15:36	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LAUREL	SUSSEX CO.	DE	08/07/2005	11:10	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	08/07/2005	11:40	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LAUREL	SUSSEX CO.	DE	09/17/2005	22:00	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MIDWAY	SUSSEX CO.	DE	01/14/2006	05:15	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
DAGSBORO	SUSSEX CO.	DE	06/02/2006	17:15	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	06/02/2006	19:04	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SELBYVILLE	SUSSEX CO.	DE	06/29/2006	15:30	EST	Thunderstorm	50 kts.	0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
						Wind	EG				
GEORGETOWN	SUSSEX CO.	DE	07/02/2006	23:20	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	07/04/2006	18:35	EST	Thunderstorm Wind	52 kts. MG	0	0	0.00K	0.00K
ROSEDALE BEACH	SUSSEX CO.	DE	07/05/2006	17:17	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MILFORD ARPT	SUSSEX CO.	DE	07/28/2006	15:00	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MILLSBORO	SUSSEX CO.	DE	08/24/2006	16:00	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
FENWICK IS	SUSSEX CO.	DE	08/24/2006	16:50	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	09/15/2006	17:30	EST	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
MILFORD ARPT	SUSSEX CO.	DE	05/16/2007	17:40	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LAUREL	SUSSEX CO.	DE	06/27/2007	20:20	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
FRANKFORD	SUSSEX CO.	DE	07/28/2007	14:40	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
OCEAN VIEW	SUSSEX CO.	DE	08/16/2007	21:30	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	08/16/2007	21:50	EST-5	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	08/16/2007	22:04	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	08/16/2007	22:35	EST-5	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
GUMBORO	SUSSEX CO.	DE	03/05/2008	01:57	EST-5	Thunderstorm Wind	55 kts. MG	0	0	5.00K	0.00K
REHOBOTH BEACH	SUSSEX CO.	DE	03/05/2008	02:25	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MILTON	SUSSEX CO.	DE	05/31/2008	14:45	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	06/04/2008	15:42	EST-5	Thunderstorm Wind	61 kts. EG	0	0	250.00K	0.00K
DELMAR	SUSSEX CO.	DE	07/04/2008	20:00	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	09/09/2008	13:30	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
GREENWOOD	SUSSEX CO.	DE	12/12/2008	00:38	EST-5	Thunderstorm Wind	65 kts. EG	0	0	100.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
ROXANA	SUSSEX CO.	DE	06/02/2009	17:40	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
DEWEY BEACH	SUSSEX CO.	DE	06/11/2009	23:05	EST-5	Thunderstorm Wind	53 kts. MG	0	0	0.00K	0.00K
GREENWOOD	SUSSEX CO.	DE	06/13/2009	16:05	EST-5	Thunderstorm Wind	70 kts. EG	0	0	100.00K	100.00K
MILLVILLE	SUSSEX CO.	DE	06/20/2009	17:30	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
DAGSBORO	SUSSEX CO.	DE	06/22/2009	18:00	EST-5	Thunderstorm Wind	52 kts. MG	0	0	0.00K	0.00K
FENWICK IS	SUSSEX CO.	DE	07/28/2009	14:10	EST-5	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
FRANKFORD	SUSSEX CO.	DE	07/31/2009	15:55	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	08/02/2009	12:40	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SLAUGHTER BEACH	SUSSEX CO.	DE	08/09/2009	19:05	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MILLSBORO	SUSSEX CO.	DE	05/14/2010	20:59	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
DUBLIN HILL	SUSSEX CO.	DE	06/22/2010	21:10	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	06/24/2010	17:20	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
FENWICK IS	SUSSEX CO.	DE	06/24/2010	18:35	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
REDDEN	SUSSEX CO.	DE	06/28/2010	15:40	EST-5	Thunderstorm Wind	53 kts. MG	0	0	1.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	07/25/2010	16:10	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	07/25/2010	16:17	EST-5	Thunderstorm Wind	50 kts. MG	0	0	0.00K	0.00K
FRANKFORD	SUSSEX CO.	DE	07/25/2010	16:25	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
BLADES	SUSSEX CO.	DE	08/05/2010	16:50	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
BRIDGEVILLE	SUSSEX CO.	DE	04/05/2011	05:13	EST-5	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
LAUREL	SUSSEX CO.	DE	04/16/2011	19:45	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
ELLENDALE	SUSSEX CO.	DE	05/28/2011	13:45	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	06/10/2011	16:22	EST-	Thunderstorm	52 kts.	0	0	10.00K	1.00K

Hazard Identification

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
					5	Wind	EG				
PILOTTOWN	SUSSEX CO.	DE	07/19/2011	14:25	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
FENWICK IS	SUSSEX CO.	DE	07/19/2011	15:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
OAK ORCHARD	SUSSEX CO.	DE	07/24/2011	13:45	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	07/24/2011	13:57	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
PHILLIPS HILL	SUSSEX CO.	DE	07/24/2011	14:14	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
PILOTTOWN	SUSSEX CO.	DE	08/19/2011	15:43	EST-5	Thunderstorm Wind	50 kts. MG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	08/21/2011	18:25	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
BLADES	SUSSEX CO.	DE	02/24/2012	16:15	EST-5	Thunderstorm Wind	55 kts. EG	0	0	25.00K	0.00K
ROSEDALE BEACH	SUSSEX CO.	DE	06/25/2012	07:50	EST-5	Thunderstorm Wind	56 kts. EG	0	0	100.00K	0.00K
MILLSBORO	SUSSEX CO.	DE	06/25/2012	07:55	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
OAK ORCHARD	SUSSEX CO.	DE	06/25/2012	08:04	EST-5	Thunderstorm Wind	52 kts. EG	0	0	25.00K	0.00K
ANGOLA BEACH	SUSSEX CO.	DE	06/25/2012	08:05	EST-5	Thunderstorm Wind	52 kts. EG	0	0	50.00K	0.00K
ANGOLA BEACH	SUSSEX CO.	DE	06/25/2012	08:06	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
DEWEY BEACH	SUSSEX CO.	DE	06/25/2012	08:13	EST-5	Thunderstorm Wind	60 kts. MG	0	0	50.00K	0.00K
WHITESVILLE	SUSSEX CO.	DE	06/25/2012	09:20	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
PILOTTOWN	SUSSEX CO.	DE	06/25/2012	11:47	EST-5	Thunderstorm Wind	59 kts. MG	0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	06/29/2012	22:57	EST-5	Thunderstorm Wind	61 kts. EG	0	0	100.00K	0.00K
LAUREL	SUSSEX CO.	DE	07/08/2012	19:58	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	08/09/2012	12:55	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
OAK ORCHARD	SUSSEX CO.	DE	08/26/2012	03:40	EST-5	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
FRANKFORD	SUSSEX CO.	DE	06/13/2013	16:02	EST-5	Thunderstorm Wind	59 kts. MG	0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
DEWEY BEACH	SUSSEX CO.	DE	06/13/2013	16:18	EST-5	Thunderstorm Wind	61 kts. MG	0	0	0.00K	0.00K
CHESTNUT KNOLL	SUSSEX CO.	DE	05/22/2014	16:17	EST-5	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	05/22/2014	16:45	EST-5	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
PEPPER	SUSSEX CO.	DE	05/18/2015	13:50	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	06/20/2015	22:20	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
STOCKLEY	SUSSEX CO.	DE	06/20/2015	22:25	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
FRANKFORD	SUSSEX CO.	DE	06/20/2015	23:50	EST-5	Thunderstorm Wind	55 kts. MG	0	0	0.00K	0.00K
WHITESVILLE	SUSSEX CO.	DE	06/23/2015	19:30	EST-5	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
LAUREL	SUSSEX CO.	DE	08/04/2015	22:40	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Totals:								0	7	2.022M	101.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Table 3-7: Sussex County Lightning Event History

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	4	3.983M	0.00K
REHOBOTH BEACH	SUSSEX CO.	DE	08/18/1998	19:00	EST	Lightning		0	0	175.00K	0.00K
OCEAN VIEW	SUSSEX CO.	DE	09/07/1998	18:53	EST	Lightning		0	1	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	04/09/1999	19:00	EST	Lightning		0	0	0.00K	0.00K
REHOBOTH BEACH	SUSSEX CO.	DE	07/10/2000	21:00	EST	Lightning		0	0	0.00K	0.00K
ELLENDALE	SUSSEX CO.	DE	07/14/2000	17:30	EST	Lightning		0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	09/15/2000	01:45	EST	Lightning		0	0	1.00K	0.00K
MILTON	SUSSEX CO.	DE	09/15/2000	02:05	EST	Lightning		0	0	15.00K	0.00K
LAUREL	SUSSEX CO.	DE	07/05/2001	19:00	EST	Lightning		0	1	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	08/10/2001	18:37	EST	Lightning		0	0	200.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	08/11/2001	14:29	EST	Lightning		0	0	150.00K	0.00K
BETHANY BEACH	SUSSEX CO.	DE	08/11/2001	15:00	EST	Lightning		0	0	0.00K	0.00K
SEAFORD	SUSSEX CO.	DE	08/11/2001	16:40	EST	Lightning		0	0	160.00K	0.00K
GUMBORO	SUSSEX CO.	DE	08/11/2001	17:05	EST	Lightning		0	0	0.00K	0.00K
REHOBOTH BEACH	SUSSEX CO.	DE	08/12/2001	21:00	EST	Lightning		0	2	10.00K	0.00K
LINCOLN	SUSSEX CO.	DE	09/04/2001	20:15	EST	Lightning		0	0	5.00K	0.00K
DEWEY BEACH	SUSSEX CO.	DE	04/16/2002	06:45	EST	Lightning		0	0	0.00K	0.00K
SLAUGHTER BEACH	SUSSEX CO.	DE	05/02/2002	08:00	EST	Lightning		0	0	0.00K	0.00K
BETHANY BEACH	SUSSEX CO.	DE	07/19/2002	13:10	EST	Lightning		0	0	250.00K	0.00K
SEAFORD	SUSSEX CO.	DE	08/06/2002	01:30	EST	Lightning		0	0	15.00K	0.00K
LEWES	SUSSEX CO.	DE	07/09/2003	20:30	EST	Lightning		0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	07/21/2003	17:25	EST	Lightning		0	0	25.00K	0.00K
LEWES	SUSSEX CO.	DE	07/22/2003	16:30	EST	Lightning		0	0	25.00K	0.00K
OCEAN VIEW	SUSSEX CO.	DE	08/28/2003	04:46	EST	Lightning		0	0	100.00K	0.00K
DAGSBORO	SUSSEX CO.	DE	08/30/2003	17:40	EST	Lightning		0	0	800.00K	0.00K
FRANKFORD	SUSSEX CO.	DE	05/16/2004	17:00	EST	Lightning		0	0	81.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	05/25/2004	21:00	EST	Lightning		0	0	0.00K	0.00K
LEWES	SUSSEX CO.	DE	05/25/2004	21:30	EST	Lightning		0	0	30.00K	0.00K
MILFORD ARPT	SUSSEX CO.	DE	04/02/2005	20:15	EST	Lightning		0	0	0.00K	0.00K
REHOBOTH BEACH	SUSSEX CO.	DE	06/28/2005	13:30	EST	Lightning		0	0	10.00K	0.00K
MILFORD ARPT	SUSSEX CO.	DE	06/28/2005	14:00	EST	Lightning		0	0	10.00K	0.00K
ROSEDALE BEACH	SUSSEX CO.	DE	06/28/2005	14:30	EST	Lightning		0	0	0.00K	0.00K
LAUREL	SUSSEX CO.	DE	07/26/2005	00:00	EST	Lightning		0	0	75.00K	0.00K
SEAFORD	SUSSEX CO.	DE	07/27/2005	20:00	EST	Lightning		0	0	60.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
BETHANY BEACH	SUSSEX CO.	DE	04/01/2006	14:12	EST	Lightning		0	0	100.00K	0.00K
ANGOLA	SUSSEX CO.	DE	04/14/2006	23:30	EST	Lightning		0	0	2.00K	0.00K
MILLSBORO	SUSSEX CO.	DE	06/29/2006	20:00	EST	Lightning		0	0	1.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	07/10/2007	13:20	EST-5	Lightning		0	0	300.00K	0.00K
LEWES	SUSSEX CO.	DE	07/16/2007	16:30	EST-5	Lightning		0	0	75.00K	0.00K
MILLVILLE	SUSSEX CO.	DE	07/19/2007	16:50	EST-5	Lightning		0	0	25.00K	0.00K
SEAFORD	SUSSEX CO.	DE	07/28/2007	14:30	EST-5	Lightning		0	0	200.00K	0.00K
DEWEY BEACH	SUSSEX CO.	DE	08/16/2007	22:15	EST-5	Lightning		0	0	175.00K	0.00K
GREENWOOD	SUSSEX CO.	DE	09/10/2007	23:45	EST-5	Lightning		0	0	25.00K	0.00K
ELLENDALE	SUSSEX CO.	DE	09/11/2007	00:00	EST-5	Lightning		0	0	5.00K	0.00K
HOLLYVILLE	SUSSEX CO.	DE	04/12/2008	11:40	EST-5	Lightning		0	0	1.50K	0.00K
MILTON	SUSSEX CO.	DE	05/31/2008	15:00	EST-5	Lightning		0	0	10.00K	0.00K
ANGOLA	SUSSEX CO.	DE	07/06/2008	05:25	EST-5	Lightning		0	0	0.50K	0.00K
REHOBOTH BEACH	SUSSEX CO.	DE	07/08/2008	17:30	EST-5	Lightning		0	0	1.00K	0.00K
BAYARD	SUSSEX CO.	DE	04/06/2009	09:55	EST-5	Lightning		0	0	1.00K	0.00K
OCEAN VIEW	SUSSEX CO.	DE	05/29/2009	18:37	EST-5	Lightning		0	0	40.00K	0.00K
REHOBOTH BEACH	SUSSEX CO.	DE	06/09/2009	08:30	EST-5	Lightning		0	0	250.00K	0.00K
CLARKSVILLE	SUSSEX CO.	DE	06/09/2009	08:49	EST-5	Lightning		0	0	1.50K	0.00K
GUMBORO	SUSSEX CO.	DE	05/14/2010	21:15	EST-5	Lightning		0	0	5.00K	0.00K
MILTON	SUSSEX CO.	DE	07/24/2011	13:45	EST-5	Lightning		0	0	1.00K	0.00K
GUMBORO	SUSSEX CO.	DE	07/24/2011	14:15	EST-5	Lightning		0	0	1.00K	0.00K
MILLVILLE	SUSSEX CO.	DE	07/24/2011	14:30	EST-5	Lightning		0	0	1.00K	0.00K
LEWES	SUSSEX CO.	DE	08/15/2011	15:45	EST-5	Lightning		0	0	75.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	08/21/2011	18:25	EST-5	Lightning		0	0	50.00K	0.00K
MILTON	SUSSEX CO.	DE	08/21/2011	18:35	EST-5	Lightning		0	0	25.00K	0.00K
BLADES	SUSSEX CO.	DE	08/25/2012	15:39	EST-5	Lightning		0	0	25.00K	0.00K
GEORGETOWN ARPT	SUSSEX CO.	DE	08/25/2012	17:01	EST-5	Lightning		0	0	10.00K	0.00K
HARBESON	SUSSEX CO.	DE	08/25/2012	17:30	EST-5	Lightning		0	0	15.00K	0.00K
SELBYVILLE	SUSSEX CO.	DE	08/25/2012	21:11	EST-5	Lightning		0	0	5.00K	0.00K
OCEAN VIEW	SUSSEX CO.	DE	08/25/2012	23:37	EST-5	Lightning		0	0	50.00K	0.00K
DELMAR	SUSSEX CO.	DE	08/26/2012	00:32	EST-5	Lightning		0	0	300.00K	0.00K
MIDWAY	SUSSEX CO.	DE	08/26/2012	03:30	EST-5	Lightning		0	0	5.00K	0.00K
CHESTNUT KNOLL	SUSSEX CO.	DE	07/09/2015	19:45	EST-5	Lightning		0	0	5.00K	0.00K
Totals:								0	4	3.983M	0.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Due to the continuous and ongoing nature of the thunderstorm winds and lightning hazard threat, it was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated **Calculated Priority Risk Index (CPRI)** for Thunderstorm Wind is shown in ***Table 3-6*** below.

Table 3-6: CPRI for Degree of Risk for Thunderstorm Wind in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
4 x .45	+	2 x .30	+	2 x .15	+	2 x .10	=	2.9

Hurricane Wind

Hurricanes, tropical storms, nor'easters and typhoons, also classified as cyclones, are any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. Tropical cyclones are formed as a developing center moves over warm water, the pressure drops in the center of the storm and as the pressure drops, the system becomes better organized and the winds begin to rotate around the low pressure, pulling the warm and moist ocean air. Tropical cyclones can evolve from a tropical depression to a tropical storm to a hurricane as they intensify as shown in ***Table 3-8.*** In the Northern Hemisphere, hurricane winds rotate in a counter-clockwise direction with different wind speeds and characteristics in each quadrant, with the most severe effects in the right-front quadrant.

Table 3-8: Types of Tropical Cyclones

Name	Maximum Sustained Surface Wind Speed (Using the U.S. 1-minute average)		
Tropical Depression	33 kt or less	38 mph or less	62 km/hr or less
Tropical Storm	34kt to 63 kt	39 mph to 73 mph	63 km/hr to 118 km/hr
Hurricane	64 kt or more	74 mph or more	119 km/hr or more

Source: NOAA - National Oceanic and Atmospheric Administration, NHC - National Hurricane Center NHC. http://www.nhc.noaa.gov/aboutgloss.shtml#h

The Saffir-Simpson Hurricane Scale ***(Table 3-9)*** defines hurricane strength by categories, with a Category 1 storm being the weakest and Category 5 being the strongest. Depending on where and how hurricanes strike, it is possible for a lower category storm to inflict greater damage than a higher category storm.

Table 3-9: Saffir-Simpson Hurricane Scale

Category	Wind Speeds	Likely Effects
1	74 to 95 mph	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also some coastal road flooding and minor pier damage.
2	96 to 110 mph	Some roofing material, door, and window damage to buildings. Considerable damage to vegetation, mobile homes, and piers. Small craft in unprotected anchorages break moorings.
3	111 to 130 mph	Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures, mobile homes are destroyed. Flooding near the coast destroys smaller structures with larger structures damaged by floating debris. Terrain may be flooded well inland.
4	131 to 155 mph	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Major damage to lower floors of structures near the shore. Terrain may be flooded well inland.
5	155 mph or more	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Major damage to lower floors of all structures located near the shoreline. Massive evacuation of residential areas may be required.

Source: NOAA, National Hurricane Center (NHC).
http://www.nhc.noaa.gov/

A nor'easter is a cyclonic storm that moves along the East Coast of North America with winds that blow from a northeasterly direction. They may occur at any time of the year, but are most common and strongest in the winter months. These storms are usually most intense near New England and Canada. Nor'easters can produce heavy snow and rain, and may bring gale force winds greater than 58 miles per hour and can cause rough seas, coastal flooding, and beach erosion.[1] ***Table 3-10*** below shows an intensity scale proposed for nor'easters that is based upon levels of coastal degradation.

Table 3-10: Dolan-Davis Nor'easter Intensity Scale

Storm Class	Beach Erosion	Dune Erosion	Overwash	Property Damage
1 (Weak)	Minor changes	None	No	No
2 (Moderate)	Modest; mostly to lower beach	Minor	No	Modest
3 (Significant)	Erosion extends across beach	Can be significant	No	Loss of many structures at local level
4 (Severe)	Severe beach erosion and recession	Severe dune erosion or destruction	On low beaches	Loss of structures at community-scale
5 (Extreme)	Extreme beach erosion	Dunes destroyed over extensive areas	Massive in sheets and channels	Extensive at regional-scale; millions of dollars

Source: North Carolina Division of Emergency Management

Severe wind events resulting from hurricanes, tropical storms and nor'easters can cause widespread damage and loss life, as evidenced by the numerous coastal events that have impacted the State of Delaware. Although Delaware has not experienced a direct strike from a major hurricane in more than two decades (a fact often attributed to the geographic position of North Carolina), Delaware has experienced the effects of as many as 18 hurricanes and several significant tropical storm since the 1920s. Details of these events are presented below (Photos courtesy of the National Aeronautics and Space Administration (NASA). Historic hurricane track graphics courtesy of the National Hurricane Center). **Figure XX** graphically illustrates the paths of 15 storms that have passed directly through Sussex County since the earlier date of 1861.

Hurricane Hazel (1954)

Hurricane Hazel was first spotted east of the Windward Islands on October 5, 1954 and by October 15 the storm had turned north and accelerated—making landfall as a Category 4 hurricane near the North Carolina-South Carolina border. Subsequent rapid motion over the next 12 hours took the storm from the coast across the eastern United States and into southeastern Canada as it became extratropical. High winds occurred over large portions of the eastern United States. Washington, D.C. reported 78 MPH sustained winds, and peak gusts of over 90 MPH occurred as far northward as inland New York State. A storm surge of up to 18 feet inundated portions of the North Carolina coast. Heavy rains of up to 11 inches occurred as far northward as Toronto, Canada resulting in severe flooding. Hazel was responsible for 95 deaths (including at least one death in Delaware) and $281 million in damage in the United States; 100 deaths and $100 million in damage in Canada; and an estimated 400 to 1,000 deaths in Haiti.

Tropical Storm Bertha (1996)

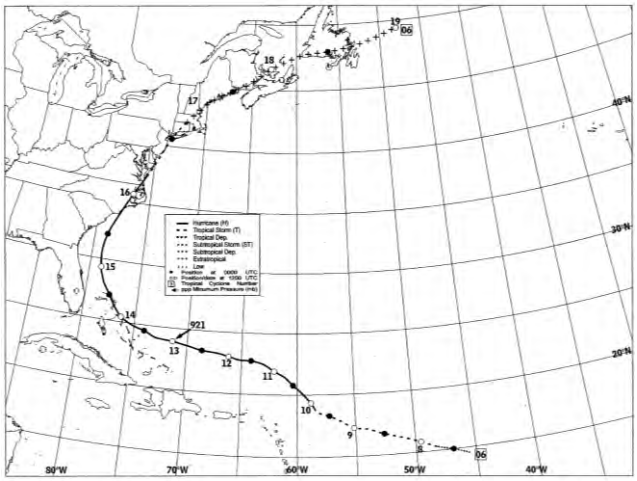
A weakening Tropical Storm Bertha passed across the state on July 13, 1996. While the long trip over land from Wilmington, North Carolina through Virginia to Delaware did weaken Bertha, some wind-related damage did occur in Sussex and Kent counties. The only tidal flooding reported was minor and occurred on Delaware State Route 54 near Fenwick Island, one of the most flood-prone roads in the state. Beach erosion was minor. The storm dropped between 1.5 and three inches of rain across most of the state, with locally higher amounts of around four inches reported in Sussex County. This caused some poor drainage flooding, but the only river to flood was the Christina in New Castle County in the northern part of the state. (NCDC, 2003)

Hurricane Edouard (1996)

On August 30, 1996, a hurricane watch and tropical storm warning was issued from Cape Lookout, North Carolina northward to Cape Henlopen, Delaware (including the Pamlico and Albermarle Sounds) in preparation for the approach of Hurricane Edouard. The hurricane watch was extended northward the following day to include north of Cape Henlopen, Delaware to Plymouth, Massachusetts. Early on September 2, Edouard veered sharply toward the northeast and the center of the hurricane passed about 75 nautical miles southeast of Nantucket Island, its closest point of approach to the United States.

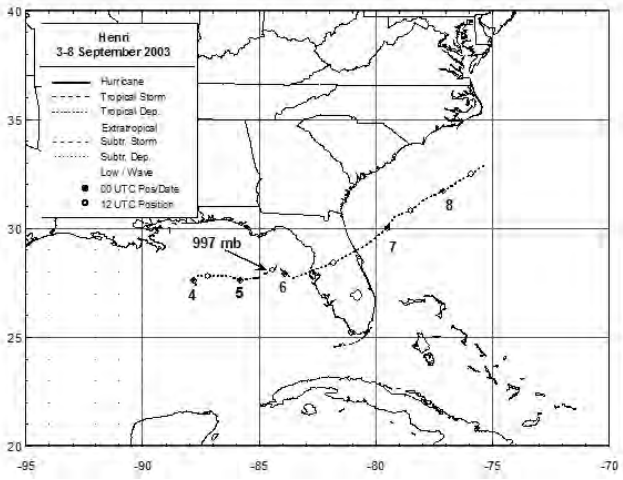
Hurricane Floyd (1999)

According to the National Climatic Data Center, a notable hurricane that has impacted the State of Delaware in recent history is Hurricane Floyd, which brought torrential rains and damaging winds on September 16, 1999. The hurricane caused widespread flash flooding as storm totals averaged around nine inches (10.58 inches in Sussex County). Most of this rain fell within a 12- hour period establishing a new state record. A total of $8 million in property damage was reported, along with two fatalities—the first hurricane-related deaths in the state since Hurricane Hazel in 1954. In addition, there were a number of injuries, at least two of which were serious. Overall, the event most heavily affected New Castle County.



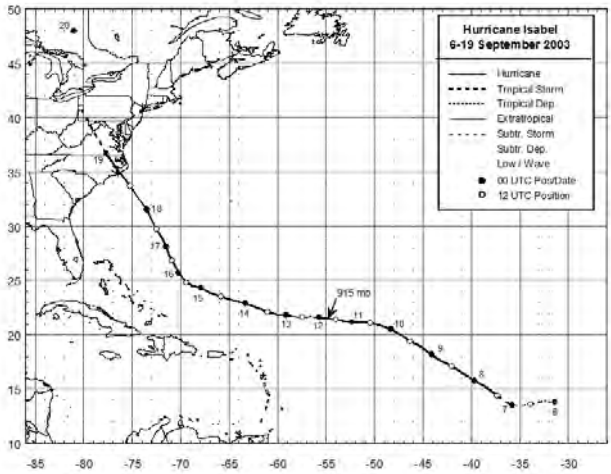
Tropical Storm Henri (Remnants—2003)

The National Weather Service reported that over a two-day period remnants of Tropical Storm Henri dumped eight (8) to 10 inches of rain in a narrow, slow- moving band that included central and northern Delaware, with 7.08 inches reported in Hockessin over a period of a few hours. Much of the region already had received above-normal rainfall in recent weeks



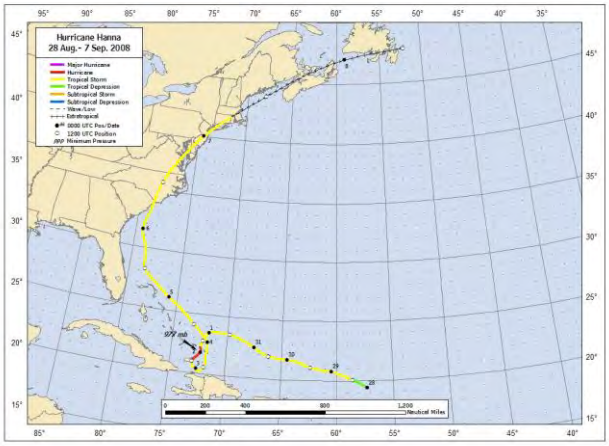
Hurricane Isabel (2003

Isabel developed as a tropical storm September 6 about 600 miles west of the Southern Cape Verde Islands. The following day the storm was upgraded to a hurricane and within five days Isabel became the first Category 5 hurricane in the Atlantic since Hurricane Mitch in 1998. Isabel made landfall along the U.S. East Coast on September 18 as a Category 2 storm. Seven federal disaster declarations were issued as a result of Isabel, including the State of Delaware. Isabel may become best known for the wide-spread power outages it caused. Two days after Isabel lashed Delaware with wind and rain, approximately 60,000 of Conectiv's 280,000 customers were without power. A spokesperson for the power company said that trees falling across power lines caused most of the outages.



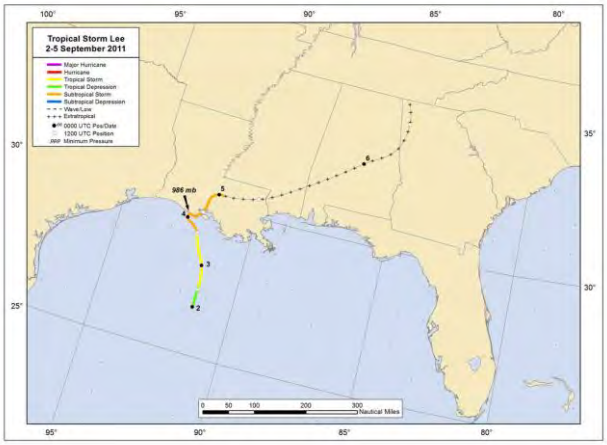
Tropical Storm Hanna (2008)

Tropical Storm Hanna brought heavy rain and strong winds in Delaware and some minor tidal flooding in Delaware Bay on the 6th. Rain moved into the region during the morning, fell heavy at times in the afternoon and ended during the early evening. Storm totals ranged from around 1 to around 3.5 inches. The strongest winds occurred during the late morning and afternoon with peak gusts as high as 53 mph (recorded in Slaughter Beach). About 10,000 homes and businesses lost power on the Delmarva Peninsula. All power was restored by the 7th. Minor tidal flooding occurred in Delaware Bay during the afternoon as the surge averaged two to three feet. Many planned outdoor activities were cancelled. The heavy rain caused minor roadway and low lying area flooding. The unseasonably dry weather leading into Hanna prevented stream and river flooding from occurring. The pounding surf caused about a three foot vertical cut to occur at Rehoboth Beach.



Tropical Storm Lee (7-10 Sept 2011)

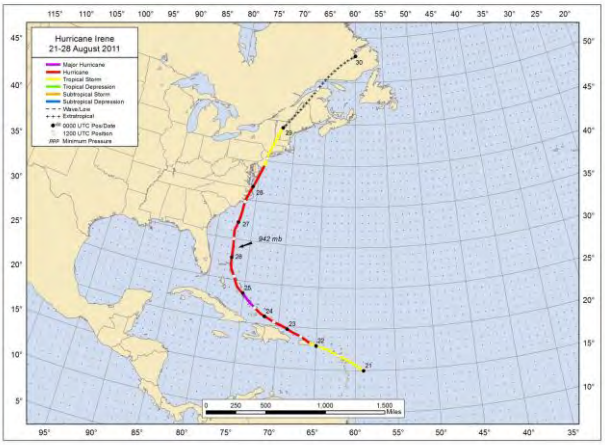
Lee was a tropical storm that evolved into a subtropical cyclone before making landfall in southern Louisiana. Lee and its remnants contributed to heavy rainfall and extensive flooding over portions of the eastern United States. Early on 4 September, Lee turned east-northeastward and accelerated, making landfall around 1030 UTC along the coast of southern Louisiana, about 10 n mi south-southeast of Intracoastal City. At the time of landfall, the maximum winds were occurring over water well to the south and east of the center. After landfall, Lee moved north-northeastward and then became nearly stationary over south-central Louisiana late on 4 September. Early on 5 September, Lee merged with an unusually strong cold front that was moving southward over the south-central United States, and it became extratropical by 0600 UTC. After Lee became extratropical, surface observations indicate that the cyclone strengthened. Moisture from Lee and its remnants spread northeastward along a frontal boundary that became stationary across the Mid-Atlantic States and southern New York. This produced a second area of extremely heavy rainfall from eastern Virginia northward across Maryland, Delaware, eastern Pennsylvania, New Jersey, southern New York, and portions of southern New England from 5 through 10 September. The rain over the Mid-Atlantic States fell over areas that had experienced a wet summer, including significant rains from Hurricane Irene less than two weeks before.



Hurricane Irene (21-28 August 2011)

Earl originated from a strong tropical wave that departed the west coast of Africa on 23 August. Data from both NOAA and Air Force hurricane hunter aircraft, along with satellite imagery, indicate that Earl intensified by 40-kt over 24 h, becoming a Category 4 hurricane by 1800 UTC 30 August. Earl then rapidly weakened as it turned northward and fell below major hurricane status by 0000 UTC 3 September. Earl weakened to a Category 1 hurricane later on 3 September while passing offshore of the mid-Atlantic and northeast United States coastline. Earl became extratropical by 0000 UTC 5 September in the Gulf of St. Lawrence, as it interacted with an upper-level low; this interaction also caused the system to slow down and turn toward the north.

In Delaware, the Governor ordered visitors to evacuate Delaware beaches effective 6:00 p.m. on August 25. In addition, he declared a state of emergency; shelters were scheduled to open throughout the state on August 26. The Cape May to Lewes Ferry across the Delaware Bay also suspended service for late August 27, through August 28, in response to the pending arrival of Hurricane Irene. Toll operations on Delaware State Route 1 halted in order to optimize evacuation rates along highways. Transit services were expected to be shut down on August 27 and 28, while bridges over the Chesapeake and Delaware Canal and the Indian River were closed due to high wind. A tornado watch was issued for Delaware in association with Irene at 10:40 a.m. August 27.

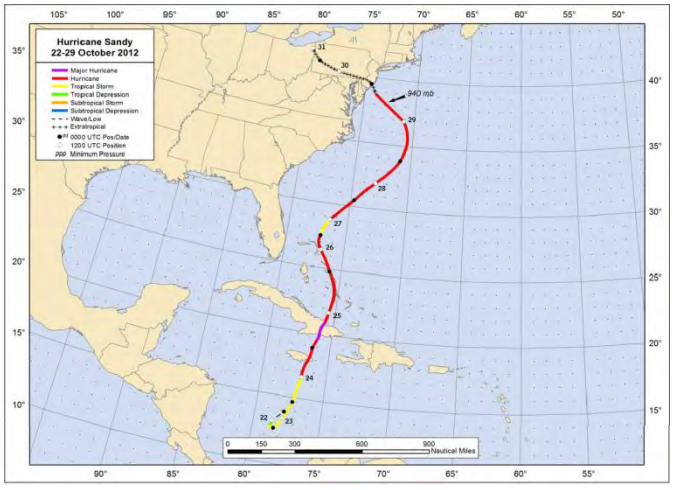


Hurricane Sandy (22-29 October 2012)

Sandy developed from a tropical wave in the western Caribbean Sea on October 22, quickly strengthened, and was upgraded to Tropical Storm Sandy six hours later. Sandy moved slowly northward. On October 24, Sandy became a hurricane, made landfall in Jamaica, and re-emerged a few hours later into the Caribbean Sea and strengthened into a Category 2 hurricane. On October 25, Sandy hit Cuba as a Category 3 hurricane, then weakened to a Category 1 hurricane. Early on October 26, Sandy moved through the Bahamas. On October 27, Sandy briefly weakened to a tropical storm and then re-strengthened to a Category 1 hurricane. Early on October 29, Sandy curved west-northwest (the "left turn" or "left hook") and moved ashore near Brigantine, New Jersey, with hurricane-force winds

On October 28, The Governor declared a state of emergency, with coastal areas of Sussex County evacuated In preparation for the storm, the state suspended weekend construction projects, removed traffic cones and barrels from construction sites, and removed several span-wire overhead signs in Sussex County. Delaware State route 1 through the Delaware Seashore State Park was closed due to flooding. Delaware roads were closed to the public, except for emergency and essential personnel, tolls on I-95 and Delaware State Route 1 were waived.

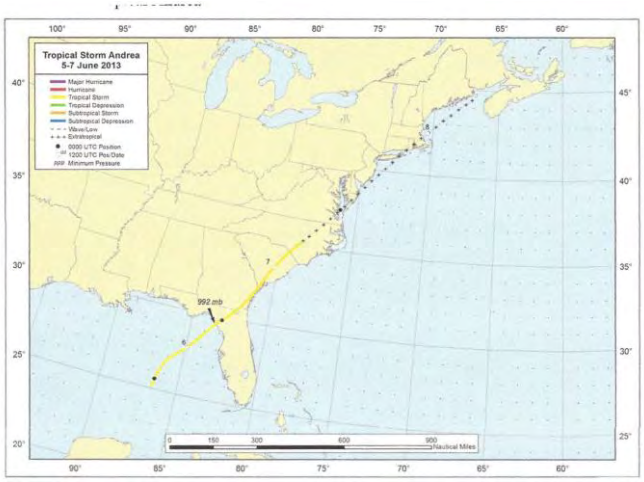
By the afternoon of October 29, rainfall at Rehoboth Beach totaled 6.53 inches. Other precipitation reports include nearly 7 inches at Indian River Inlet and more than 4 inches in Dover and Bea. At 4 p.m. on October 29, Delmarva power reported that more than 13,900 customers in Delaware and portions of the Eastern Shore of Maryland had lost electric service as high winds brought down trees and power lines. About 2,900 were in Sussex County. Some residents in Sussex County experienced power outages that lasted up to nearly six hours. At the peak of the storm, more than 45,000 customers in Delaware were without power. The Delaware Memorial Bridge speed limit was reduced to 25 mph and the two outer lanes in each direction were closed. Officials planned to close the span entirely if sustained winds were to exceed 50 mph A wind gust of 64 mph was measured at Lewes just before 2:30 p.m. on October 29, Delaware State route 1 was closed due to water inundation between Dewey Beach and Fenwick Island. In Dewey, flood waters were 1 to 2 feet in depth. Following the impact in Delaware, President of the United States Barack Obama declared the entire state a federal disaster area, providing money and agencies for disaster relief in the wake of Hurricane Sandy.



Tropical Andrea (5-7 June 2013)

After landfall, Andrea moved northeastward with additional acceleration across northeastern Florida and southeastern Georgia, with the center passing over Savannah, Georgia near 0700 UTC 7 June. During this time, the storm maintained an intensity of 40 kt, with the strongest winds occurring mainly over water to the east and southeast of the center. As the cyclone moved into South Carolina, it started to merge with a baroclinic zone, which caused Andrea to become extratropical over northeastern South Carolina by 1800 UTC that day. The center of the post-tropical cyclone moved rapidly across eastern North Carolina and southeastern Virginia, over the Atlantic near the New Jersey coast, and across eastern Long Island to eastern Massachusetts by 1100 UTC 8 June. The cyclone then moved over the Gulf of Maine, where it was absorbed late that day by a low pressure area developing over Nova Scotia.

Radar estimates of precipitation in Delaware were between 2 and 4 inches, while 5.19 inches was observed in Smyrna. Flash flooding occurred in areas of poor drainage, causing several road closures, especially in central Delaware.



Hurricane Arthur (1-5 July 2014)

Arthur formed east of Florida and made landfall along the North Carolina coast as a category 2 hurricane. After producing storm surge flooding and high winds on the Outer Banks, Arthur continued northeastward but stayed offshore of the Mid-Atlantic coast and New England, bringing minor impacts to southeastern Massachusetts. Arthur became an extratropical cyclone by the time it reached the Bay of Fundy just west of Nova Scotia and caused extensive tree damage and power outages across Atlantic Canada. On 3 July, Arthur turned north-northeastward and continued to accelerate. The hurricane continued to strengthen, passed to the east of Cape Fear, and reached its peak intensity of 85 kt on 4 July just off of the coast of North Carolina. Coastal radar data and aircraft reconnaissance data indicate that Arthur turned northeastward and made landfall on Shackleford Banks, just west of Cape Lookout, North Carolina. Strong upper-level winds and much colder sea surface temperatures caused Arthur to lose some strength and begin extratropical transition, and the cyclone weakened to a tropical storm on 5 July while located about 115 n mi east of Provincetown, Massachusetts (Cape Cod).

Arthur became an extratropical cyclone while over the Bay of Fundy just west of Nova Scotia.

Owing to Arthur's somewhat large size, strong winds and light rains impacted portions of the Delmarva Peninsula. In Virginia, sustained winds peaked at 55 mph at Rappahannock Light with gusts up to 60 mph. Tropical storm force winds were mostly confined to coastal areas of Delaware and Maryland. Maximum storm surge was 2.38 ft in Money Point Virginia and 2.34 ft in Lewes, Delaware.

Tropical Storm Ana (8-11 May 2015)

Ana transitioned to a tropical storm on 9 May when the cyclone was located about 115 nautical miles southeast of Myrtle Beach. Ana's intensity remained steady near 50 kt while the cyclone was over the warm waters of the Gulf Stream. Ana made landfall around on 10 May just southwest of North Myrtle Beach, South Carolina with an intensity of 40 kt. Shortly after making landfall, Ana slowed and turned northward and weakened to a tropical depression. On 11 May the cyclone turned northeastward and moved across eastern North Carolina. After degenerating into a remnant low on May 12, the system emerged off the coast of the Delmarva Peninsula back into the western Atlantic. Accelerating northeastward, the low passed south of New England and merged with a frontal system near Nova Scotia late on May 12.

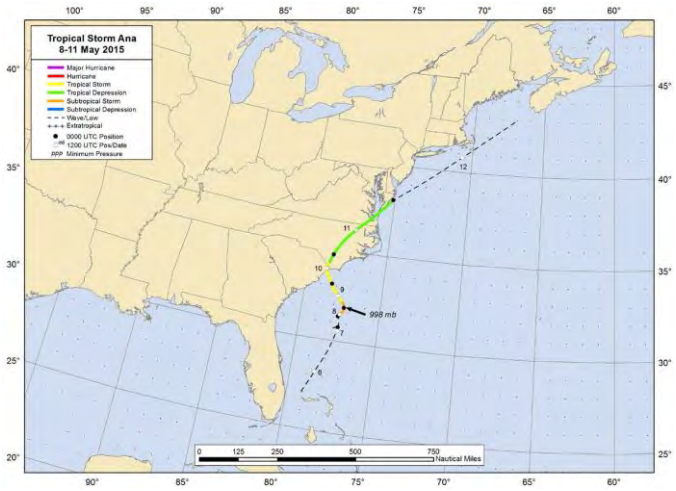
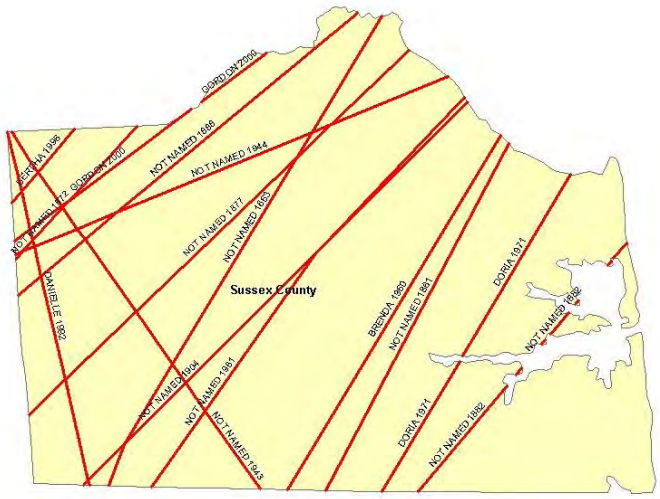


Figure XX Historical Coastal Storm Tracks



Occurrences and Probability of the Hurricane Hazard – (High Winds)

According to the National Climatic Data Center (NCDC) databases there have been twelve Hurricane or Tropical Storm events that have affected the region, 2010 Tropical Storm Lee, 2011 Hurricane Irene, 2012 Hurricane Sandy among them. As a consequence of hurricane and tropical storm events, there were zero reported injuries, zero deaths and reported damages in the amount of $8 million plus. Due to the continuous and ongoing nature of the hurricane hazard threat, it was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for Hurricane Wind is shown in ***Table 3-11*** below. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

Table 3-11: CPRI for Degree of Risk for Hurricane in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
4 x .45	+	2 x .30	+	2 x .15	+	2 x .10	=	2.9

Drought

A drought is defined as "a period of abnormally dry weather sufficiently prolonged for the lack of water to cause serious hydrologic imbalance in the affected area."[2] Droughts are extended periods of dry weather that cause problems such as crop damage, affects water supplies, and/or increased fire danger. Droughts are often brought on by lack of rainfall or snow over a long period of time, although the amount of time that low precipitation amounts take to impact an area varies in different geographic locations. The Palmer Drought Severity Index (PDSI) ***(Table 3-12)*** is the main classification system used for droughts in the United States and is based on supply and demand. The PDSI assesses total moisture by using temperature and precipitation to compute water supply and demand and soil moisture, and is most effective for long-term predictions. PDSI is also used to describe extended wet conditions using corresponding numbers, with zero representing near normal conditions. NOAA publishes weekly national and regional Palmer Drought maps. There are other indices that can be used for specific situations, ecosystems, or terrain.

Table 3-12: Palmer Drought Severity Index

PDSI	Description
4.0 or more	Extremely wet
3.0 to 3.99	Very wet
2.0 to 2.99	Moderately wet
1.0 to 1.99	Slightly wet
0.5 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.5 to -0.99	Incipient dry spell
-1.0 to -1.99	Mild drought
-2.0 to -2.99	Moderate drought
-3.0 to -3.99	Severe drought
-4.0 or less	Extreme drought

Source: NOAA - National Oceanic and Atmospheric Administration

[1] NOAA, from http://www.noaa.gov/features/03_protecting/noreasters.html

[2] Glossary of Meteorology (1959)

Table 3-12: Palmer Drought Severity Index

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4.0 or more	Extremely wet
3.0 to 3.99	Very wet
2.0 to 2.99	Moderately wet
1.0 to 1.99	Slightly wet
0.5 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.5 to -0.99	Incipient dry spell
-1.0 to -1.99	Mild drought
-2.0 to -2.99	Moderate drought
-3.0 to -3.99	Severe drought
-4.0 or less	Extreme drought

Source: NOAA - National Oceanic and Atmospheric Administration

Droughts are frequently classified as one of following four types: Meteorological, Agricultural, Hydrological, and Socio-economic.

Meteorological droughts are typically defined by the level of "dryness" when compared to an average, or normal amount of precipitation over a given period of time.

Agricultural droughts relate common characteristics of drought to their specific agricultural-related impacts. Emphasis tends to be placed on factors such as soil water deficits, water needs based on differing stages of crop development, and water reservoir levels.

Hydrological drought is directly related to the effect of precipitation shortfalls on surface and groundwater supplies. Human factors, particularly changes in land use, can alter the hydrologic characteristics of a basin.

Socio-economic drought is the result of water shortages that limit the ability to supply water- dependent products in the marketplace.

Occurrences and Probability of the Drought Hazard

According to the NCDC databases, since 2010 there has been one seven-month period of drought in 2012 that produced zero reported injuries, zero deaths and no reported damages as shown in ***Table 3-13.*** *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

Table 3-13: Sussex County Drought Event History

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	20.100M
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/30/1997	23:59	EST	Drought		0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/30/1997	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/31/1998	23:59	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	07/31/1998	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	08/31/1998	23:59	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	08/31/1998	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/30/1998	23:59	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/30/1998	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/31/1998	23:59	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	10/31/1998	23:59	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	11/30/1998	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	11/30/1998	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	12/14/1998	09:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/14/1998	09:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/31/1998	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	12/31/1998	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	05/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	05/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	07/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE	DELAWARE	DE	07/31/1999	23:59	EST	Drought		0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
BEACHES (ZONE)	BEACHES (ZONE)										
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/31/1999	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	08/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	08/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/01/1999	00:00	EST	Drought		0	0	0.00K	20.100M
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/01/1999	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/31/2000	23:59	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	10/31/2000	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	04/30/2001	23:59	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	04/30/2001	23:59	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	05/01/2001	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	05/01/2001	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/01/2001	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	10/01/2001	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	11/01/2001	00:01	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	11/01/2001	00:01	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	12/01/2001	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/01/2001	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES / X E	DELAWARE BEACHES / X E	DE	02/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
SUSSEX ...	SUSSEX ...										
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	03/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	04/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	04/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	05/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	05/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	06/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	07/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	08/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	08/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	11/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	11/01/2002	00:00	EST	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/01/2005	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/01/2005	00:00	EST	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/24/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE	DELAWARE	DE	07/24/2007	00:00	EST-	Drought		0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
BEACHES (ZONE)	BEACHES (ZONE)				5						
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	08/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	11/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	11/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	12/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/01/2007	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	03/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	04/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	04/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	05/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	05/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	08/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	08/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/01/2008	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	04/10/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	04/10/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	05/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	05/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	07/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	08/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	08/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	09/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	09/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	10/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	10/01/2012	00:00	EST-5	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	20.100M

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Due to the continuous and ongoing nature of the drought hazard threat, it was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for Drought is shown in ***Table 3-14*** below.

Table 3-14: CPRI for Degree of Risk for Drought in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
3 x .45	+	2 x .30	+	1 x .15	+	4 x .10	=	2.05

Extreme Heat/Cold

Extreme heat can be defined as temperatures that hover 10 degrees or more above the average high temperature for the region, last for prolonged periods of time, and are often accompanied by high humidity. Under normal conditions, the human body's internal thermostat produces perspiration that evaporates and cools the body. However, in extreme heat and high humidity, evaporation is slowed and the body must work much harder to maintain a normal temperature. Elderly persons, young children, persons with respiratory difficulties, and those who are sick or overweight are more likely to become victims of extreme heat. Because men sweat more than women, they are more susceptible to heat- related illness because they become more quickly dehydrated. Studies have shown that a significant rise in heat-related illness occur when excessive heat persists for more than two days. Heat related disorder probabilities are shown in ***Figure 3-2***, with ***Table 3-15*** showing the history of extreme heat events in Sussex County. Spending at least two hours per day in air conditioning can significantly reduce the number of heat-related illnesses.

Extreme heat in urban areas can create health concerns when stagnant atmospheric conditions trap pollutants, thus adding unhealthy air to excessively hot temperatures. In addition, the "urban heat island effect" can produce significantly higher nighttime temperatures because asphalt and concrete (which store heat longer) gradually release heat at night.

Along the eastern seaboard of the United States, periods of hotter than normal temperatures, often with high levels of humidity, can occur in the summer. These extreme temperature events can last a day to a week or longer. It is usually considered a heat wave in this area when the temperature rises above 90 degrees Fahrenheit, accompanied by high humidity. NOAA states that a *heat wave* is a period of abnormally and uncomfortably hot and unusually humid weather. Typically, a heat wave lasts two or more days[3]

NOAA's National Weather Service has created the Heat Index (HI) that combines relative humidity and actual air temperature to try to accurately measure how hot the air feels to the human body, and then demonstrate the potential health effects.

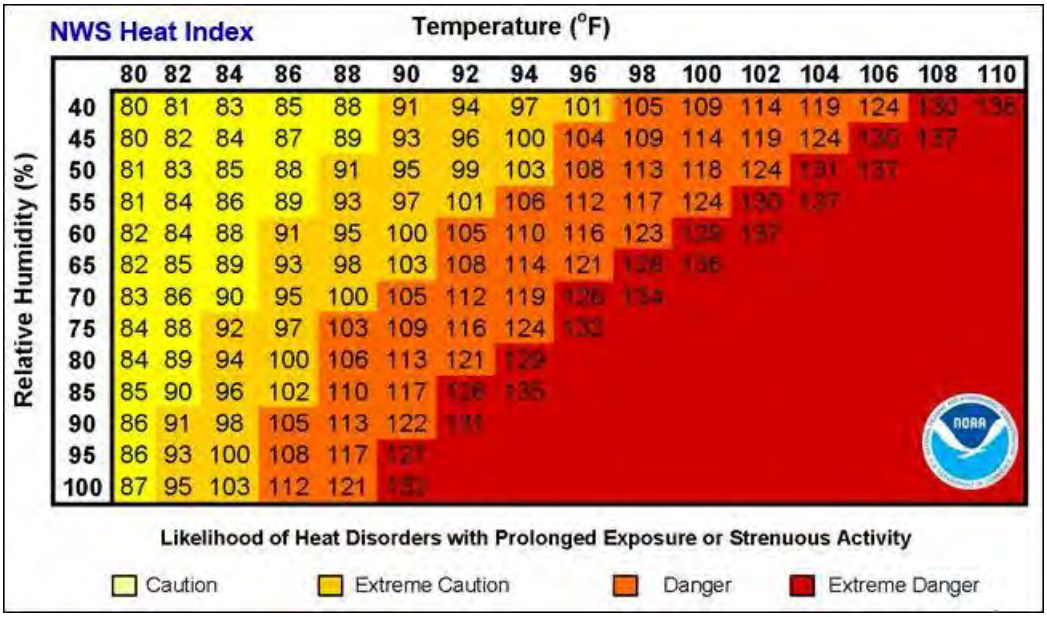


Figure 3-1: NOAA's National Weather Heat Index

Source: *Source: NOAA - National Oceanic and Atmospheric Administration http://www.weather.gov/om/heat/heatindex.shtml*

[3] NOAA- http://w1.weather.gov/glossary/index.php?letter=h

Table 3-15: Sussex County Extreme Heat Event History

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/31/2000	23:59	EST	Excessive Heat		0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	03/31/2000	23:59	EST	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	05/02/2001	11:00	EST	Excessive Heat		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	05/02/2001	11:00	EST	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/26/2007	11:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/08/2007	11:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	07/08/2007	11:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	08/07/2007	11:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	08/07/2007	11:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	08/25/2007	10:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/07/2008	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/09/2008	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/16/2008	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	07/16/2008	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	08/10/2009	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/23/2010	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/23/2010	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	06/27/2010	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/27/2010	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/05/2010	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	07/23/2010	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/23/2010	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/21/2011	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	07/21/2011	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/18/2013	09:00	EST-5	Excessive Heat		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Severe winter weather may include one or more of the following: snowstorms, blizzards, sleet, freezing rain, ice storms, and extreme cold temperatures. Extreme cold temperatures are characterized by the ambient air temperature dropping to approximately 0 degrees Fahrenheit or below.

Significant snowstorms are characterized by a rapid accumulation of snow, while a blizzard is categorized as a snowstorm with winds of 35 miles per hour or greater and/or visibility of less than ¼ mile for three or more hours. Many of these types of storms can immobilize a region, cause treacherous roadways, power outages, and property damage or collapse.

Although there is no widely used scale to classify snowstorms, the National Weather Service (NWS) developed the Northeast Snowfall Impact Scale (NESIS). NESIS classifies high impact Northeast snowstorms that have large areas of 10-inch snowfall accumulations or more. The index utilizes population information in addition to meteorological measurements for an indication of the storm's impacts on society. The five categories are: Extreme (5), Crippling (4), Major (3), Significant (2), and Notable (1). NOAA's National Weather Service (NWS) in cooperation with a team of universities and other agencies developed the current wind chill temperature index (WCT) formula in 2001.[4] WCT uses wind speed at 5 feet (the average height of a human's face), incorporates heat loss from the body, is based on a human face model, utilizes 3 miles per hour as the calm wind threshold, uses a consistent standard for skin tissue resistance and assumes a clear night sky for solar radiation. The history of extreme cold events in Sussex County is shown in ***Table 3-16***.

Table 3-16: Sussex County Extreme Cold Event History

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								2	2	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/05/2007	03:00	EST-5	Extreme Cold/wind Chill		0	0	0.00K	0.00K

DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/05/2007	03:00	EST-5	Extreme Cold/wind Chill		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/06/2007	03:00	EST-5	Extreme Cold/wind Chill		1	1	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/06/2007	03:00	EST-5	Extreme Cold/wind Chill		1	1	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/04/2014	01:00	EST-5	Extreme Cold/wind Chill		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/04/2014	01:00	EST-5	Extreme Cold/wind Chill		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/22/2014	00:00	EST-5	Extreme Cold/wind Chill		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/22/2014	00:00	EST-5	Extreme Cold/wind Chill		0	0	0.00K	0.00K
Totals:								2	2	0.00K	0.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Although there have been no recorded deaths, injuries, or damage from extreme heat/cold events in Sussex County since the plan update in 2010 as shown in ***Table 3-15 and 3-16,*** this hazard was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for Extreme Heat/Cold is shown in ***Table 3-17*** below. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

Table 3-17: CPRI for Degree of Risk for Extreme Heat/Cold in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
3 x .45	+	1 x .30	+	1 x .15	+	3 x .10	=	2.1

[4] NOAA. Retrieved from http://www.crh.noaa.gov/lsx/?n=winterday

Winter Storm

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Some winter storms may be large enough to affect several states, while others may affect only a single community. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow, which can severely impair visibility.

Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Sleet, raindrops that freeze into ice pellets before reaching the ground, usually bounce when hitting a surface and do not stick to objects. However, sleet can accumulate like snow and cause a hazard to motorists. Freezing rain is rain that falls onto a surface with a temperature below freezing, forming a glaze of ice. Even small accumulations of ice can cause a significant hazard, especially on power lines and trees. An ice storm occurs when freezing rain falls and freezes immediately upon impact. Communications and power can be disrupted for days, and even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Although there have been no recorded deaths, injuries, or recorded damage from winter storm events in Sussex County since the plan update in 2010 as shown in ***Table 3-18***, this hazard was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for Winter Storm is shown in ***Table 3-19***.

Table 3-18: Sussex County Winter Storm Event History

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								1	5	6.300M	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/06/1996	23:00	EST	Winter Storm		0	0	100.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/06/1996	23:00	EST	Winter Storm		0	0	400.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/02/1996	03:00	EST	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/02/1996	03:00	EST	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	12/23/1998	16:00	EST	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/25/2000	01:00	EST	Winter Storm		0	5	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/25/2000	01:00	EST	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX	INLAND SUSSEX	DE	12/05/2002	02:00	EST	Winter		0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
(ZONE)	(ZONE)					Storm					
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/06/2003	20:30	EST	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/16/2003	03:00	EST	Winter Storm		0	0	1.300M	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/16/2003	03:00	EST	Winter Storm		0	0	500.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/22/2005	09:00	EST	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/12/2006	06:00	EST	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/01/2009	15:00	EST-5	Winter Storm		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	03/01/2009	15:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	12/18/2009	23:00	EST-5	Winter Storm		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	12/18/2009	23:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/05/2010	14:00	EST-5	Winter Storm		0	0	500.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/05/2010	14:00	EST-5	Winter Storm		0	0	500.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	02/09/2010	19:00	EST-5	Winter Storm		1	0	1.500M	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	02/09/2010	20:00	EST-5	Winter Storm		0	0	1.500M	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	01/02/2014	20:00	EST-5	Winter Storm		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	01/02/2014	21:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/03/2014	04:00	EST-5	Winter Storm		0	0	0.00K	0.00K
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	03/03/2014	06:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/01/2015	09:00	EST-5	Winter Storm		0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/05/2015	11:00	EST-5	Winter Storm		0	0	0.00K	0.00K
Totals:								1	5	6.300M	0.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Table 3-19: CPRI for Degree of Risk for Winter Storm in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
3 x .45	+	1 x .30	+	1 x .15	+	2 x .10	=	2

Tornado

Tornadoes are defined as violently rotating columns of air extending from thunderstorms down to the ground. Tornadoes are unpredictable and can occur at any time of day or night, and at any season throughout the year. The Fujita Tornado Scale (F-Scale) was introduced in 1971, and is a damage scale (not a wind speed scale) that categorizes each tornado by intensity and area.[5] The F-Scale categories range from low intensity F0 with estimated wind speeds of 40 to 72 miles per hour up to F5, with estimated wind speeds of over 260 miles per hour. In 2007, the Enhanced Fujita Scale (EF-Scale) was introduced, and although it relates to the original Fujita Scale, it is more complex and has different wind speed ranges associated with the classifications.[6] **Table *3-20*** on the following page illustrates the comparison in wind speed rage between the two scales.

Table 3-20: F-Scale and EF-Scale Wind Speed Range Comparison

F-Scale			EF-Scale	
F-Scale	**Fastest ¼-mile Wind Speeds (mph)**	**3-Second Gust Speed (mph)**	**EF-Scale**	**3-Second Gust Speed (mph)**
F0	40 - 72	45 - 78	EF0	65 - 85
F1	73 - 112	79 - 117	EF1	86 - 109
F2	113 – 157	118 – 161	EF2	110 – 137
F3	158 207	162 – 209	EF3	138 – 167
F4	208 – 260	210 – 261	EF4	168 – 199
F5	261 – 318	262 – 317	EF5	200 - 234

Source: Wind Science and Engineering Center at Texas Tech University and NOAA/National Weather Service.

Occurrences and Probability of the Tornado Hazard – (High Winds)

Since 1955 there have been two F2 tornados, eight F1 tornados and eight F0 tornados according to the NCDC databases. As a consequence of the 19 tornado events, there were 11 reported injuries, zero deaths and reported damages in the amount of $593,500 as shown in ***Table 3-21***. Since completion of the 2010 Multi-Jurisdictional All Hazard Mitigation Plan there has been one occurrence of a tornado within the County. In 2011, Sussex County experienced an EF 1 near Nassau that resulted in no human casualties or reported property damages as shown in ***Table 3-22***. The calculated CPRI degree of risk for Sussex County is shown in ***Table 3-23***. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

[5] "Proposed Characterization of Tornadoes and Hurricanes by Area and Intensity" (Feb, 1971). Dr. T. Fujita

[6] NOAA from http://www.spc.noaa.gov/efscale/

Table 3-21: Sussex County Tornado Event History

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
SUSSEX CO.	SUSSEX CO.	DE	08/12/1955	15:26	CST	Tornado	F2	0	1	2.50K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/05/1957	16:00	CST	Tornado	F1	0	0	2.50K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	09/10/1957	16:24	CST	Tornado	F1	0	0	2.50K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/24/1962	17:00	CST	Tornado	F1	0	0	25.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	03/19/1975	10:15	CST	Tornado	F1	0	0	2.50K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/04/1975	12:30	CST	Tornado	F0	0	0	2.50K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/30/1976	12:30	CST	Tornado	F0	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/08/1984	16:30	CST	Tornado	F1	0	8	250.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/08/1984	16:30	CST	Tornado	F1	0	2	250.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/18/1984	07:30	CST	Tornado	F2	0	0	25.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/15/1989	13:09	EST	Tornado	F1	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/15/1992	18:00	EST	Tornado	F1	0	0	25.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/15/1992	18:00	EST	Tornado	F0	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/15/1992	18:00	EST	Tornado	F0	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/28/1992	16:20	CST	Tornado	F0	0	0	0.00K	0.00K
to 1 S Bridgeville	SUSSEX CO.	DE	04/01/1993	19:15	EST	Tornado	F0	0	0	5.00K	0.00K
Bridgeville	SUSSEX CO.	DE	06/26/1995	13:15	EST	Tornado	F0	0	0	1.00K	0.00K
DEWEY BEACH	SUSSEX CO.	DE	08/13/1998	12:33	EST	Tornado	F0	0	0	0.00K	0.00K
NASSAU	SUSSEX CO.	DE	08/27/2011	17:38	EST-5	Tornado	EF1	0	0	0.00K	0.00K
Totals:								0	11	593.50K	0.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=10,DELAWARE

Table 3-22: Sussex County 2011 Tornado Event

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	C
NASSAU	SUSSEX CO.	DE	08/27/2011	17:38	EST-5	Tornado	EF1	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Table 3-23: CPRI for Degree of Risk for Tornados in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
0 x .45	+	0 x .30	+	0 x .15	+	0 x .10	=	0

Hail

Hailstorms are an outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation—as balls or irregularly shaped masses of ice greater than 0.75 in. (1.91 cm) in diameter.

The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size. ***Figure 3-3*** on the following page shows the annual frequency of hailstorms in the United States.

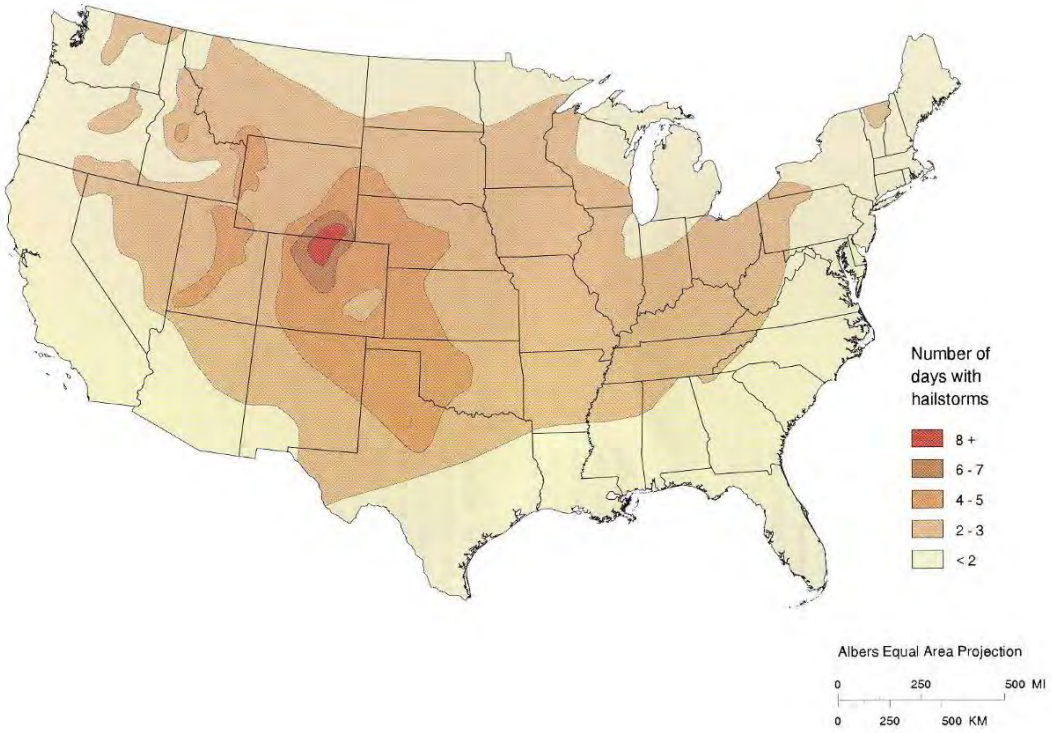


Figure 3-3: Annual Frequency of Hailstorms in the United States

Source: Federal Emergency Management Agency

During the intervening years covered by this hazard mitigation plan update, Sussex County has experienced four additional hail storms of note as depicted by the NCDC records in ***Table 3-24*** below.

Table 3-24: Sussex County Hail Event

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	10.05K	300.00K
SUSSEX CO.	SUSSEX CO.	DE	05/30/1968	14:30	CST	Hail	1.00 in.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/27/1968	21:00	CST	Hail	1.00 in.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/03/1969	13:00	CST	Hail	1.00 in.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	05/24/1974	16:10	CST	Hail	1.50 in.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/30/1976	13:30	CST	Hail	1.75 in.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	06/30/1976	13:30	CST	Hail	2.00 in.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	04/26/1977	11:00	CST	Hail	1.75 in.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	08/11/1983	18:00	CST	Hail	1.75 in.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	07/27/1988	13:22	CST	Hail	1.75 in.	0	0	0.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	03/31/1989	14:15	CST	Hail	0.75 in.	0	0	0.00K	0.00K
Seaford	SUSSEX CO.	DE	04/01/1993	18:35	EST	Hail	1.75 in.	0	0	5.00K	0.00K
SUSSEX CO.	SUSSEX CO.	DE	04/01/1993	19:00	EST	Hail	1.75 in.	0	0	5.00K	0.00K
Millsboro	SUSSEX CO.	DE	08/05/1994	15:23	EST	Hail	0.75 in.	0	0	0.05K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
OAK ORCHARD	SUSSEX CO.	DE	03/29/1997	15:15	EST	Hail	1.00 in.	0	0	0.00K	0.00K
GREENWOOD	SUSSEX CO.	DE	06/26/1997	16:20	EST	Hail	1.00 in.	0	0	0.00K	0.00K
BETHANY BEACH	SUSSEX CO.	DE	07/16/1997	14:32	EST	Hail	1.00 in.	0	0	0.00K	0.00K
DELMAR	SUSSEX CO.	DE	06/16/1998	19:35	EST	Hail	1.00 in.	0	0	0.00K	0.00K
HARBESON	SUSSEX CO.	DE	04/21/2000	19:05	EST	Hail	0.88 in.	0	0	0.00K	0.00K
LAUREL	SUSSEX CO.	DE	07/03/2002	15:29	EST	Hail	1.75 in.	0	0	0.00K	0.00K
DELMAR	SUSSEX CO.	DE	05/16/2004	19:52	EST	Hail	1.00 in.	0	0	0.00K	0.00K
MILLSBORO	SUSSEX CO.	DE	04/15/2006	00:10	EST	Hail	1.00 in.	0	0	0.00K	0.00K
LAUREL	SUSSEX CO.	DE	06/11/2007	17:30	EST-5	Hail	0.88 in.	0	0	0.00K	0.00K
REHOBOTH BEACH	SUSSEX CO.	DE	08/10/2008	11:27	EST-5	Hail	0.88 in.	0	0	0.00K	0.00K
REHOBOTH BEACH	SUSSEX CO.	DE	08/15/2008	14:20	EST-5	Hail	0.88 in.	0	0	0.00K	0.00K
GREENWOOD	SUSSEX CO.	DE	06/13/2009	16:10	EST-5	Hail	1.00 in.	0	0	0.00K	300.00K
SYCAMORE	SUSSEX CO.	DE	06/13/2009	17:14	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
FENWICK IS	SUSSEX CO.	DE	07/28/2009	14:07	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
DELMAR	SUSSEX CO.	DE	08/19/2011	14:12	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
BLADES	SUSSEX CO.	DE	02/24/2012	16:15	EST-5	Hail	1.00 in.	0	0	0.00K	0.00K
MILLSBORO	SUSSEX CO.	DE	07/08/2012	19:47	EST-5	Hail	0.75 in.	0	0	0.00K	0.00K
ELLENDALE	SUSSEX CO.	DE	05/22/2014	16:30	EST-5	Hail	1.25 in.	0	0	0.00K	0.00K
Totals:								0	0	10.05K	300.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Occurrence and Future Probability of Hail Hazard

According to NCDC databases, since 2010 there have been four hail events within Sussex County that resulted in no losses. Hail was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for hail is shown in ***Table 3-25*** on the following page. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

***Table 3-25*: CPRI for Degree of Risk for Hail in Sussex County**

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
2 x .45	+	1 x .30	+	3 x .15	+	1 x .10	=	1.75

Tsunami

The word tsunami is Japanese and means "harbor wave." A tsunami is a series of great waves that are created by undersea disturbances such as earthquakes or volcanic eruptions. From the area of disturbance, tsunami waves will travel outward in all directions. Tsunamis can originate hundreds or even thousands of miles away from coastal areas.

The time between wave crests may be five to 90 minutes and the open ocean wave speed may average 450 miles per hour. As tsunami waves approach shallow coastal waters, they appear normal size and the speed decreases until the waves near the shoreline, where it may grow to great height and crash into the shore. Areas at greatest risk are less than 50 feet above sea level and within one mile of the shoreline. Rapid changes in the ocean water level may indicate that a tsunami is approaching. Most deaths during a tsunami are the result of drowning. Associated risks include flooding, polluted water supplies, and damaged gas lines.

In the United States, tsunamis have historically affected the West Coast, but the threat of tsunami inundation is also possible on the Atlantic Coast. Pacific Ocean tsunamis are classified as local, regional, or Pacific-wide. Regional tsunamis are most common. In 1949, the Pacific Tsunami Warning Center was established at Ewa Beach, Hawaii to monitor conditions in the Pacific Ocean and to provide warnings in case of tsunamis. According to the Pacific Tsunami Warning Center, 796 tsunamis were observed or recorded in the Pacific Ocean between 1900 and 2001. Approximately 117 caused casualties and damage and at least nine caused widespread destruction throughout the Pacific. The greatest number of tsunamis during any one-year was 19 in 1938, but all were minor and caused no damage. There was no single year of the period that was free of tsunamis.

Sussex County was subjected to a tsunamis strike on June 13, 2013. There was no recorded damage, as illustrated in ***Table 3-26*** on the following page. In fact, it is not widely known that a tsunami actually occurred.

Table 3-26: Sussex County Tsunami Event [7]

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
DELAWARE BEACHES (ZONE)	DELAWARE BEACHES (ZONE)	DE	06/13/2013	10:00	EST-5	Tsunami		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Prioritization and Rationale of the Tsunami Hazard

Although there have been no previously recorded deaths, injuries, or damage from tsunami in Sussex County, there has been an event and was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for tsunami is shown in ***Table 3-27*** below.

Table 3-27: CPRI for Degree of Risk for Tsunami in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
1 x .45	+	1 x .30	+	1 x .15	+	1 x .10	=	1

Earthquake

An earthquake is a sudden, rapid movement of the earth caused by the breaking and shifting of rock beneath the earth's surface. The earth's surface is broken into shifting slabs or tectonic plates, which continents move along with. At the plate boundaries, the plates interact by sliding past one another, running into one another, or moving away from one another. Sometimes these movements are slow and gradual, at other times the plates are locked together unable to release the accumulating energy. Most active faults are located along or near boundaries between shifting plates, although some are located in the interior of plates (intra-plate earthquakes, such as the New Madrid Fault).

Earthquakes occur when rock suddenly moves, or slips, along these faults and accumulated energy is then released. This energy causes seismic waves that when strong enough, may be experienced s as ground shaking. The amount of energy released, combined with the physical environment, will impact the amount of damage to buildings and infrastructure. Smaller magnitude earthquakes, called aftershocks, often follow the main earthquake. Earthquakes may also cause additional hazards such as ground rupture, landslides, avalanches, fires, soil liquefaction, tsunamis, floods, and tidal forces. There are two main types of scales for measuring earthquakes: intensity and magnitude.

Intensity scales measure the amount of shaking at a particular location, so the intensity of an earthquake will vary depending on the location, although people tend to use the maximum intensity level produced when referring to a particular earthquake. Intensity is determined from effects on people, structures, and the natural environment. Intensity scales include the Modified Mercalli Scale, shown in ***Table 3-28*** on the following page. The Richter scale was succeeded in the 1970s by the moment magnitude scale (Modified Mercalli Scale).

Magnitude scales measure the energy released or size of the earthquake at its source, so it will not vary based on location. Magnitude is determined from measurements on seismographs. Magnitude scales include the Richter Magnitude (Local Magnitude) and Moment Magnitude. Moment Magnitude Scale is newer and more precise, but more complex to calculate.

[7] http://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType

Table 3-28: Abbreviated Modified Mercalli Intensity Scale

Mercalli Intensity	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: US Geological Survey (USGS). Retrieved from http://earthquake.usgs.gov/learn/topics/mercalli.php

Magnitude is measured using the Richter Scale. The Richter Scale is an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude. Each unit increase in magnitude on the Richter Scale corresponds to a ten-fold increase in wave amplitude, or a 32-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity Scale based on direct and indirect measurements of seismic effects. A description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is shown in **Table *3-29*** on the following page**.**

Table 3-29: Modified Mercalli Intensity Scale for Earthquakes

Scale	Intensity	Description of Effects	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs	
II	Feeble	Some people feel it	<4.2
III	Slight	Felt by people resting; like a truck rumbling by	
IV	Moderate	Felt by people walking	
V	Slightly Strong	Sleepers awake; church bells ring	<4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	<5.4
VII	Very Strong	Mild Alarm; walls crack; plaster falls	<6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	<6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	<8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	>8.1

The most recent earthquake "felt" in Delaware occurred in southern New Jersey in December 1968. Wilmington residents noted slight effects of the Richter magnitude 2.5 tremor, which caused no damage as it rumbled through New Jersey, Pennsylvania, and Delaware. Seismic activity within the state of Delaware is depicted in ***Figure 3-4*** on the following page.

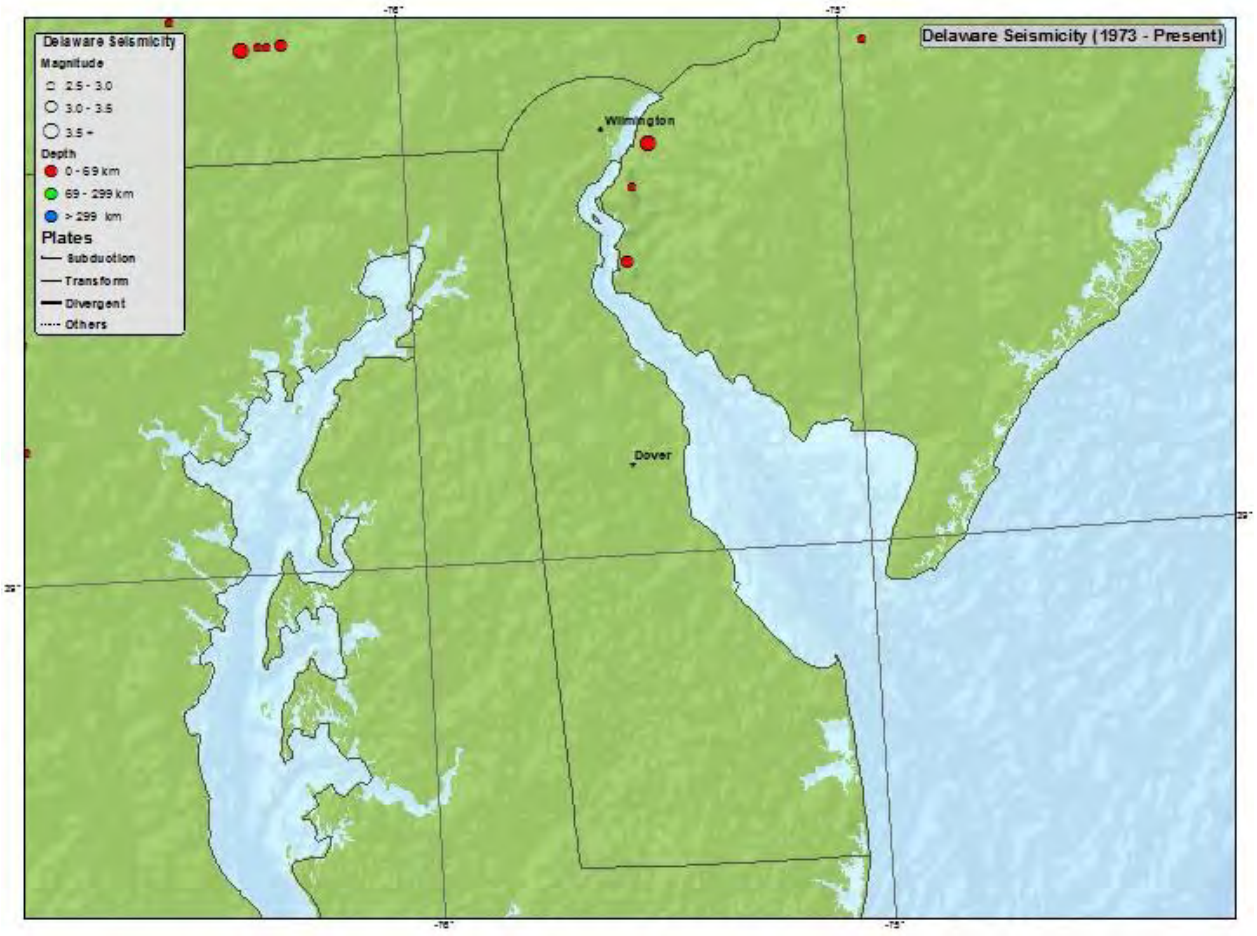


Figure3-4: Delaware Seismicity Activity Map - 1973 to March 2012

Source: USGS - United States Geologic Service
USGS - http://earthquake.usgs.gov/earthquakes/states/delaware/seismicity.php

Prioritization and Rationale of the Earthquake Hazard

Although there have been no previously recorded deaths, injuries, or damage from earthquakes in Sussex County, the hazard was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. There has been no event occurrence since the last hazard mitigation update, thus no measurable data to generate a CPRI rating for earthquake. Thus earthquake remains unranked as show in ***Table 3-30***. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

Table 3-30: CPRI for Degree of Risk for Earthquake in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
0 x .45	+	0 x .30	+	0 x .15	+	0 x .10	=	0

Wildfire

A wildfire is any fire that burns out of control and typically occurs in grasslands, forest, brush land, etc. Wildfire is a natural process that is important to ecosystems, and fire suppression can lead to more severe fires due to the buildup of vegetation, which creates more fuel. However, wildfires can also endanger the lives of people and destroy property when out of control. Wildfires can also cause secondary effects including erosion, landslides, introduction of invasive species, and changes in water quality. Wildfires can be caused by lightning strikes, but are most often the intentional or unintentional result of humans.

According to the NCDC databases, there have been 10 wildfire events within Sussex County between 2000 and 2006 that have resulted in losses as shown in Figure 45: Sussex County Wildfire Event History. Two different wildfires caused one injury and $5,000 in reported damages. There have been no reported wildfires within Sussex County since 2006.

Table 3-31: Sussex County Wildfire Event History

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
DAGSBORO	SUSSEX CO.	DE	05/18/2000	17:00	EST	Wildfire	0	0	0	0.00K	0.00K
GEORGETOWN	SUSSEX CO.	DE	02/24/2002	07:00	EST	Wildfire	0	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/06/2002	12:00	EST	Wildfire	0	0	0	0.00K	0.00K
DELAWARE BEACHES / X E SUSSEX ...	DELAWARE BEACHES / X E SUSSEX ...	DE	07/06/2002	12:00	EST	Wildfire	0	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	07/09/2004	18:00	EST	Wildfire	0	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	04/06/2005	15:09	EST	Wildfire	0	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	04/13/2005	13:30	EST	Wildfire	0	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/14/2006	12:00	EST	Wildfire	0	0	0	5.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	03/22/2006	12:00	EST	Wildfire	0	0	0	0.00K	0.00K
INLAND SUSSEX (ZONE)	INLAND SUSSEX (ZONE)	DE	04/27/2006	15:00	EST	Wildfire	0	0	1	0.00K	0.00K
Totals:							0	1	5.00K	0.00K	

Source: NOAA - National Oceanic and Atmospheric Administration - NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventTypestatefips=10%2CDELAWARE

Prioritization and Rationale of the Wildfire Hazard

Although there have been no previously recorded deaths, only one injury, and minimal damage from wildfire in Sussex County, there have been enough events for the HMSC and the HMWG to consider wildfire to be of significant danger to the community and thus included as an identified hazard. There has been no event occurrence since the last hazard mitigation update, thus no measurable data to generate a CPRI rating for wildfire. Thus wildfire remains unranked as show in ***Table 3-32*** on the following page. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

Table 3-32: CPRI for Degree of Risk for Wildfire in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
0 x .45	+	0 x .30	+	0 x .15	+	0 x .10	=	0

Coastal Erosion

Coastal erosion is the process of wearing away material from a coastal profile due to imbalance in the supply and export of material from a certain section. It takes place in the form of scouring in the foot of the cliffs or dunes or at the sub-tidal foreshore. Coastal erosion takes place mainly during strong winds, high waves and high tides and storm surge conditions, and results in coastline retreat and loss of land.

This is a simplification of the processes involved and these will vary according to the types of coast in question, cliff, coarse gravel or sandy beaches, etc. What is clear from this description is that coastal erosion is a dynamic process. It is often event-driven (a storm) and its consequences may be at least partially reversed during calmer periods. Such events are superimposed on the long-term coastal evolution. Coastal behavior also has a spatial dimension: the long-shore currents may permanently remove sediment from the shore, but they also may bring new sediments from elsewhere. Therefore, it is important to describe these processes in relation to the concept of the coastal cell.[8]

Delaware has two Coastal Zones: one as defined by the Delaware Coastal Zone Act and one defined by the Federal Coastal Zone Management Act. As defined by the State Coastal Zone Act, the Coastal Zone is a strip of coastal land, generally to the east of Route 9 and bordering the C&D Canal and Inland Bays. Under the Federal Coastal Zone Management Act, the Coastal Zone is the entire State of Delaware. Construction or expansion of industrial and manufacturing facilities is regulated within the State Coastal Zone

Prioritization and Rationale of the Erosion Hazard

Although there have been no previously recorded deaths, injuries, and quantifiable damage from Coastal erosion in Sussex County, there have been events along coastal areas of the Delaware Bay, and Atlantic Ocean coastline. This threat was judged by the HMSC and the HMWG to be of significant danger to the future of the community and thus included as an identified hazard. However, there has been no measurable property loss data to generate a CPRI rating for erosion. Thus erosion remains unranked as show in ***Table 3-33*** below.

Table 3-33: CPRI for Degree of Risk for Coastal Erosion in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
0 x .45	+	0 x .30	+	0 x .15	+	0 x .10	=	0

Erosion

There are two types of soil erosion: wind erosion and water erosion. Wind erosion can cause significant soil loss. Winds blowing across sparsely vegetated or disturbed land can pick up soil particles and carry them through the air, thus displacing them. Water erosion can occur over land or in streams and channels. Water erosion that takes place over land may result from raindrops, shallow sheets of water flowing off the land, or shallow surface flow, which is concentrated in low spots. Stream channel erosion may occur as the volume and velocity of water flow increases enough to cause movement of the streambed and bank soils. Major storms such as hurricanes may cause significant erosion by combining high winds with heavy surf and storm surge to significantly impact the shoreline.

An area's potential for erosion is determined by four factors: soil characteristics, vegetative cover, topography climate or rainfall, and topography. Soils composed of a large percentage of silt and fine sand are most susceptible to erosion. As the content of these soils increases in the level of clay and organic material, the potential for erosion decreases. Well-drained and well-graded gravels and gravel sand mixtures are the least likely to erode. Coarse gravel soils are highly permeable and have a good capacity for absorption, which can prevent or delay the amount of surface runoff. Vegetative cover can be very helpful in controlling erosion by shielding the soil surface from falling rain, absorbing water from the soil, and slowing the velocity of runoff. Runoff is also affected by the topography of the area including size, shape and slope. The greater the slope length and gradient, the more potential an area has for erosion. Climate can affect the amount of runoff, especially the frequency, intensity and duration of rainfall and storms. When rainstorms are frequent, intense, or of long duration, erosion risks are high. Seasonal changes in temperature and rainfall amounts define the period of highest erosion risk of the year.

During the past 20 years, the importance of erosion control has gained the increased attention of the public. Implementation of erosion control measures consistent with sound agricultural and construction operations is needed to minimize the adverse effects associated with increasing settling out of the soil particles due to water or wind. The increase in government regulatory programs and public concern has resulted in a wide range of erosion control products, techniques, and analytical methodologies in the United States. The preferred method of erosion control in recent years has been the restoration of vegetation.

[8] Concepts & Science for Coastal Management:- http://www.conscience-eu.net/what_is_coastal_erosion_and_when_is_it_a_problem/index.htm

During the past 20 years, the importance of erosion control has gained the increased attention of the public. Implementation of erosion control measures consistent with sound agricultural and construction operations is needed to minimize the adverse effects associated with increasing settling out of the soil particles due to water or wind. The increase in government regulatory programs and public concern has resulted in a wide range of erosion control products, techniques, and analytical methodologies in the United States. The preferred method of erosion control in recent years has been the restoration of vegetation.

Prioritization and Rationale of the Erosion Hazard

Although there have been no previously recorded deaths, injuries, and quantifiable damage from erosion in Sussex County, there have been events along areas of waterway currently not utilized or owned and was judged by the HMSC and the HMWG to be of significant danger to the future of the community and thus included as an identified hazard. There has been no measurable loss data to generate a CPRI rating for erosion. Thus erosion remains unranked as show in ***Table 3-34*** below.

Table 3-34: CPRI for Degree of Risk for Erosion in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
0 x .45	+	0 x .30	+	0 x .15	+	0 x .10	=	0

Dam/Levee Failure

Dams are manmade structures that serve a variety of uses such as flood protection, power production, agricultural, water supply, and to form recreational areas. They are typically constructed of earth, rock, or concrete, and come in all shapes and sizes. Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, and other impacts that can affect lives and property. Dams can fail because water heights or flows are above the capacity the structure was designed for (including flooding), or because the structure failed in some way. Structures fail for many reasons, including lack of maintenance, erosion, seismic events, insufficient design, development or alteration of the floodplain, or improper construction. Concrete/masonry dams usually fail from loss of a section or undermining, while the primary causes of earthen dam failure are overtopping, followed by piping failure, and then foundation failure. Concrete or masonry dams tend to fail suddenly, while earthen dams usually take longer to fail.

Dam Hazard Potential Classifications

The National Inventory of Dams is the official listing of dam classifications This classification index determines the type of structure, hazard level, safety inspection requirements such as engineering assessments and inundation studies. Dam safety inspections and monitoring have become important tools in evaluating dam failure risk, ensuring proper maintenance, and prioritizing actions. The ranking of inspections is often based on a classification system

according to the potential impact a dam failure or mis-operation would have on nearby populations and property. FEMA utilizes a Hazard Potential Classification System for Dams that categorizes them as Low, Significant, or High as described in ***Table 3-35***.

Table 3-35: Dam Hazard Potential Classification System

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, Lifeline Losses
Low (L)	None Expected	Low and Generally Limited to Owner
Significant (S)	None Expected	Yes
High (H)	Probable; One or More Expected	Yes

Source: FEMA

Low Hazard Potential Dam: Any dam whose failure or mis-operation is ***unlikely to cause*** loss of human life but may cause minor economic and or environmental losses.

Significant Hazard Potential Dam: Any dam whose failure or mis-operation will cause ***possible*** loss of human life, economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.

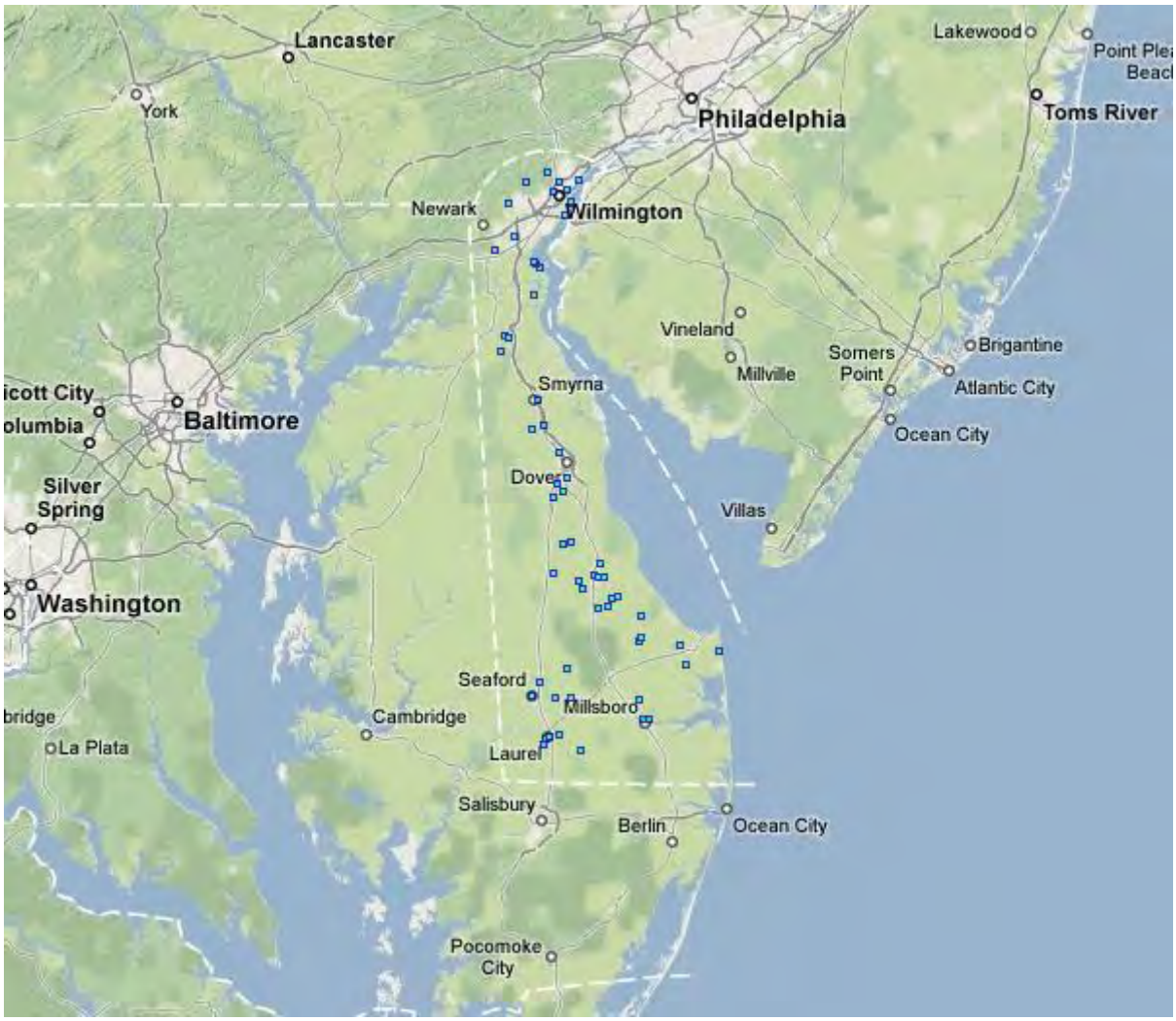
High Hazard Potential Dam: Any dam whose failure or mis-operation will cause ***probable*** loss of human life[9].

The National Inventory of Dams indicates that there are nine High Hazard risk dams within the state of Delaware. All nine are located within New Castle County. Sussex County has no NID identified High Hazard dams. The HMSC and HMWG determined that the hazard threshold for dams to be considered within this plan update would be NID identified High Hazard dams. DEMA/DNREC has expressed a concern that there are 58 high hazard dams within Sussex County as identified by the state ranking system as illustrated in **Table XX** below. **Figure XX** illustrates the NID location database.

Table XX: Delaware NID Identified Dam Statistics

State	NID Dams				State Regulated Dams			
	High Hazard	Significant Hazard	Low Hazard	Total	High Hazard	Significant Hazard	Low Hazard	Total
Delaware	9	27	1	37	58	5	0	63

Source: The National Inventory of Dams (NID) is a database



Source: The National Inventory of Dams (NID) is a database

Figure XXX: Delaware NID Dam Inventory Locations

Occurrences of the Dam Failure Hazard

Dam failure can result from natural events, human-induced events, or a combination of the two. Failures due to natural events such as hurricanes, earthquakes or landslides are significant because there is generally little or no advance warning. The most common cause of dam failure is prolonged rainfall that produces flooding. Sussex County has experienced no dam failures within the last five years. The at risk state ranked inventory within the state and County are listed in ***Table 3-36 and 3-37*** on the following page.

Table 3-36: Delaware State Dam Inventory

Delaware State Dam Inventory	
Overview	84 dams on the NID
Ownership	67 publicly owned 17 privately owned
Hazard Classification	63 high hazard potential 6 significant hazard potential 15 low hazard potential

Table 3-37: Sussex County High & Significant Potential Dam Inventory

Sussex County High & Significant Potential Dam Inventory		
High Hazard Potential	• City of Laurel Sewage Lagoon (1) • City of Laurel Sewage Lagoon (2) • City of Laurel Sewage Lagoon (3) • Selbyville Wastewater Lagoon • Clendaniel Pond Dam • Abbotts Pond Dam • Betts Pond Main Dam • Betts Pond Route 113 Dam • Burton Pond Dam • Chipman Pond Dam • Concord Pond Dam • Craigs Pond • Cubbage Pond Dam • Fleetwood Pond Dam • Griffith Lake Dam	• Hearns Pond Dam • Horseys Pond Dam • Ingram Pond Dam • Marshall Millpond Dam • Millsboro Pond Dam • Portsville Mill Pond Dam • Records Pond Dam Red • Mill Pond Dam Reynolds • Pond • Shoals Branch Dam • Swiggetts Pond Dam • Trap Pond Dam • Wagamons Pond Dam • Williams Pond Dam • Waples Pond Dam
Significant Hazard Potential	• Goslee Mill Pond Dam • Morris Millpond Dam • Collins Pond Dam • Davis Pond Dam • Trussams Pond Dam	
Low Hazard Potential	• Diamond Pond Dam • Gordons Pond Dam • Hudson Pond Dam	

Prioritization and Rationale of the Dam Failure Hazard

There have been no dam failures within Sussex County thus there are no recorded deaths, injuries, or damage. The HMSC and the HMWG find the potential impacts from dam failure to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for dam failure is shown in ***Table 3-38*** on the following page. Dam failure remains an unranked hazard.

[9] http://www.dnrec.delaware.gov/swc/Documents/SoilPPT/damsafety_files_/frame.htm

Table 3-38: CPRI for Degree of Risk for Dam Failure in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
0 x .45	+	0 x .30	+	0 x .15	+	0 x .10	=	0

Terrorism

The Federal Emergency Management Agency, in its guidance on integrating human-caused hazards into State and local hazard mitigation plans (FEMA Publication 386-7), has established a set of categories that can be applied to the profiling of intentional acts of terrorism. These categories are: contamination; energy release (i.e., explosives, arson, etc.), and disruption of a service.

Contamination, as it relates to terrorist activity, refers to the intentional release of chemical, biological or radiological agents, as well as nuclear hazards. Contamination can apply to human and animal life, a geographic area, agriculture/food supplies (as in agro-terrorism"), and even the electronic world of computers and information via the Internet and e-mail (as in "cyber terrorism.")

According to Jane's Chem-Bio Handbook, chemical agents are liquid or aerosol contaminants that can be dispersed using sprayers or other aerosol generators, by liquids vaporizing from puddles or containers, or munitions. Chemical agents may pose viable threats for hours to weeks depending on the agent used and the conditions that exist at the exposed area. This type of hazard is especially volatile because persons, vehicles, water and even the wind can carry contamination beyond the initial target zone.

Chemicals may also be corrosive or otherwise damaging *over time*, if not dealt with appropriately. Biological agents are liquid or solid contaminants that can be dispersed using sprayers or aerosol generators, or by point or line sources such as munitions, covert deposits or moving sprayers. Biological hazards may pose a danger for a period of hours to years, depending on the type of agent used and the conditions in which it exists. Contamination can be spread via water and/or wind, and infection can be spread via humans and/or animals.

FEMA's Radiological Emergency Management Course states that radiological agents can also be dispersed using sprayers or aerosol generators, or by point or line sources such as munitions, covert deposits and moving sprayers. Radiological contaminants can be hazardous for seconds and as long as years depending on the material used. The initial effects of a radiological attack are likely to be localized to the site of the attack. However, depending on meteorological conditions, the subsequent behavior of contaminants may become more dynamic. Nuclear hazards include the detonation of a nuclear device underground, on the Earth's surface, in the air, or at a high altitude. Heat flashes and blast waves resulting from a detonation would last for seconds, however nuclear radiation and fallout hazards can continue on for years. In addition, an electromagnetic pulse, resulting from a high-altitude detonation and lasting for a few seconds, can affect unprotected electronic systems. The

initial light, heat and blast effects of a subsurface, ground or airburst are static and are determined by the device's characteristics. The fallout of radioactive contaminants may be dynamic depending on meteorological conditions.

Cyber Terrorism

Cyber-terrorism is a relatively new concept. According to the National Strategy for Homeland Security, terrorists may seek to cause widespread disruption and damage, including casualties, by attacking electronic and computer networks which are linked to critical infrastructures such as energy, financial and securities networks. In addition, terrorist groups are known to exploit information technology and the Internet to plan attacks, raise funds, circulate propaganda, gather information and communicate. In terms of hazard mitigation, cyber terrorism is often explored as a component in business continuity planning.

Energy Release

Energy release refers primarily to the use of explosive devices, such as conventional bombs, and incendiary operations such as arson attacks. The detonation of an explosive device whether on or near a target has an instantaneous effect, which can be compounded and/or prolonged by the use of multiple devices. The extent of damage caused by an explosion is, of course, determined by the type and quantity of explosive used. It should be noted that explosive incidents could result in cascading effects, such as the incremental failure of a structure or system.

Arson and other incendiary attacks refer to the initiation of fire (which can be of an explosive nature) on or near a target. This type of event can last for minutes or hours, and possibly longer depending on the type and quantity of device or accelerant used and the materials (fuels) present at the location of the attack. This type of attack can also result in cascading failures of structures or systems.

Disruption of Service

Disruption of service refers to the interruption, failure or denial of a service due to terrorist attack, such as the sabotage or designed breakdown of infrastructure as with an attack on transportation facilities, utilities and other public services. While the Federal Bureau of Investigation found no evidence of terrorism or criminal activity in its investigation of the August 2003 blackout in the Northeast United States, it is clear to see the potential damage and disruption that could be caused by intentional terrorist attack on a nation's power grids.

Weapons of Mass Destruction

The term "Weapons of Mass Destruction" (WMD) has various definitions; however, common to all is the assumption that WMDs may consist of any of the agents discussed above: chemical, biological, radiological, nuclear, explosive or incendiary. The purpose of a WMD is to cause death or serious injury to persons or significant damage to property, typically assumed to be of a scale, which has the potential to overwhelm the capabilities of many local and State governments.

Prioritization and Rationale of the Terrorism Hazard

Although there have been no previously recorded deaths, injuries, or damage from terrorism in Sussex County, this hazard was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for terrorism is shown in ***Table 3-39*** below. Terrorism remains an un-ranked hazard. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

Table 3-39: CPRI for Degree of Risk for Terrorism in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
0 x .45	+	0 x .30	+	0 x .15	+	0 x .10	=	0

HazMat Incident

Hazardous materials (HazMat) incidents can apply to fixed facilities as well as mobile, transportation-related accidents in the air, by rail, on the Nation's highways and on the water. In essence, HazMat incidents consist of solid, liquid and/or gaseous contaminants that are released from fixed or mobile containers, whether by accident or by design as with an intentional terrorist attack. A HazMat incident can last hours to days, while some chemicals can be corrosive or otherwise damaging over longer periods of time. In addition to the primary release, explosions and/or fires can result from a release, and persons, vehicles, water, wind and possibly wildlife can extend contaminants beyond the initial area as well.

HazMat incidents can also occur as a result of or in tandem with natural hazard events, such as floods, hurricanes, tornadoes and earthquakes, which in addition to causing incidents, may also hinder response efforts. In the case of Hurricane Floyd in September 1999, communities along the Eastern United States were faced with flooded junkyards, disturbed cemeteries, deceased livestock, floating propane tanks, uncontrolled fertilizer spills and a variety of other environmental pollutants that caused widespread toxological concern.

According to the Pipeline and Hazardous Materials Administration, there were approximately 149 hazardous material incidents in the State since 2007. None of these incidents are reported to have an associated death or major injury associated with the incident. And only two incidents resulted in non-hospitalized injuries.

According to data from Sussex County EOC, the County responded to 11 hazardous materials incidents from 2011 through July 2016. Incidents have included release of Ammonia, Anhydrous Ammonia, Diesel Fuel and Fuel Oils, Hexamethylene Diamine, Mineral Oil and Propane Gas. There have been 11 hazardous materials events since 2011 as depicted within ***Table 3-40*** below.

Table 3-40: Hazardous Materials Incidents in Sussex County

Date	Company	Chemical	Release Amount
3/25/2011	Invista	Hexamethylene Diamine	50 gallons
8/25/2011	Shore Stop-Bethany Beach	Gasoline	7.5 gallons
5/3/2013	Mountaire-Millsboro	Anhydrous Ammonia	157 lbs
7/22/2013	Peninsula Oil Co.	Fuel Oil	6154 gallons
8/16/2013	Peninsula Oil Co.	Propane Gas	???
6/9/2014	Peninsula Oil Co.	Diesel Fuel	687 gallons
5/3/2014	Mountaire-Millsboro	Ammonia	???
6/2/2014	Delmarva Power	Mineral Oil	70 gallons
1/21/2016	Perdue-Georgetown	Ammonia	36 lbs
7/30/2016	PictSweet	Anhydrous Ammonia	100 lbs
7/28/2016	Invista	75-63-8	134 lbs

This hazard was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for terrorism is shown in ***Table 3-41*** below. Terrorism remains an un-ranked hazard.

Table 3-41: CPRI for Degree of Risk for Pipeline Failure in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
2 x .45	+	1 x .30	+	4 x .15	+	2 x .10	=	2

Pipeline Failure

The energy infrastructure of the United States is comprised of many components, including the physical network of pipes for oil and natural gas, electricity transmission lines, and other means for transporting energy to the Nation's consumers. This infrastructure also includes facilities that convert raw natural resources into energy products, as well as the rail network, trucking lines and marine transportation. (U.S. Department of Energy, 2003) Much of this infrastructure is aging, and in addition to the challenges of keeping the infrastructure up-to-date with the latest technological advances and consumer needs, the potential for an energy pipeline failure to become a hazard in-and-of-itself must be considered.

The two million miles of oil pipelines in the United States are the principal mode for transporting oil and petroleum products such as gasoline, and virtually all natural gas in the United States is moved via pipeline as well (DOE, 2003). Much of this oil pipeline infrastructure is old, requiring regular safety and environmental reviews to ensure its safety and reliability. The potential risk of pipeline accidents is a significant national concern.

The energy infrastructure is vulnerable to physical and cyber disruption, either of which could threaten its integrity and safety (DOE, 2003). Disruptions could originate with natural events

such as geomagnetic storms and earthquakes, or could result from accidents, equipment failures or deliberate interference. In addition, the Nation's transportation and power infrastructures have grown increasingly complex and interdependent; consequently, any disruption could have far-reaching consequences.

Prioritization and Rationale of the Pipeline Failure Hazard

There have been no pipeline failures within Sussex County. Although there have been no previously recorded deaths, injuries, or damage from pipeline failure in Sussex County, this hazard was judged by the HMSC and the HMWG to be of significant danger to the community and thus included as an identified hazard. The generated CPRI for pipeline failure is shown in ***Table 3-42*** below. Pipeline failure remains an un-ranked hazard. *Section 4: Risk and Vulnerability* contains detailed tables of the critical infrastructure at risk due to this type of event.

Table 3-42: CPRI for Degree of Risk for Pipeline Failure in Sussex County

Probability	+	Magnitude /Severity	+	Warning Time	+	Duration	=	CPRI
0 x .45	+	0 x .30	+	0 x .15	+	0 x .10	=	0

Hazard Prioritization

Prioritization and Rationale of the Hazard

In order to summarize the massive amounts of information and provide a level playing field for comparing hazards, analysis is performed for each hazard, and the risk to the County is evaluated based on the Calculated Priority Risk Index (CPRI). The purpose of the CPRI is not to replace scientific or local knowledge or to have the final say on a hazard, but to provide the County with a means for looking at the hazards for further vulnerability analysis. Each CPRI is accompanied by a rationale for why that particular hazard will be included or excluded.

CPRI values are based upon previous event history and hazard definitions, and combine the hazard's probability of future occurrence, magnitude or severity of the hazard's impacts, warning time before an event occurs, and the duration of the event. The categories are shown in ***Tables 3-43 through 3-46***.

Table 3-43: Probability of Future Occurrence Based on Previous Hazard Events

Probability	Index Value	Description
Highly Likely	4	• Frequent significant events with a well documented history of occurrence. • Event has up to 1 in 1 year chance of occurring. (1/1 = 100%) • History of events is 33%-100% likely per year.

Likely	3	• Occasional significant occurrences with at least two or more documented historic significant events. • Event has up to 1 in 3 year's chance of occurring. (1/3 = 33%) • History of events is 20%-33% likely per year.
Possibly	2	• Rare significant occurrences with at least one documented or anecdotal historic significant event • Event has up to 1 in 5 year's chance of occurring. (1/5=20%) • History of events is 10%-20% likely per year.
Unlikely	1	• Extremely rare with no documented history of significant events occurring. • Event has up to 1 in 10 year's chance of occurring. (1/10=10%) • History of events is 0%-10% likely per year.

Table 3-44: Magnitude/Severity of Potential Impacts Based on Previous Hazard Events

Magnitude/Severity	Index Value	Description
Catastrophic	4	• Multiple deaths • More than 50% of property is severely damaged • Complete shutdown of facilities for more than 1 month
Critical	3	• Injuries and/or illnesses result in permanent disability • More than 25% of property is severely damaged • Complete shutdown of critical facilities for at least 14 days
Limited	2	• Injuries and/or illnesses do no result in permanent disability • More than 10% of property is severely damaged • Complete shutdown of critical facilities for at least 1 day
Negligible	1	• Injuries and/or illnesses are treatable with first aid • Less than 25% of property is severely damaged • Shutdown of critical facilities for 24 hours or less

Table 3-45: Warning Time of Hazard Event Based on Hazard Definition

Warning Time	Index Value	Description
Less than 6 Hours	4	Less than 6 Hours warning time before event occurs
6-12 Hours	3	6-12 Hours warning time before event occurs
12-24 hours	2	12-24 Hours warning time before event occurs
24+ Hours	1	At least 24 Hours warning time before event occurs

Table 3-46: Duration of Hazard Event Based on Hazard Definition

Warning Time	Index Value	Description
More than 1 week	4	Event lasts more than 1 week
Less than 1 week	3	Event lasts less than 1 week
Less than 1 day	2	Event lasts less than 1 day
Less than 6 hours	1	Event lasts less than 6 hours

The HMSC and HMWG identified 14 natural and 3 manmade/technological hazards for consideration within this hazard mitigation plan update. Having applied the CPRI values in assessing the hazards, the prioritization of the hazards under consideration are displayed in ***Table 3-47***. The CPRI generated values are found following in ***Table 3-48*** on the following page.

Table 3-47: Overall Hazard Ranking

Identified Hazards to be Updated	
Flood	1
Thunderstorm	2
Hurricane Wind	2
Drought	4
Extreme Heat/Cold	5
Winter Storm	6
HazMat Incident	6
Tornado	8
Hail	9
Tsunami	10
Earthquake	Unranked
Wildfire	Unranked
Erosion	Unranked
Dam/Levee Failure	Unranked
Terrorism	Unranked
Pipeline Failure	Unranked

Table 3-48: CPRI Hazard Ranking Index

CALCULATED PRIORITY RANKING INDEX SUMMARY						
Hazard	Probability	Magnitude and/or Severity	Warning Time	Duration	CPRI Score	Hazard Ranking
Flood	1.8	.60	.30	.30	3	1
Drought	.90	.60	.15	.40	2.05	5
Winter Storm	1.35	.30	.15	.20	2	6
Thunderstorm	1.8	.60	.30	.20	2.9	2
Extreme Heat/Cold	1.35	.30	.15	.30	2.1	4
Tornado	.45	.60	.60	.10	1.75	8
Hurricane Wind	1.8	.60	.30	.20	2.9	2
Hail	.90	.30	.45	.10	1.75	9
Tsunami	.45	.30	.15	.10	1	10
Earthquake	--	--	--	--	--	Unranked
Wildfire	--	--	--	--	--	Unranked
Erosion	--	--	--	--	--	Unranked
Dam/Levee Failure	--	--	--	--	--	Unranked
Terrorism	--	--	--	--	--	Unranked
HazMat Incident	.90	.30	.60	.20	2	6
Pipeline Failure	--	--	--	--	--	Unranked

SECTION 4: Risk AND VULNERABILITY ASSESSMENT

Contents of this Section

Risk and Vulnerability Assessment

Requirement for the Risk and Vulnerability Assessment

Requirement §201.6(c)(2)(i): *The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

Requirement §201.6(c)(2)(ii): *[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.*

Requirement §201.6(c)(2)(ii)(A): *The plan* ***should*** *describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.*

Requirement §201.6(c)(2)(ii)(B): *[The plan* ***should*** *describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.*

Requirement §201.6(c)(2)(ii)(C): *[The plan* ***should*** *describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

Requirement §201.6(c)(2)(iii): *For multi-jurisdictional plans, the risk assessment* ***must*** *assess each jurisdiction's risks where they vary from the risks facing the entire planning area*.

Overview of Sussex County's Risk and Vulnerability Assessment Process

A high-level, detailed risk and vulnerability assessment was completed for Sussex County for flood (riverine and coastal), severe winds (hurricanes, coastal storms, and tornados), thunderstorms, drought, extreme weather (hot/cold), winter storms, hail, earthquakes, terrorism, hazardous materials and energy pipeline failures, due to the higher level of vulnerability for these hazards compared to others. It is important to note that this risk and vulnerability assessment is based on best available data and represents a base-level assessment for the planning area.

The loss estimates provided in this section have resulted in an *approximation* of vulnerability. These estimates should be used to understand relative vulnerability from hazards and potential losses. However, it is important to understand that uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (such as abbreviated inventories, demographics or economic parameters).

To conduct the risk and vulnerability assessment effort, two distinct hazard vulnerability assessment methodologies were applied; utilizing both HAZUS-MH (FEMA's loss estimation software) and a statistical vulnerability assessment methodology. Both

approaches provide estimates for the potential impact by using a common, systematic framework for evaluation.

The HAZUS-MH vulnerability assessment methodology is parametric, in that distinct hazard and inventory parameters (for example, wind speed and building types) were modeled using the HAZUS-MH software to determine the impact (damages and losses) on the built environment. The HAZUS-MH software was used to estimate losses from wind (hurricane and tornado), earthquake and flood hazards.

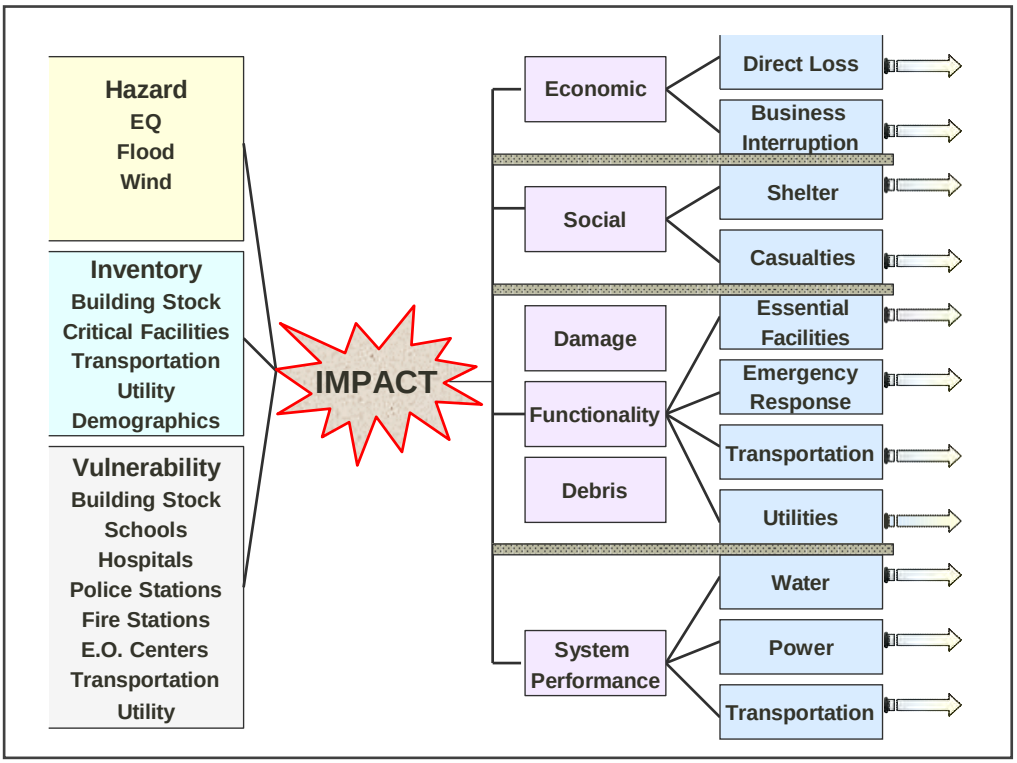
The second methodology, a statistical vulnerability assessment methodology, was applied to analyze hazards of concern that are outside the scope of the HAZUS-MH software. The methodology uses a statistical approach and mathematical modeling of vulnerability to predict a hazard's frequency of occurrence and estimated impacts based on recorded or historic damage information.

For the 2016 Plan Update, this risk and vulnerability assessment was recalculated to take advantage of improvements to the HAZUS-MH software algorithms, better and more accurate input data, and a more transparent and statistically sound loss estimation method for non-spatially specific hazards.

Explanation of HAZUS-MH Vulnerability Assessment Methodology

HAZUS-MH is FEMA's standardized loss estimation software program, built upon an integrated geographic information system (GIS) platform (**Figure 4 - 1**). This vulnerability assessment applied HAZUS-MH to produce regional profiles and estimate losses for three of the nine ranked hazards addressed in this section: flood, hurricane winds and earthquake.

Figure 4-1:Conceptual Model of HAZUS-MH Methodology



Explanation of Regional Vulnerability Assessment Methodology

Vulnerabilities associated with other natural hazards were analyzed using a regional assessment methodology developed and used specifically for this effort. This approach is based on the principal that any spatially; nonspecific hazard event is essentially a random occurrence within a region and had just as much chance of occurring within the study area as outside. Historical data for each hazard are used and statistical evaluations are performed using manual calculations. The general steps used in the statistical vulnerability assessment methodology are summarized below:

- Buffer the study area to determine the regional assessment area;
- Compile hazard occurrence data for the regional area from national and local sources;
- Categorize hazard parameters for each hazard to be modeled;
- Calculate the annualized occurrence and loss estimates for each regional subdivision;
- Normalize the annualized occurrence and loss estimates by land area and number of housing units respectively; and
- Determine the overall regional average of annualized occurrence and loss.

The economic loss results are presented here using two interrelated vulnerability indicators:

1. The Annualized Loss (AL), which is the estimated long-term value of losses to the general building stock in any single year in a specified geographic area (i.e., city or County).
2. The Annualized Loss Ratio (ALR), which expresses estimated annualized loss as a

fraction of the building inventory replacement value.

The estimated Annualized Loss (AL) addresses two key components of vulnerability: the probability of the hazard occurring in the study area and the consequences of the hazard, largely a function of building construction type and quality, and of the intensity of the hazard event. By annualizing estimated losses, the AL factors in historic patterns of frequent smaller events with infrequent but larger events to provide a balanced presentation of the vulnerability.

The Annualized Loss Ratio (ALR) represents the AL as a fraction of the replacement value of the local building inventory. This ratio is calculated using the following formula:

"ALR = ANNUALIZED LOSSES / TOTAL EXPOSURE AT RISK"

The annualized loss ratio gauges the relationship between average annualized loss and building replacement value. This ratio can be used as a measure of relative vulnerability between areas and, since it is normalized by replacement value, it can be directly compared across different geographic units such as metropolitan areas or counties.

It is important to note that HAZUS-MH was used to produce "worst case scenario" results. The outputs in this document are considered to be the result of a worst-case scenario event for each hazard, and it is understood that any smaller events would most likely create fewer losses than those calculated here.

Finally, in each of the loss tables for specific jurisdictions, the loss is listed as negligible. Negligible specifically means less than $5,000 in losses per jurisdiction. While not listed individually, these small losses are included in the total loss estimates.

Minor Civil Divisions (MCDs)

Many of the tables presented in the *Risk and Vulnerability Assessment* use Minor Civil Divisions (MCDs), which are a traditional way to divide counties into subdivisions[10] (**Figure 4-2**). MCDs are recognized by the U.S. Census Bureau and are a national standard by which HAZUS-MH results are prepared (due in part to the reliance of HAZUS on U.S. Census data.) Minor Civil Divisions cover the entire country and provide a standard level of geography below the County boundary.[11]

Figure 4-2: Minor Civil Divisions (U.S. Census 2000)

In the studies conducted for Sussex County towns or cities, such as Lewes and Seaford, are separated from the MCDs in jurisdiction-level analyses. This was done in order to provide a more detailed cross section of the planning area and eliminate tendencies to double-count available information.

[10] [1] The expanded definition of a Minor Civil Division according to the U.S. Census Bureau is, "the primary governmental or administrative division of a County or statistically equivalent entity in many states and statistically equivalent entities...a Minor Civil Division is created to govern or administer an area rather than a specific population."

[11] Minor Civil Divisions are typically most common in the Eastern United States, while Census County Divisions (CCDs), a similar method of dividing counties into subdivisions, are more common in the Western United States.

Overview of Sussex County's Assets and Development Trends

To better understand a community's risks, an evaluation of which assets are exposed to hazard events must be completed. The inventory of assets that should be considered includes the population, structures, and lifelines that could be impacted by hazard events. Section 3 provides brief descriptions of historical hazard impacts, the locations and extent of the hazards, and the impact on life and property due to each of the hazards. This Section will describe the County's overall inventory that could be injured, damaged, or destroyed during the occurrence of a hazard and possible future development trends. FEMA's spatial loss estimation software, HAZUS-MH, includes data for a number of inventory categories and was used as the foundation for the inventory data for this Plan. HAZUS-MH utilizes a number of data sources, including Census 2010 data, Dun & Bradstreet data, and Homeland Security Infrastructure Protection data to create the inventory database. Since this is a national inventory database, the accuracy of HAZUS-MH outputs can be improved by refining the inventory data based on local data.

Development Trends

The resident population of the State of Delaware is projected to increase from 197,145 in 2010 to approximately 247,276 by 2030 (U.S. Census Bureau and Delaware Population Consortium). Delaware's rate of population change, at 25.43 percent, ranks as the 17th largest in the Nation. The percent change in housing units in the State is estimated to have been 18.3 percent from 2000 to 2010, which ranks Delaware as 13th in the Nation. These trends demonstrate that Delaware's population is increasing, and consequently the number of residential structures and the associated exposure of residential buildings will increase as well. Assuming a multiplier of 1.00812, the total residential exposure of Sussex County could reach an estimated dollar value of nearly $22 billion by 2025. This estimate does not of course take into account many other development factors, such as available land for new residential construction.

Population and Demographics

According to Census Bureau statistics, there was a population of 49,255 in 1960 in Sussex County. This increased by 57.40% by 1970, again by 49.78% in the following decade, and by 12.77% from 1980 to 1990. According to the 2000 Census data, Sussex saw an increase from 1990 to 2000 of 10.10%, for a total population of 156,638. From 2000 to 2010, the County underwent a 25.86% growth for a population of 197,145. **Table 4-1** on the next page shows the population growth from 1990 to 2010 in individual municipalities. **Figure 4-3** on the following page shows the County population levels projected out to 2030 based on 2010 Census data.

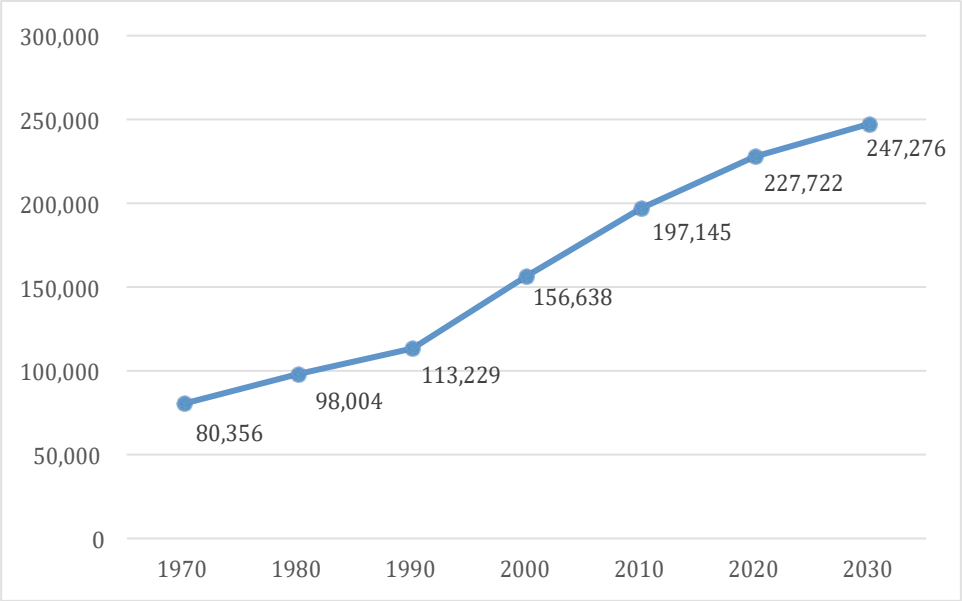
[12] Based on the percent change in housing units for a two-year period and weighted for Sussex County

Table 4-1: Population Growth from 1980 to 2000 by Municipality in Sussex County

Jurisdiction	1990 Population	2000 Population	2010 Population	% Change from 2000 to 2010
Sussex County	113,229	156,638	197,145	25.86%
Town of Bethany Beach	315	905	1,060	17.13%
Town of Bethel	157	184	171	-7.07%
Town of Blades	1079	1100	1,241	12.82%
Town of Bridgeville	1361	1546	2,048	32.47%
Town of Dagsboro	488	520	805	54.81%
Town of Delmar	1,292	1,443	1,597	10.67%
Dewey Beach	208	300	341	13.67%
Town of Ellendale	334	336	381	13.39%
Town of Fenwick Island	178	343	379	10.50%
Town of Frankford	536	716	847	18.30%
Town of Georgetown	3,983	4,789	6,422	34.10%
Town of Greenwood	587	844	973	15.28%
Town of Henlopen Acres	108	133	122	-8.27%
Town of Laurel	3,431	3,746	3,708	-1.01%
City of Lewes	2,343	2,923	2,747	-6.01%
Town of Millsboro	1,688	2,497	3,877	55.27%
Town of Millville	189	255	544	113.34%
Town of Milton	1,703	1,719	2,576	49.85%
Town of Ocean View	770	1,044	1,882	80.27%
City of Rehoboth Beach	1,335	1,500	1,327	-11.53%
City of Seaford	5,703	6,786	6,928	2.09%
Town of Selbyville	1,482	1,723	2,167	25.77%
Town of Slaughter Beach	100	198	207	4.55%
Town of South Bethany	146	493	449	-8.92%

Source: U.S. Census Bureau, 2010 Census Redistricting Data (Public Law 94-171) Summary File

Figure 4-3: Sussex County Growth



Source: U.S. Census Bureau, 2010 Census Redistricting Data (Public Law 94-171) Summary File

General Building Stock

Sussex County is the geographically largest of Delaware's three counties with 979 square miles with over 79,000 households. There are an estimated 117,721 buildings in the region with a total building replacement value (excluding contents) of $29,088,935. Approximately 95% of the County's structures and 85% of the building value are associated with residential housing. Wood frame construction makes up 81% of the building inventory, with the other 19% constructed of steel, concrete, precast, and reinforced masonry, unreinforced masonry, or manufactured housing. In HAZUS-MH analysis, the general building stock is grouped and evenly distributed at the census block or tract level.

Table 4-2: Building Exposure by Occupancy in Sussex County

Occupancy	Exposure	% of Total Building Inventory
Residential	$24,583,638	84.3%
Commercial	$2,929,442	10.1%
Industrial	$837,785	2.9%
Agricultural	$137,440	0.5%
Religious	$302,380	1.0%
Government	$131,853	0.5%
Education	$166,397	0.6%
Total	**$29,088,935**	**100.0%**

Source: HAZUS-MH Analysis completed June 2016.

Critical Facilities

For this Plan, a focus on the accuracy of the essential facilities and some of the lifeline data was a priority. The lifeline data that was updated for this Plan included potable water system facilities and wastewater treatment plants. The Delaware River Basin Commission (DRBC) shared the HAZUS-MH data that was updated based on their partnerships with certain communities, which they compiled in 2007 for the *Multi-Jurisdictional Flood Mitigation Plan for Municipalities in the Non-tidal, New Jersey Section of the Delaware River Basin*. This update did not include the entire County, only those municipalities within the designated watershed who chose to participate. Sussex County GIS Department provided data for essential facilities updates. All of the relevant data was then compiled and reloaded into HAZUS-MH for use in the analysis and loss estimations.

Table 4-3 provides the facility class codes for essential facilities and utilities that are included in **Tables 4-4** through **4-10**.

Table 4-3: Facility Class Code Definitions

Facility Class	Type of Facility	Occupancy Class	Description
EFEO	ESF: Emergency Response	Emergency Operation Centers	-
EFFS	ESF: Emergency Response	Fire Station	-
EFPS	ESF: Emergency Response	Police Station	-
EFHS	ESF: Medical Care	Small Hospital	Hospital with less than 50 beds
EFHM	ESF: Medical Care	Medium Hospital	Hospital with beds between 50-150
EFHL	ESF: Medical Care	Large Hospital	Hospital with greater than 150 beds
EFMC	ESF: Medical Care	Medical Clinic	Clinics, Labs, Blood Banks
MDFLT	ESF: Medical Care	Default for Medical	
EFS1	ESF: School	School	Primary and High School, K-12
EFS2	ESF: School	College/University	Community and State Colleges, State and Private Universities
PDFLT	Utility	Default for Potable Water	-
WDFLT	Utility	Default for Waste Water Facility	-

Source: HAZUS-MH Technical and User Manuals.

There is one Emergency Operations Center in the Sussex County essential facility inventory that was used for analysis, as listed in **Table 4-4**.

Table 4-4: Essential Facilities – Emergency Operation Centers in Sussex County

Facility Name	Jurisdiction	Facility Class
Sussex County Emergency Operations Center	Sussex County	EFEO

Source: HAZUS-MH, DRBC, and local data sources.

There are 27 fire station facilities in the Sussex County essential facility inventory that were used for analysis, as listed in **Table 4-5**.

Table 4-5: Essential Facilities – Fire Station Facilities in Sussex County

Facility Name	Jurisdiction	Facility Class
Bethany Beach Fire Sta. 70 Station 1	Bethany Beach	EFFS
Bethany Beach Fire Sta. 70 Station 2	Fenwick Island	EFFS
Bethany Beach Police Department	Bethany Beach	EFFS
Blades Volunteer Fire Sta. 71	Blades	EFFS
Bridgeville Volunteer Fire Sta. 72	Bridgeville	EFFS
Carlisle Fire Co. Station 42	Milford	EFFS
Dagsboro Fire Sta. 73	Dagsboro	EFFS
Delmar Fire Sta. 74	Delmar	EFFS
Ellendale Volunteer Fire Sta. 75	Ellendale	EFFS
Frankford Volunteer Fire Sta. 76	Frankford	EFFS
Georgetown Fire Sta. 77	Georgetown	EFFS
Greenwood Volunteer Fire Sta. 78	Greenwood	EFFS
Gumboro Volunteer Fire Sta. 79	Millsboro	EFFS
Indian River Volunteer Fire Sta. 80 Station 1	Millsboro	EFFS
Indian River Volunteer Fire Sta. 80 Station 2	Millsboro	EFFS
Laurel Fire Sta. 81	Laurel	EFFS
Lewes Fire Sta. 82 Station 1	Lewes	EFFS
Lewes Fire Sta. 82 Station 2	Lewes	EFFS
Lewes/Rehoboth Station 3	Lewes	EFFS
Memorial Fire Sta. 89	Slaughter Beach	EFFS
Millsboro Volunteer Fire Sta. 83	Millsboro	EFFS
Millville Volunteer Fire Sta. 84	Millville	EFFS
Milton Fire Sta. 85	Milton	EFFS
Rehoboth Beach Volunteer Fire Sta. 86 Sta. 1	Rehoboth Beach	EFFS
Rehoboth Beach Volunteer Fire Sta. 87 Sta. 2	Rehoboth Beach	EFFS
Roxana Volunteer Fire Sta. 90 HQ	Roxana	EFFS
Roxana Volunteer Fire Sta. 90 Station 2	Selbyville	EFFS
Seaford Volunteer Fire Department	Seaford	EFFS

Source: HAZUS-MH, DRBC, and local data sources.

There are 23 police station facilities in the Sussex County essential facility inventory that were used for analysis, as listed in **Table 4-6**.

Table 4-6: Essential Facilities – Police Station Facilities in Sussex County

Facility Name	Jurisdiction	Facility Class
Bethany Beach Police Department	Bethany Beach	EFPS
Blades Police Department	Blades	EFPS
Bridgeville Police Department	Bridgeville	EFPS
Dagsboro Police Department	Dagsboro	EFPS
Lewes Police Department	Lewes	EFPS
Delmar Police Department	Delmar	EFPS
Dewey Beach Police Department	Dewey Beach	EFPS
DSP Aviation Unit South	Georgetown	EFPS
DSP Troop 4	Georgetown	EFPS
DSP Troop 5	Bridgeville	EFPS
DSP Troop 7	Lewes	EFPS
Ellendale Police Department	Ellendale	EFPS
Fenwick Island Police Department	Fenwick Island	EFPS
Georgetown Police Department	Georgetown	EFPS
Greenwood Police Department	Greenwood	EFPS
Laurel Police Department	Laurel	EFPS
Millsboro Police Department	Millsboro	EFPS
Milton Police Department	Milton	EFPS
Ocean View Police Department	Ocean View	EFPS
Rehoboth Beach Police Department	Rehoboth Beach	EFPS
Seaford Police Department	Seaford	EFPS
Selbyville Police Department	Selbyville	EFPS
South Bethany Police Department	South Bethany	EFPS

Source: HAZUS-MH, DRBC, and local data sources.

There are 14 medical care facilities in the Sussex County essential facility inventory that were used for analysis, as listed in **Table 4-7**.

Table 4-7: Essential Facilities – Medical Care Facility in Sussex County

Facility Name	Jurisdiction	Facility Class
Bayhealth- Milford Memorial Hospital	Milford	EFHL
Beebe Medical Center	Lewes	EFMC
Nanticoke Memorial Hospital	Seaford	EFHM
Bayview Endoscopy Center, LLC	Lewes	EFMC
Cedar Tree Surgical Center	Millsboro	EFMC
Coastal Care Pain Center	Lewes	EFMC
Delaware Eye Surgery Center	Rehoboth Beach	EFMC
Seaside Endoscopy Pavilion	Lewes	EFMC
FMC Dialysis Services of Milford, INC.	Milford	EFMC

Facility Name	Jurisdiction	Facility Class
FMC Dialysis Services of Rehoboth, INC.	Rehoboth Beach	EFMC
FMC Dialysis Services of Seaford, INC.	Seaford	EFMC
Mid Sussex	Georgetown	EFMC
Liberty Seaford	Seaford	EFMC
Delaware Eye Institute	Rehoboth Beach	EFMC

Source: HAZUS-MH, DRBC, and local data sources.

There are 56 school facilities in the Sussex County essential facility inventory that were used for analysis, as listed in **Table 4-8**.

Table 4-8: Essential Facilities – School Facilities in Sussex County

Facility Name	School District	Facility Class
Beacon Middle School	Cape Henlopen School District	EFS1
Cape Henlopen High School	Cape Henlopen School District	EFS1
H. O. Brittingham Elementary School	Cape Henlopen School District	EFS1
Mariner Middle School	Cape Henlopen School District	EFS1
Milton Elementary School	Cape Henlopen School District	EFS1
Rehoboth Elementary School	Cape Henlopen School District	EFS1
Richard A. Shields Elementary School	Cape Henlopen School District	EFS1
Sussex Consortium	Cape Henlopen School District	EFS1
Delmar Middle School	Delmar School District	EFS1
Delmar Senior High School	Delmar School District	EFS1
East Millsboro Elementary School	Indian River School District	EFS1
Georgetown Elementary School	Indian River School District	EFS1
Georgetown Middle School	Indian River School District	EFS1
G. W. Carver Center	Indian River School District	EFS1
Howard T. Ennis School	Indian River School District	EFS1
Indian River High School	Indian River School District	EFS1
John M. Clayton Elementary School	Indian River School District	EFS1
Kindergarten Center	Indian River School District	EFS1
Long Neck Elementary School	Indian River School District	EFS1
Lord Baltimore Elementary School	Indian River School District	EFS1
Millsboro Middle School	Indian River School District	EFS1
North Georgetown Elementary School	Indian River School District	EFS1
Phillip C. Showell Elementary School	Indian River School District	EFS1
Selbyville Middle School	Indian River School District	EFS1
Southern Delaware School of the Arts	Indian River School District	EFS1
Sussex Central High School	Indian River School District	EFS1
Laurel Intermediate School	Laurel School District	EFS1
Laurel Middle School	Laurel School District	EFS1

Facility Name	School District	Facility Class
Laurel Senior High School	Laurel School District	EFS1
North Laurel Elementary School	Laurel School District	EFS1
Paul Laurence Dunbar Elementary School	Laurel School District	EFS1
Western Sussex Academy	Laurel School District	EFS1
Benjamin Banneker Elementary School	Milford School District	EFS1
Morris Early Childhood Center	Milford School District	EFS1
Lulu M. Ross Elementary School	Milford School District	EFS1
Milford Central Academy	Milford School District	EFS1
Milford Senior High School	Milford School District	EFS1
Mispillion Elementary School	Milford School District	EFS1
Delmarva Christian High School	Private	EFS1
Epworth Christian School	Private	EFS1
Lighthouse Christian School	Private	EFS1
Seaford Christian Academy	Private	EFS1
The Cedars Academy	Private	EFS1
The Jefferson School	Private	EFS1
Blades Elementary School	Seaford School District	EFS1
Frederick Douglass Elementary School	Seaford School District	EFS1
Seaford Central Elementary School	Seaford School District	EFS1
Seaford High School	Seaford School District	EFS1
Seaford Middle School	Seaford School District	EFS1
West Seaford Elementary	Seaford School District	EFS1
Sussex Academy	Sussex County	EFS1
Sussex Technical High School	Sussex County	EFS1
Early Childhood Education Center	Woodbridge School District	EFS1
Phillis Wheatley Elementary School	Woodbridge School District	EFS1
Woodbridge Middle School	Woodbridge School District	EFS1
Woodbridge High School	Woodbridge School District	EFS1

Source: HAZUS-MH, DRBC, and local data sources.

There are 6 potable water facilities in the Sussex County utilities inventory that were used for analysis, as listed in **Table 4-9**.

Table 4-9: Utilities – Potable Water Facilities in Sussex County

Facility Name	Jurisdiction	Facility Class
South Coastal Wastewater Treatment Plant #40	Frankford	PDFLT
Inland Bay's Treatment Facility #84	Millsboro	PDFLT
Piney Neck Treatment Facility	Dagsboro	PDFLT
South Coastal Wastewater Treatment Plant #40	Frankford	PDFLT
Sussex County Industrial Airpark Water Plant #25	Georgetown	PDFLT
Wolfeneck Treatment Facility	Rehoboth Reach	PDFLT

Source: HAZUS-MH, DRBC, and local data sources.

There are 17 waste water system facilities in the Sussex County utilities inventory that were used for analysis, as listed in **Table 4-10**.

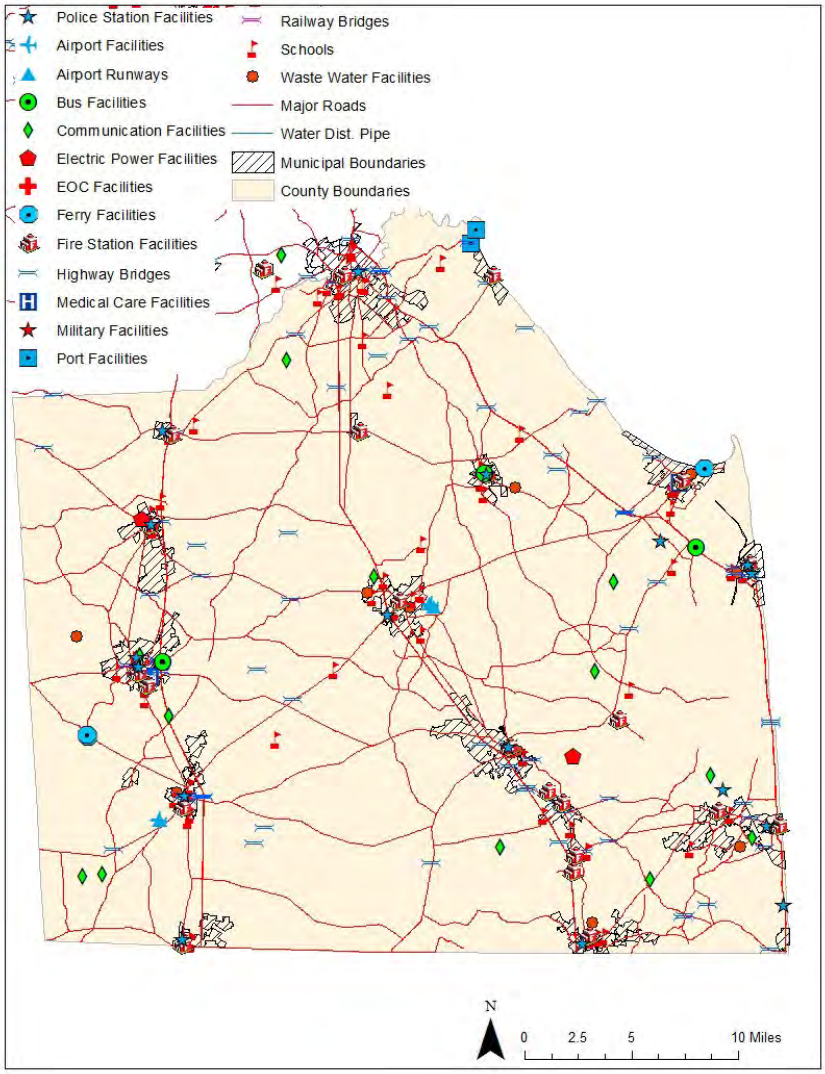
Table 4-10: Utilities – Waste Water System Facilities in Sussex County

Facility Name	Jurisdiction	Facility Class
DB-4	Dewey Beach	WDFLT
DB-5	Dewey Beach	WDFLT
DB-6		WDFLT
DF-8	Dagsboro	WDFLT
AIR-26	Georgetown	WDFLT
SC-43	Bethany Beach	WDFLT
BL-45	Blades	WDFLT
SC-67	Frankford	WDFLT
LN-82	Millsboro	WDFLT
EL-90	Ellendale	WDFLT
SC-99	Ocean View	WDFLT
SC-100	Ocean View	WDFLT
OO-189	Millsboro	WDFLT
WR-196	Lewes	WDFLT
LN-197	Millsboro	WDFLT
WR-210	Lewes	WDFLT
CN-256	Henlopen Acres	WDFLT

Source: HAZUS-MH, DRBC, and local data sources.

Figure 4-4 on the following page shows the locations of the essential facilities, potable water facilities, and waste water system facilities throughout Sussex County that were used in this analysis.

Figure 4-4: Essential Facilities, Potable Water Facilities, and Waste Water System Facilities in Sussex County



Source: HAZUS-MH, DRBC, and local data sources.

In Sussex County, the replacement value of the transportation systems is estimated to be approximately $2,052,000,000 and the utility lifeline systems to be about $398,000,000, for a total of over $2,450,000,000. This inventory includes approximately 290 kilometers of highways, 155 bridges, and 6,383 kilometers of pipes.

Summary of Risk and Vulnerability Assessment

Critical Facilities

For the purposes of this risk and vulnerability assessment, the label "critical facility" may refer to any of the following: airports, colleges, dams, day care centers, dispatch centers, electric switching stations, Emergency Operations Centers (EOCs), fire departments, food storage facilities, gas compressor stations, gas LNG plants, gate stations for utility companies, generating stations, government facilities, hospitals, hotels/motels, major bridges, medical facilities, military bases, minor bridges, newspaper offices, nursing homes, paramedic/EMS stations, police departments, ports, prisons, public shelters, radio/television towers, railroad facilities, schools, sewage treatment plants, substations and TV/radio stations.

Flood

Using FEMA DFIRM, where available, along with the modeling approach described earlier, losses were estimated using return period events ranging from 10-year to 500-year events. With this approach, annualized losses were calculated by accounting for the losses from different return period events and their respective annual probabilities of occurrence. (i.e., the annual probability of observing a 100-year flood is 1 percent).

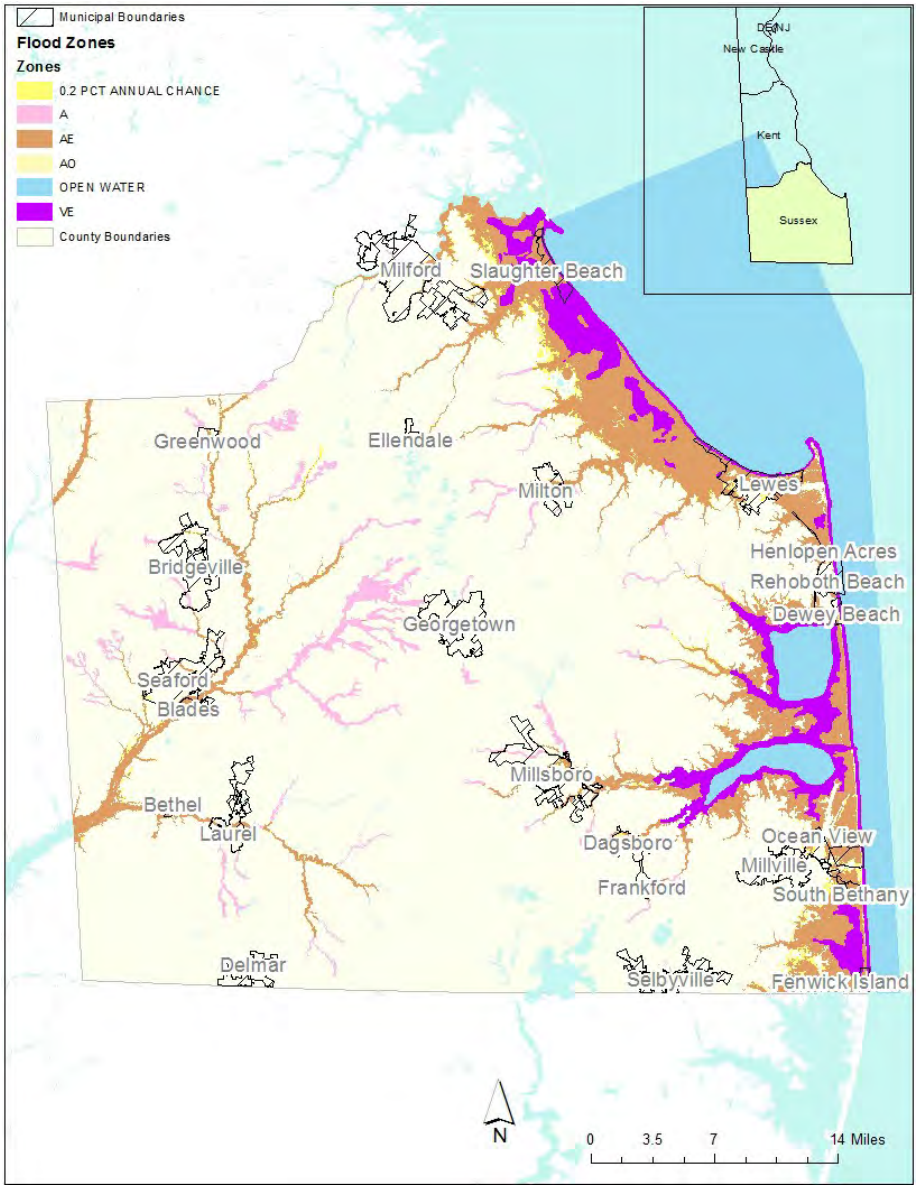
Describing vulnerability in terms of annualized losses provides three primary benefits:

1. Potential losses from all future disasters are accounted for using this approach;
2. Results across hazards are readily comparable and hence easier to rank; and
3. A risk ranking approach facilitates the evaluation of mitigation alternatives.

Coastal Flooding

Modeling conducted by the US Army Corps of Engineers in Philadelphia, PA provides an approximation of the extents of storm surge flooding by category of tropical storm. The Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model is a robust, empirically-verified storm surge model that creates maps of potential storm surge areas. Coastal flooding profiles were created for Category 1 through Category 3 storms to illustrate the expected storm surge associated with each magnitude event. In Sussex County, the risk of a Category 2 storm surge is about 1% any given year. The area of storm surge was mapped to show the intersection of surge with major cities and major roads, and can also be compared to population density/distribution. **Figure 4-5** on the following page shows the storm surge areas for Category 1 through Category 3 storm events in Sussex County.

Figure 4-5:Hurricane Storm Surge Extent (USACE)



Riverine Flooding

In addition to coastal flooding, Sussex County is vulnerable to riverine flooding, primarily due to the accumulation of excessive rainfall in the watersheds upstream along the Mispillion River, Cedar Creek, Slaughter Creek, Primehook Creek, the Broadkill River, Old Mill Creek, Love Creek, Herring Creek, Guinea Creek, the Indian River, Pepper Creek, Vines Creek, Miller Creek, Dirickson Creek, the Nanticoke River, Broad Creek, Bridgeville Branch, Gravelly Branch, Marshyhope Creek, and other smaller tributaries. A map of the 100- and 500-year floodplains can be found in **Figure 4-6.**

When taken together, the extent of potential coastal flooding and the extent of riverine flooding equal the total flood hazard zone. HAZUS-MH calculated the depth of the flood of various periodicities and compared that to the intersecting building stock exposure to predict the flood loss for each particular return period as well as an annualized estimate. **Figure 4-7** displays the result of the hydrology and hydraulic modeling in HAZUS-MH used to generate an estimate of the depth of the 100-year flood in Sussex County. **Table 4-11** shows total annualized expected losses from both coastal and riverine flooding events by jurisdiction within Sussex County. The total potential annualized losses for Sussex County equal $129,520,000.

Figure 4-6: 100-year and 500-year Floodplains

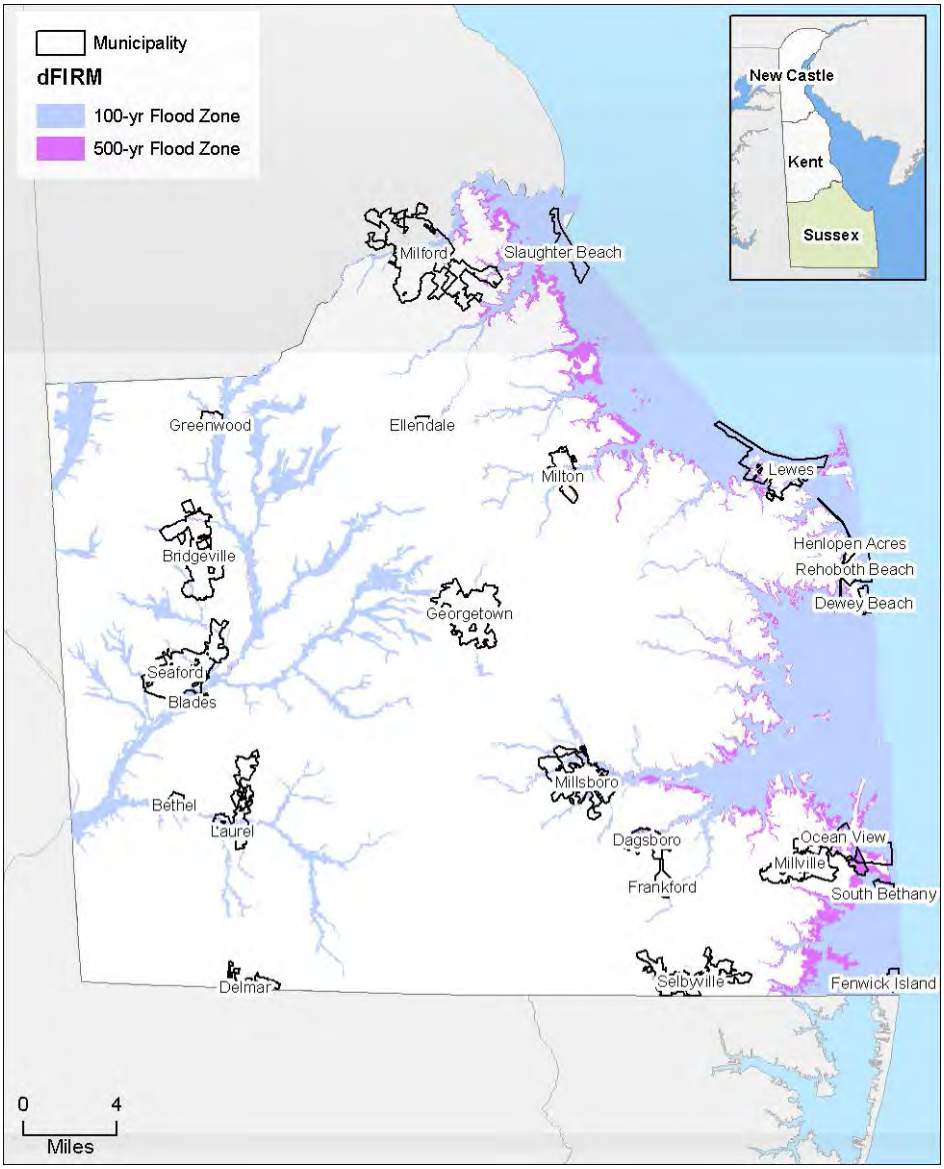


Figure 4-7: Modeled 100-year Flood Depth

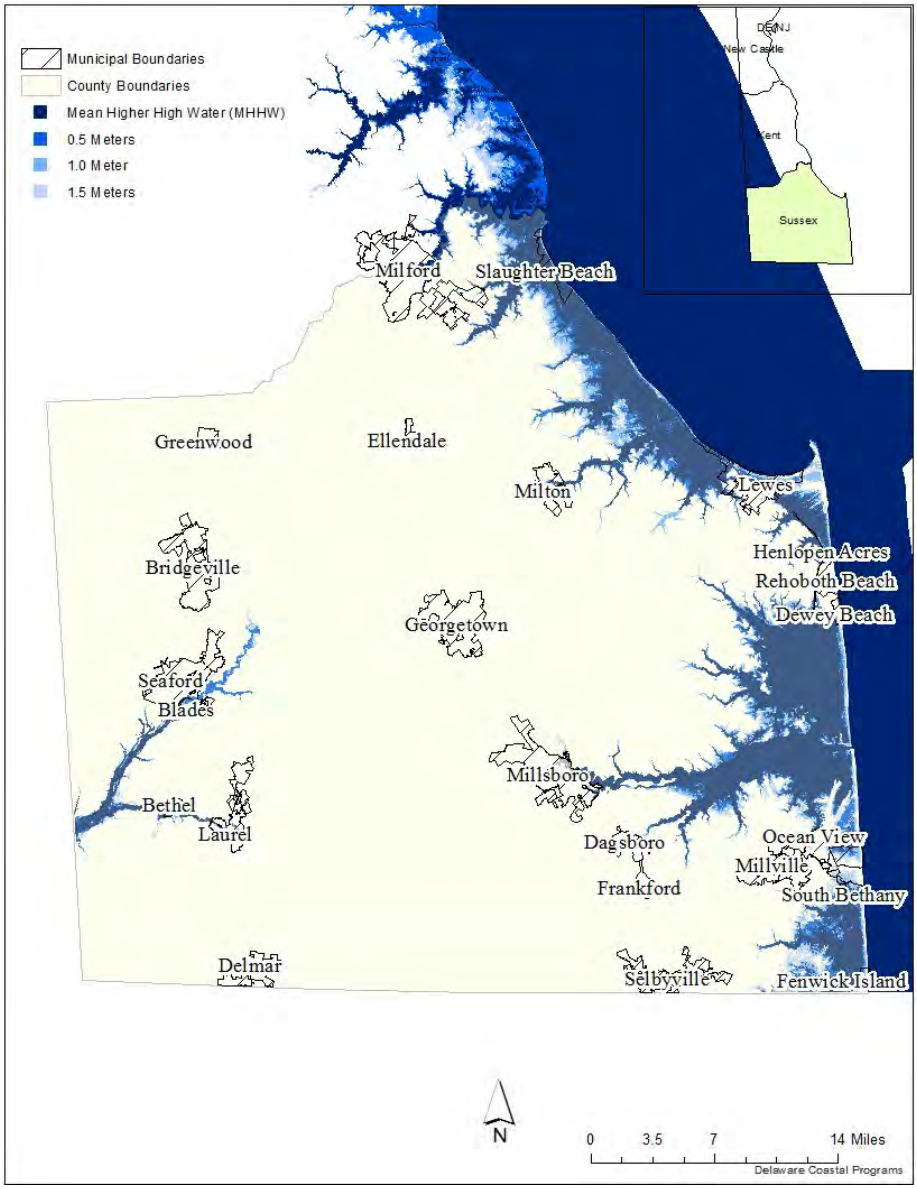


Table 4-11: Potential Annualized Losses from Flooding

Jurisdiction	Estimated Losses
Bethany Beach	$8,221,887
Bethel	$76,408
Blades	$115,000
Bridgeville	Negligible
Dagsboro	Negligible
Delmar	Negligible
Dewey Beach	$1,430,177

Jurisdiction	Estimated Losses
Ellendale	Negligible
Fenwick Island	$2,258,541
Frankford	$63,925
Georgetown	Negligible
Greenwood	$7,101
Henlopen Acres	$409,600
Laurel	$2,182,198
Lewes	$700,624
MCD Bridgeville-Greenwood	$1,091,200
MCD Georgetown	$255,801
MCD Laurel-Delmar	$991,374
MCD Lewes	$19,357,870
MCD Milford South	$1,912,048
MCD Millsboro	$36,640,370
MCD Milton	$445,316
MCD Seaford	$1,403,417
MCD Selbyville-Frankford	$43,167,201
Milford	$630,092
Millsboro	$411,348
Millville	$124,808
Milton	$338,142
Ocean View	$1,008,480
Rehoboth Beach	$499,965
Seaford	$560,861
Selbyville	$148,809
Slaughter Beach	$333,152
South Bethany	$4,017,172
TOTAL	**$129,520,000**

Another means of gauging the vulnerability within Sussex County to flooding was the vulnerability of state-owned critical facilities to the 100- and 500-year flood return periods. Within Sussex County, 1,637 critical facilities were assessed with regard to flood risk (**Table 4-12)**. In summary, in a 100-year flood event, as many as 1,561 of these facilities could sustain slight damage and 72 could sustain moderate damage. In a 500-year event, as many as 1,240 facilities could be slightly damaged and 397 could be moderately damaged. No facilities would escape with merely negligible damage (less than $5,000) in either event.

[13] The definitions used are as follows. Negligible: less than 1 percent damage. Slight: 1 to 5 percent damage. Moderate: 5 to 30 percent damage. Extensive (where applicable): 30 to 60 percent damage.

Table 4-12: Potential Damage to Critical Facilities from Flood[13]

Jurisdiction	Total Number of Critical Facilities	100-year Flood			500-year Flood		
		Moderate Damage	Slight Damage	Negligible Damage	Moderate Damage	Slight Damage	Negligible Damage
Bethany Beach	14	0	12	2	0	14	0
Bethel	1	0	1	0	0	1	0
Blades	7	0	7	0	0	7	0
Bridgeville	25	0	25	0	11	14	0
Dagsboro	11	0	11	0	0	11	0
Delmar	7	0	7	0	0	7	0
Dewey Beach	11	0	11	0	11	0	0
Ellendale	6	0	6	0	0	6	0
Fenwick Island	5	0	5	0	0	5	0
Frankford	8	0	8	0	0	8	0
Georgetown	40	0	40	0	0	40	0
Greenwood	8	0	8	0	0	8	0
Laurel	31	10	21	0	10	21	0
Lewes	40	0	39	1	0	40	0
MCD Bridgeville-Greenwood	76	12	64	0	31	45	0
MCD Georgetown	83	0	83	0	6	77	0
MCD Harrington	1	0	1	0	0	1	0
MCD Laurel-Delmar	172	17	155	0	48	124	0
MCD Lewes	175	8	166	1	30	145	0
MCD Milford North	1	0	1	0	0	1	0
MCD Milford South	121	0	121	0	19	102	0
MCD Millsboro	137	2	135	0	64	73	0
MCD Milton	62	0	62	0	10	52	0
MCD Seaford	163	19	144	0	72	91	0
MCD Selbyville-Frankford	258	4	254	0	45	213	0
Milford	33	0	33	0	0	33	0
Millsboro	14	0	14	0	0	14	0
Millville	5	0	5	0	0	5	0
Milton	20	0	20	0	6	14	0
Ocean View	6	0	6	0	0	6	0
Rehoboth Beach	33	0	33	0	1	32	0
Seaford	50	0	50	0	33	17	0

Jurisdiction	Total Number of Critical Facilities	100-year Flood			500-year Flood		
		Moderate Damage	Slight Damage	Negligible Damage	Moderate Damage	Slight Damage	Negligible Damage
Selbyville	2	0	2	0	0	2	0
Slaughter Beach	2	0	2	0	0	2	0
South Bethany	7	0	7	0	0	7	0
TOTAL	**1,637**	**72**	**1,561**	**4**	**397**	**1,240**	**0**

Repetitive Loss Properties

A repetitive loss property is an NFIP-insured property that has had at least four (4) paid flood losses of more than $1,000, or has had two (2) paid flood losses within 10 years that, in aggregate, equal or exceed the value of the property, or has had three (3) or more paid losses that, in aggregate, equal or exceed the value of the property. Addressing repetitive loss properties through the implementation of specific mitigation projects represent one of the most effective ways to reduce future flood losses. As a result, the mitigation strategies listed in the Sussex County Flood Mitigation Plan were specifically designed to address identified repetitive loss properties and are cited by reference here.[14] **Table 4-13** contains a tally of the number of repetitive loss properties in the County and individual municipalities, the number of flood insurance policies currently in force (as of July 1, 2009), and the percentage of current policies that represent repetitive loss properties. There are thirteen severe repetitive loss properties in Sussex County. A severe repetitive loss property is one that has had at least four (4) claim payments greater than $5,000, or the cumulative amount of the four (4) payments exceeds $20,000, or has had two (2) cumulative claim payments that exceed the value of the property. The location of the repetitive loss properties in relation to the DFIRM floodplain may be found in **Figure 4-8.**

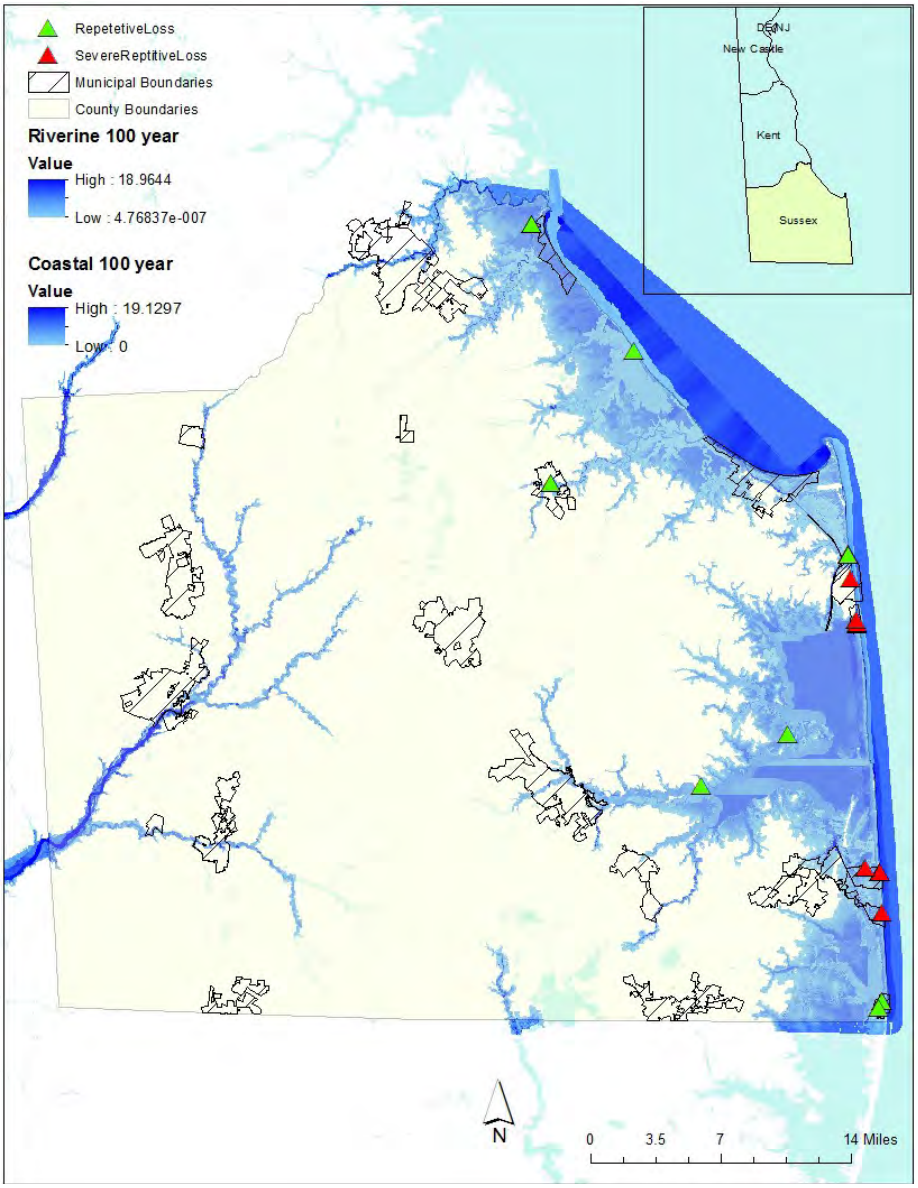
Table 4-13: Repetitive Loss Properties as of July 1, 2009 (DEMA)

Jurisdiction	Number of Rep Losses	Number of Policies	% Rep Loss
Sussex County	231	12,427	1.9%
Town of Bethany Beach	68	2,016	3.4%
Town of Dewey Beach	67	1,116	6.0%
Town of Fenwick Island	23	687	3.3%
City of Rehoboth Beach	11	1,121	1.0%
Town of South Bethany	110	896	12.3%

[14] Sussex County Flood Mitigation Plan maintained by DNREC, last updated 1999

Jurisdiction	Number of Rep Losses	Number of Policies	% Rep Loss
City of Milford	6	74	8.1%

Figure 4-8: Location of Severe Repetitive/Repetitive Loss Properties



Tropical Storm Winds

Historical evidence shows that the State of Delaware is vulnerable to hurricane and tropical storm-force winds. HAZUS-MH's modeling scenarios provided wind speed data for a range of

return periods as well as an inventory and damage functions, which were used in estimating losses. The HAZUS-MH method involves Monte Carlo simulations to estimate the probable track of a tropical storm with a particular recurrence interval, and then estimates the wind field of that probable tropical storm to predict losses.

Figures 4-9 shows the potential tropical storm winds that could affect the area for a 100-year wind event. The total potential annualized losses equal $1,926,244.

Figure 4-9: Potential Hurricane Winds for 100-year Wind Events

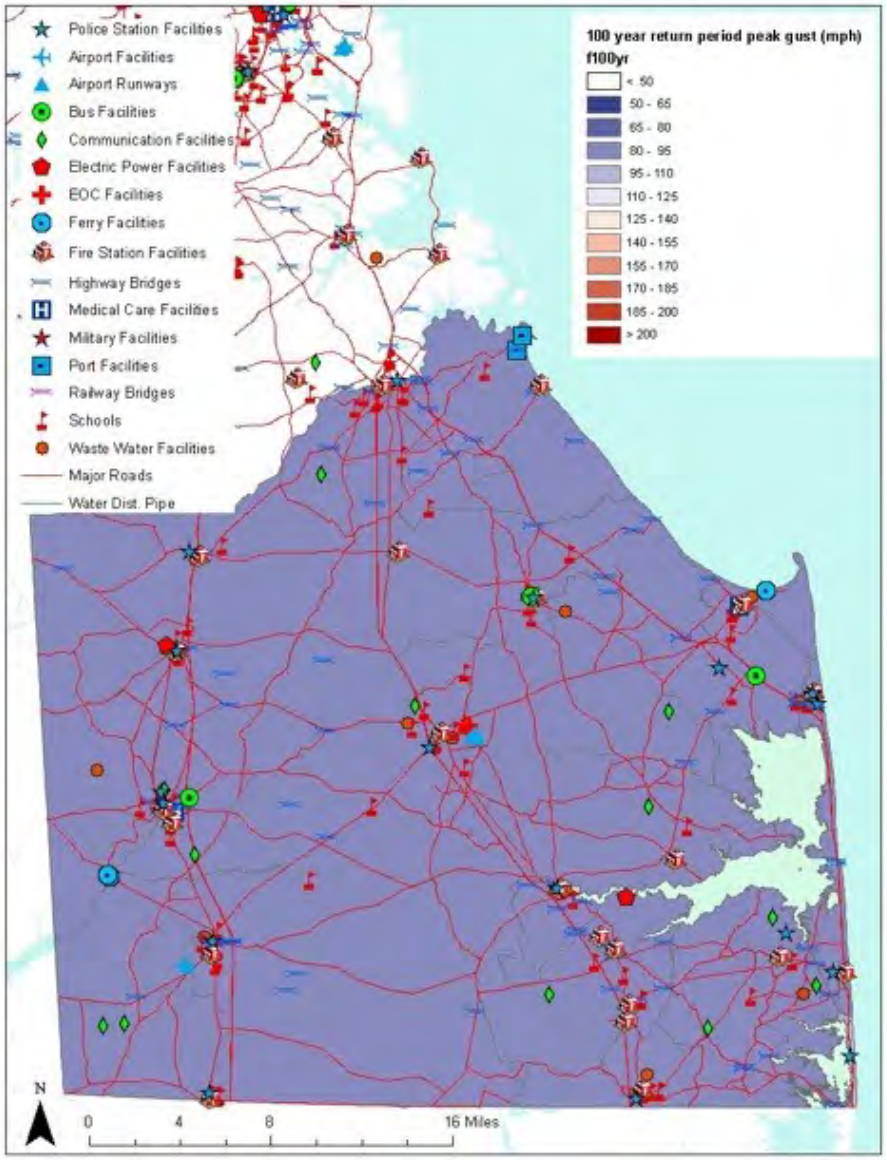


Table 4-14 shows the potential damage to critical facilities from hurricane-force wind events. **Table 4-15** shows total annualized expected losses from hurricane wind events by jurisdiction within Sussex County.

Table 4-14: Potential Damage to Critical Facilities from Tropical Storm Winds[15]

Jurisdiction	Total Number of Critical Facilities	100-year Wind			500-year Wind			
		Moderate Damage	Slight Damage	Negligible Damage	Extensive	Moderate Damage	Slight Damage	Negligible Damage
Bethany Beach	14	10	4	0	8	4	2	0
Bethel	1	1	0	0	0	0	1	0
Blades	7	4	2	1	0	2	5	0
Bridgeville	25	8	14	3	0	6	19	0
Dagsboro	11	6	5	0	2	5	4	0
Delmar	7	6	1	0	0	0	7	0
Dewey Beach	11	11	0	0	11	0	0	0
Ellendale	6	5	1	0	0	0	6	0
Fenwick Island	5	5	0	0	5	0	0	0
Frankford	8	5	3	0	1	3	4	0
Georgetown	40	34	4	2	11	4	25	0
Greenwood	8	4	2	2	0	3	5	0
Laurel	31	17	4	10	0	8	19	4
Lewes	40	30	10	0	15	8	17	0
MCD Bridgeville-Greenwood	76	30	19	27	0	40	36	0
MCD Georgetown	83	50	11	22	15	28	39	1
MCD Harrington	1	1	0	0	0	0	1	0

[15] The definitions used are as follows. Negligible: less than 1 percent damage. Slight: 1 to 5 percent damage. Moderate: 5 to 30 percent damage. Extensive (where applicable): 30 to 60 percent damage.

Jurisdiction	Total Number of Critical Facilities	100-year Wind			500-year Wind			
		Moderate Damage	Slight Damage	Negligible Damage	Extensive	Moderate Damage	Slight Damage	Negligible Damage
MCD Laurel-Delmar	172	67	46	59	2	97	70	3
MCD Lewes	175	136	36	3	127	31	14	3
MCD Milford North	1	0	0	1	0	1	0	0
MCD Milford South	121	50	24	47	11	63	41	6
MCD Millsboro	137	91	43	3	81	40	14	2
MCD Milton	62	44	14	4	43	15	3	1
MCD Seaford	163	85	36	42	0	63	96	4
MCD Selbyville-Frankford	258	180	78	0	156	70	32	0
Milford	33	22	6	5	4	8	21	0
Millsboro	14	11	3	0	5	2	7	0
Millville	5	5	0	0	5	0	0	0
Milton	20	11	7	2	3	6	9	2
Ocean View	6	2	4	0	2	4	0	0
Rehoboth Beach	33	31	2	0	27	2	4	0
Seaford	50	25	14	11	0	20	29	1
Selbyville	2	2	0	0	0	0	2	0
Slaughter Beach	2	2	0	0	1	0	1	0
South Bethany	7	4	3	0	4	3	0	0
TOTAL	**1,637**	**995**	**396**	**246**	**539**	**536**	**533**	**29**

Table 4-15: Potential Annualized Losses from Tropical Storm Winds

Jurisdiction	Estimated Losses
Bethany Beach	$11,377
Bethel	Negligible
Blades	Negligible
Bridgeville	Negligible
Dagsboro	Negligible
Delmar	Negligible

Jurisdiction	Estimated Losses
Dewey Beach	Negligible
Ellendale	Negligible
Fenwick Island	Negligible
Frankford	Negligible
Georgetown	$5,236
Greenwood	Negligible
Henlopen Acres	Negligible
Laurel	Negligible
Lewes	$7,481
MCD Bridgeville-Greenwood	$25,390
MCD Georgetown	$48,865
MCD Laurel-Delmar	$95,369
MCD Lewes	$367,759
MCD Milford South	$48,034
MCD Millsboro	$616,112
MCD Milton	$111,662
MCD Seaford	$61,270
MCD Selbyville-Frankford	$451,242
Milford	Negligible
Millsboro	$8,191
Millville	$10,358
Milton	Negligible
Ocean View	$10,134
Rehoboth Beach	$5,387
Seaford	$9,739
Selbyville	$8,370
Slaughter Beach	Negligible
South Bethany	$5,155
TOTAL	$1,926,244

Severe Thunderstorm Wind

Sussex County, according to historical records, is affected by severe thunderstorms several times a year. The strong winds and lightning generated from severe thunderstorms pose a threat to the residents, the built environment, and particularly the trees within the County. However, because severe thunderstorms are not spatially-constrained, one must consider the entire County at risk. The extent of damage from severe thunderstorm wind may be either localized or widespread but it is rarely consistent across space. Therefore, it is impossible to predict if certain areas of the County may be more vulnerable than others and even to estimate the number of buildings that may suffer loss from a severe thunderstorm wind.

The approach to determining the County's vulnerability to severe thunderstorm wind is to examine not just severe thunderstorm events in the County boundary, but to look at all of the events of the neighboring counties within 25 miles of the boundary of the County as well. A severe thunderstorm that impacts Dorchester County, MD (to the west of Sussex County) could have just as easily impacted Sussex County instead. The actual location of the severe thunderstorm at this scale of analysis is simply a matter of luck rather than any of the County's unique geographical factors. Because the neighboring jurisdictions are of differing sizes and densities, the results must be scaled appropriately. For example, Sussex County had 5.5 severe thunderstorm events per year, compared to Kent County's 4.69 events per year. But, Sussex County is bigger than Kent County; one would expect the larger County to have more thunderstorm events. Sussex County is 159% the size of Kent County. Therefore, a County the size of Kent would have been impacted by 7.46 events per year if the County had been the same size as Sussex. The annualized losses are scaled similarly, but use numbers of housing units as a proxy for differences in building exposure.

Table 4-16 shows the number of events in Sussex County and those counties within 25 miles of Sussex County. **Table 4-17** shows the number of annual events and the amount of annual loss in Sussex County and those counties within 25 miles of the County after the appropriate scale factor has been applied.

Table 4-18 shows annualized expected losses from severe thunderstorm wind events by jurisdiction within Sussex County. The total estimated annualized losses for the County equal

$168,211.

Table 4-16: Losses from Severe Thunderstorm Wind Events (NOAA)

County	Total Events	Total Loss	Years	Annual Events	Annual Loss	Deaths	Injuries
Sussex County, DE	286	$8,747,000	52	5.50	$168,211	2	10
Kent County, DE	239	$4,153,000	51	4.69	$81,431	2	5
Caroline County, MD	147	$1,426.000	53	2.77	$26,905	0	0
Dorchester County, MD	65	$10,451,000	41	1.59	$254,902	0	2
Wicomico County, MD	89	$5,255,000	51	1.75	$103,039	0	0
Worcester County, MD	59	$6,605,000	53	1.11	$124,622	0	0
Average	**147.5**	**$6,106,167**	**50.2**	**4.50**	**$126,518**	**0.67**	**2.83**

Table 4-17: Normalized Occurrences and Losses from Severe Thunderstorm Wind Events (NOAA)

County	Annual Events	Area Scale Factor	Scaled Events	Annual Loss	HU Scale Factor	Scaled Annual Loss
Sussex County, DE	5.50	1.000	5.50	$168,211	1.000	$168,211
Kent County, DE	4.69	1.590	7.46	$81,431	1.844	$150,131
Caroline County, MD	2.77	2.929	8.11	$26,905	7.624	$205,115
Dorchester County, MD	1.59	1.691	2.69	$254,902	6.340	$1,615,948
Wicomico County, MD	1.75	2.046	3.58	$103,039	2.705	$278,766
Worcester County, MD	1.11	1.981	2.20	$124,622	1.954	$243,514
Normalized Average			**4.93**			**$443,614**

Table 4-18: Potential Normalized Annualized Losses from Severe Thunderstorms by MCD and Municipality

Jurisdiction	Estimated Losses
Bethany Beach	Negligible
Bethel	Negligible
Blades	Negligible
Bridgeville	Negligible
Dagsboro	Negligible
Delmar	Negligible
Dewey Beach	Negligible
Ellendale	Negligible
Fenwick Island	Negligible
Frankford	Negligible
Georgetown	Negligible
Greenwood	Negligible
Henlopen Acres	Negligible
Laurel	Negligible
Lewes	Negligible
MCD Bridgeville-Greenwood	$17,559
MCD Georgetown	$11,452
MCD Laurel-Delmar	$30,869
MCD Lewes	$14,471
MCD Milford South	$20,936
MCD Millsboro	$16,369
MCD Milton	$10,649
MCD Seaford	$15,314

Jurisdiction	Estimated Losses
MCD Selbyville-Frankford	$21,801
Milford	Negligible
Millsboro	Negligible
Millville	Negligible
Milton	Negligible
Ocean View	Negligible
Rehoboth Beach	Negligible
Seaford	Negligible
Selbyville	Negligible
Slaughter Beach	Negligible
South Bethany	Negligible
TOTAL	**$159,420**

Tornado

Historical evidence shows that Sussex County is vulnerable to tornado activity. This particular hazard may result from severe thunderstorm activity or may occur during a tropical storm or hurricane. Because it cannot be predicted where a tornado may touchdown, all buildings and facilities are considered to be exposed to this hazard and could potentially be impacted. It is also not possible to estimate the number of residential, commercial, and other buildings or facilities that may experience losses.

The approach to determining vulnerability to tornadoes is similar to that used for severe thunderstorm wind. Historical tornado loss data from the National Oceanic and Atmospheric Administration (NOAA) was gathered for Sussex County and the neighboring counties within 25 miles of the boundary of the County. All historical losses were scaled to account for inflation, and average historic tornado losses were calculated **(Table 4-19)**. As with severe thunderstorms, the neighboring jurisdictions are of differing sizes and densities, the results must be normalized appropriately using the method described previously **(Table 4-20)**. Annualized expected losses from tornado events by jurisdiction within Sussex County are omitted as none registers more than a negligible amount. The total estimated annualized losses for the County equal $11,000.

Table 4-19: Losses from Tornado Events (NOAA)

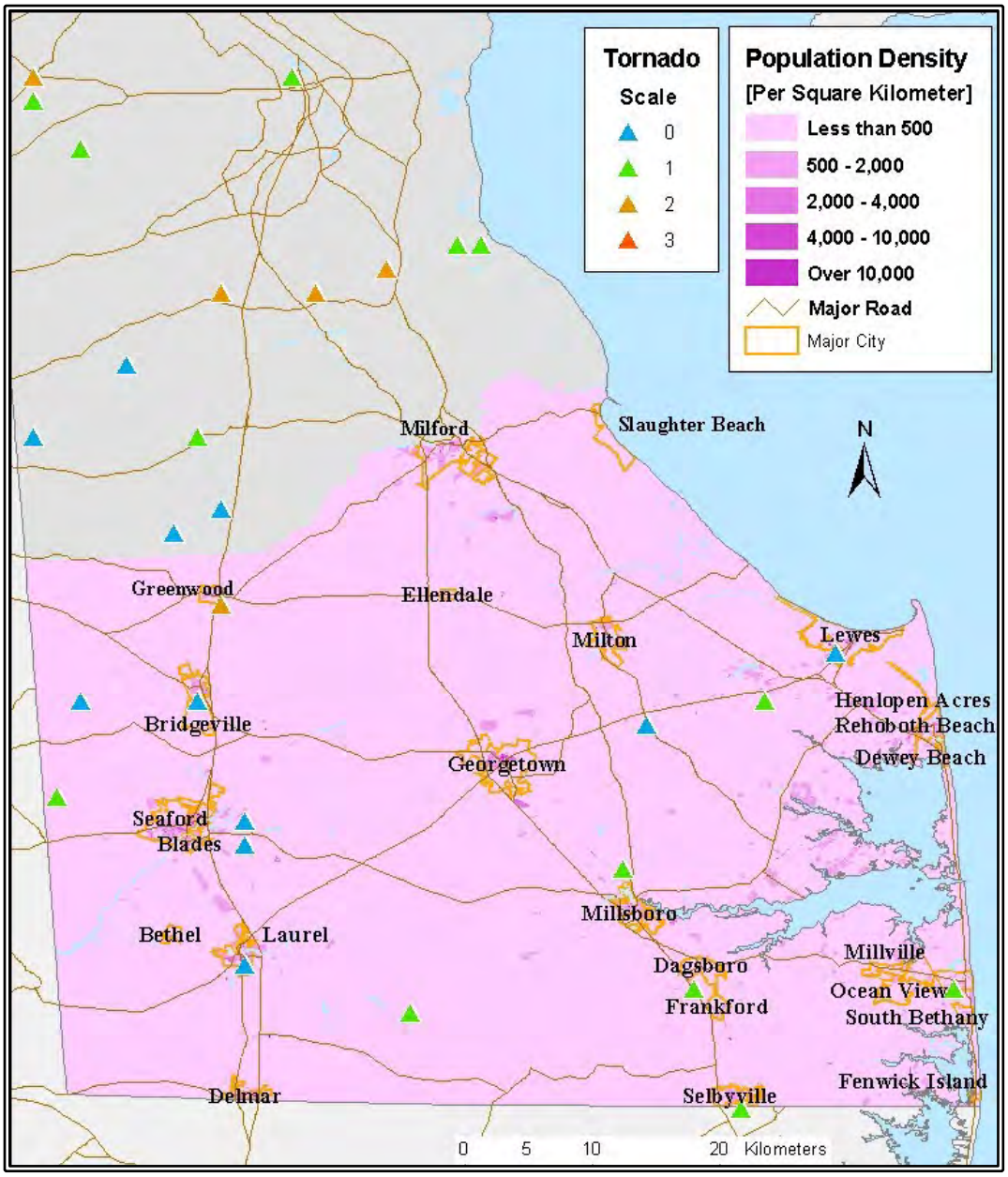
County	Total Events	Total Loss	Years	Annual Events	Annual Loss	Deaths	Injuries
Sussex County, DE	18	$594,000	54	0.33	$11,000	0	11
Kent County, DE	18	$4,908,000	45	0.40	$109,067	2	54
Caroline County, MD	6	$375,000	57	0.11	$6,579	0	0
Dorchester County, MD	11	$5,722,000	25	0.44	$228,880	1	16
Wicomico County, MD	8	$133,000	47	0.17	$2,830	0	2
Worcester County, MD	10	$250,000	51	0.20	$4,902	0	0

County	Total Events	Total Loss	Years	Annual Events	Annual Loss	Deaths	Injuries
Average	**11.8**	**$1,997,000**	**46.5**	**0.275**	**$60,543**	**0.5**	**13.8**

Table 4-20: Normalized Occurrences and Losses from Tornado Events (NOAA)

County	Annual Events	Area Scale Factor	Scaled Events	Annual Loss	HU Scale Factor	Scaled Annual Loss
Sussex County, DE	0.33	1.000	0.33	$11,000	1.000	$11,000
Kent County, DE	0.40	1.590	0.64	$109,067	1.844	$201,082
Caroline County, MD	0.11	2.929	0.31	$6,579	7.624	$50,156
Dorchester County, MD	0.44	1.691	0.74	$228,880	6.340	$1,450,982
Wicomico County, MD	0.17	2.046	0.35	$2,830	2.705	$7,656
Worcester County, MD	0.20	1.981	0.40	$4,902	1.954	$9,579
Normalized Average			**0.461**			**$288,409**

Figure 4-10 shows the location and magnitude of past tornado events in relation to population density.



Drought

Although the State of Delaware as a whole is vulnerable to drought, estimated potential losses are somewhat difficult to calculate because drought causes little damage to the built environment, mostly affecting crops and farmland. Therefore, it is assumed that all buildings and facilities are exposed to drought, but would experience negligible damage in the occurrence of a drought event.

The approach used to determine vulnerability within Sussex County consisted of a number of factors. Statistical data for the past 100 years from the University of Nebraska, developed based on Palmer Drought and Crop Severity Indices, was analyzed. Drought event frequency/impact was then determined for Sussex County. Also used was USDA agriculture data from 1997. Drought impact on the non-irrigated agriculture products profile was then determined.

Table 4-21 shows annualized expected losses from drought events by jurisdiction within Sussex County. The total estimated annualized losses for the County equal $14,659,834.

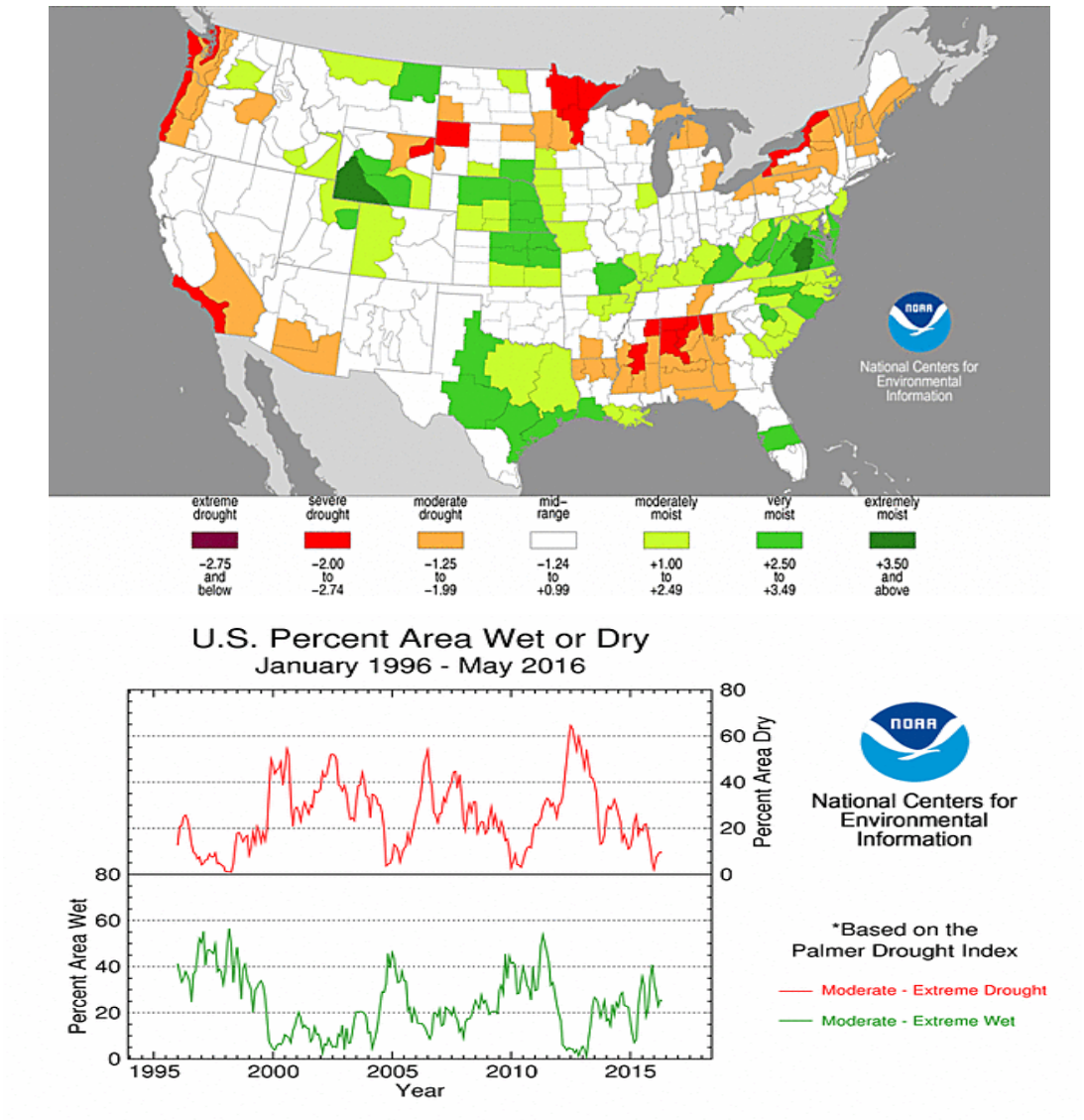
Table 4-21: Annualized Expected Losses from Drought

Jurisdiction	Estimated Losses
Bethany Beach	$17,626
Bethel	$6,671
Blades	$7,230
Bridgeville	$67,345
Dagsboro	$20,999
Delmar	$13,992
Dewey Beach	$6,732
Ellendale	Negligible
Fenwick Island	$7,536
Frankford	$10,766
Georgetown	$69,388
Greenwood	$11,048
Henlopen Acres	Negligible
Laurel	$40,473
Lewes	$65,458
MCD Bridgeville-Greenwood	$1,530,281
MCD Georgetown	$998,028
MCD Laurel-Delmar	$2,690,299
MCD Lewes	$1,261,154
MCD Milford South	$1,824,606
MCD Millsboro	$1,426,546
MCD Milton	$928,101
MCD Seaford	$1,334,655
MCD Selbyville-Frankford	$1,900,032
Milford	$142,649
Millsboro	$61,221
Millville	$35,871
Milton	$24,765
Ocean View	$37,724
Rehoboth Beach	$24,588

Jurisdiction	Estimated Losses
Seaford	$75,703
Selbyville	$50,804
Slaughter Beach	$20,816
South Bethany	$7,933
TOTAL	**$14,721,040**

Figure 4.3-10 shows the hazard profile for drought in the geographic area surrounding Sussex County.

Figure 4.3-10: Hazard Profile for Drought in and Around Sussex County (May 2016)



Hail

The State of Delaware is minimally vulnerable to hail storms. Hail does occur in the Mid-Atlantic, but is usually not large enough nor widespread enough to cause any significant damage to the built environment. It does, however, have the potential of harming crops in the agricultural areas of Sussex County.

The approach to determining vulnerability to hail is similar to that used for severe thunderstorm wind. Historical hail loss data from the National Oceanic and Atmospheric Administration (NOAA) was gathered for Sussex County and the neighboring counties within 25 miles of the boundary of the County. All historical losses were scaled to account for inflation, and average historic losses were calculated **(Table 4-22).** As with severe thunderstorms (above), because the neighboring jurisdictions are of differing sizes and densities, the results must be normalized appropriately using the method described previously **(Table 4-23).** Because the total estimated annualized losses for the County is negligible ($7,560), annualized expected losses from hail events by jurisdiction were not calculated.

Table 4-22: Losses from Hail Events (NOAA)

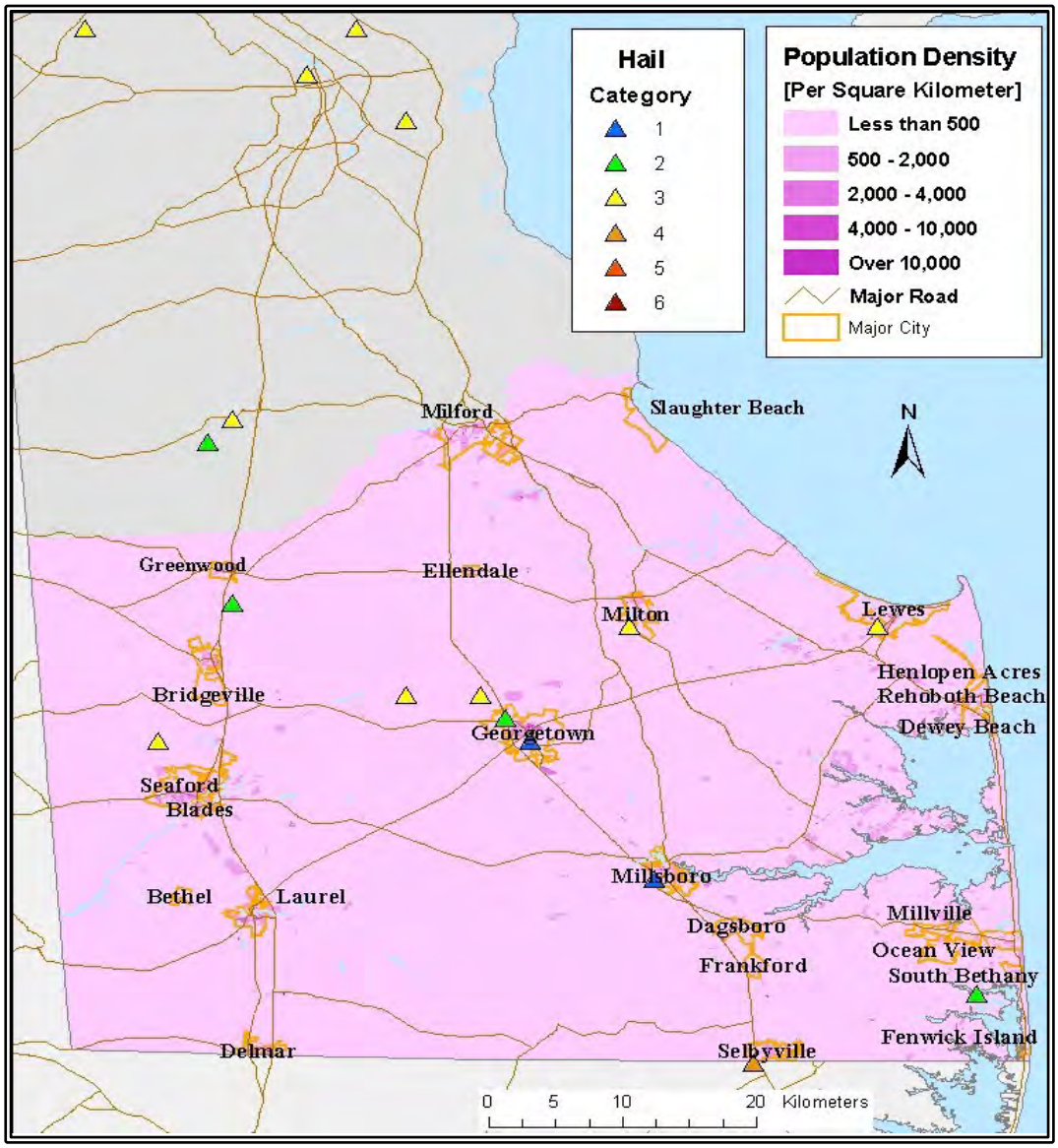
County	Total Events	Total Loss	Years	Annual Events	Annual Loss	Deaths	Injuries
Sussex County, DE	28	$310,000	41	0.68	$7,560	0	0
Kent County, DE	22	$105,000	41	0.54	$2,561	0	0
Caroline County, MD	10	$50,000	18	0.56	$2,778	0	0
Dorchester County, MD	23	$0	51	0.45	$0	0	0
Wicomico County, MD	26	$0	42	0.62	$0	0	0
Worcester County, MD	25	$3,000	51	0.49	$59	0	0
Average	**22.3**	**$78,000**	**41.0**	**0.56**	**$2,160**	**0.0**	**0.0**

Table 4-23: Normalized Occurrences and Losses from Hail Events (NOAA)

County	Annual Events	Area Scale Factor	Scaled Events	Annual Loss	HU Scale Factor	Scaled Annual Loss
Sussex County, DE	0.68	2.800	0.19	$7,560	2.800	$7,560
Kent County, DE	0.54	1.590	0.86	$2,561	1.844	$4,722
Caroline County, MD	0.56	2.929	1.64	$2,778	7.624	$21,179
Dorchester County, MD	0.45	1.691	0.76	$0	6.340	$0
Wicomico County, MD	0.62	2.046	1.27	$0	2.705	$0
Worcester County, MD	0.49	1.981	0.97	$59	1.954	$115
Normalized Average			**1.030**			**$5,596**

Figure 4-12 shows recorded hail activity by hailstone size in relation to population distribution.

Figure 4-12: Recorded Hail Activity by Hailstone Size in Relation to Population Distribution



Winter Storms

Historical evidence shows that Sussex County is quite vulnerable to winter storms, with several occurring each year. Because winter storms generally impact large areas, all buildings and facilities are exposed to this hazard and could potentially be impacted. It is also not possible to estimate the number of residential, commercial, and other buildings or facilities that may experience losses.

The approach to determining vulnerability to winter storms is similar to that used for severe thunderstorm wind. Historical winter storm loss data from the National Oceanic and Atmospheric Administration (NOAA) was gathered for Sussex County and the neighboring counties within 25 miles of the boundary of the County. All historical losses were scaled to account for inflation, and average historic losses were calculated (**Table 4-24**). As with severe thunderstorms (above), because the neighboring jurisdictions are of differing sizes and densities, the results must be normalized appropriately using the method described previously (**Table 4-25**). **Table 4-26** shows annualized expected losses from winter storm events by jurisdiction within Sussex County. The total estimated annualized losses for the County equal $340,625.[16]

Table 4-24: Losses from Winter Storm Events (NOAA)

County	Total Events	Total Loss	Years	Annual Events	Annual Loss	Deaths	Injuries
Sussex County, DE	66	$5,450,000	16	4.13	$340,625	0	65
Kent County, DE	78	$5,500,000	16	4.87	$343,750	1	60
Caroline County, MD	67	$1,400,000	16	4.19	$87,500	0	0
Dorchester County, MD	42	$5,000,000	16	2.63	$312,500	0	0
Wicomico County, MD	39	$5,000,000	16	2.44	$312,500	0	0
Worcester County, MD	37	$5,020,000	16	2.31	$313,750	0	0
Average	**54.8**	**$4,561,667**	**16.0**	**3.43**	**$285,104**	**0.2**	**20.8**

Table 4-25 Normalized Occurrences and Losses from Winter Storm Events (NOAA)

County	Annual Events	Area Scale Factor	Scaled Events	Annual Loss	HU Scale Factor	Scaled Annual Loss
Sussex County, DE	4.13	1.000	4.13	$340,625	1.000	$340,625
Kent County, DE	4.87	1.590	7.74	$343,750	1.844	$633,759
Caroline County, MD	4.19	2.929	12.27	$87,500	7.624	$677,073
Dorchester County, MD	2.63	1.691	4.45	$312,500	6.340	$1,981,089
Wicomico County, MD	2.44	2.046	4.99	$312,500	2.705	$845,451
Worcester County, MD	2.31	1.981	4.58	$313,750	1.954	$613,074
Normalized Average			**6.360**			**$846,845**

Table 4-26: Annualized Expected Losses from Winter Storms

Jurisdiction	Estimated Losses
Bethany Beach	Negligible
Bethel	Negligible
Blades	Negligible

[16] It is important to note that for winter storm, some factors that contribute to a community's actual and perceived losses are not reflected in this analysis, such as removal of snow from roadways, debris clean-up, some indirect losses from power outages, etc.

Jurisdiction	Estimated Losses
Bridgeville	Negligible
Dagsboro	Negligible
Delmar	Negligible
Dewey Beach	Negligible
Ellendale	Negligible
Fenwick Island	Negligible
Frankford	Negligible
Georgetown	Negligible
Greenwood	Negligible
Henlopen Acres	Negligible
Laurel	Negligible
Lewes	Negligible
MCD Bridgeville-Greenwood	$35,556
MCD Georgetown	$23,189
MCD Laurel-Delmar	$62,510
MCD Lewes	$29,303
MCD Milford South	$42,395
MCD Millsboro	$33,146
MCD Milton	$21,565
MCD Seaford	$31,011
MCD Selbyville-Frankford	$44,148
Milford	Negligible
Millsboro	Negligible
Millville	Negligible
Milton	Negligible
Ocean View	Negligible
Rehoboth Beach	Negligible
Seaford	Negligible
Selbyville	Negligible
Slaughter Beach	Negligible
South Bethany	Negligible
TOTAL	**$340,625**

Earthquake

Figure 4-13 shows the potential ground motion for a 100-year and 500-year earthquake. While Sussex County has felt earthquakes every so often, none have been significant enough to cause any damage for well over 100 years. The coastal plain of the Mid-Atlantic is notorious for being a seismically quiet zone. However, if a serious earthquake were to occur, the losses would likely be significant. This explains the amount of potential annualized losses for the County of

$190,778 (**Table 4-27**). **Table 4-28** shows potential damage to critical facilities from earthquake events by jurisdiction within Sussex County.

Figure 4-13: Peak Ground Acceleration (Ground Motion) for 100- and 500-Year Events

100-Year Ground Motion **500-Year Ground Motion**

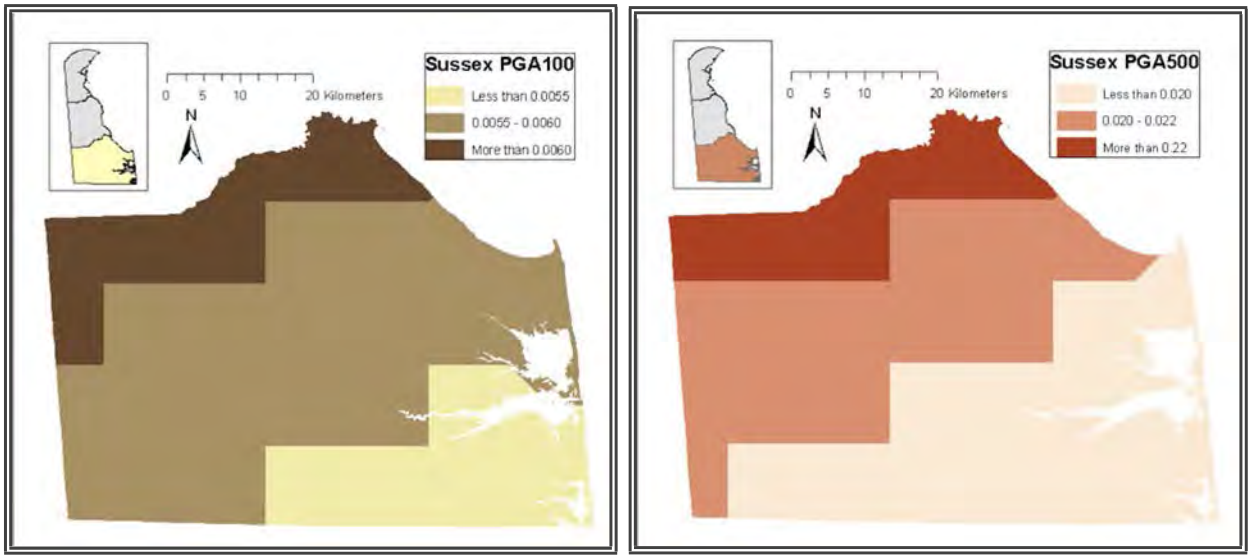


Table 4-27: Potential Annualized Losses from Earthquake

Jurisdiction	Estimated Losses
Bethany Beach	Negligible
Bethel	Negligible
Blades	Negligible
Bridgeville	Negligible
Dagsboro	Negligible
Delmar	Negligible
Dewey Beach	Negligible
Ellendale	Negligible
Fenwick Island	Negligible
Frankford	Negligible
Georgetown	Negligible
Greenwood	Negligible
Henlopen Acres	Negligible
Laurel	Negligible
Lewes	Negligible
MCD Bridgeville-Greenwood	$11,232
MCD Georgetown	$12,767
MCD Laurel-Delmar	$14,884
MCD Lewes	$40,144

Jurisdiction	Estimated Losses
MCD Milford South	$16,310
MCD Millsboro	$16,409
MCD Milton	$9,429
MCD Seaford	$21,886
MCD Selbyville-Frankford	$24,987
Milford	Negligible
Millsboro	Negligible
Millville	Negligible
Milton	Negligible
Ocean View	Negligible
Rehoboth Beach	Negligible
Seaford	$5,284
Selbyville	Negligible
Slaughter Beach	Negligible
South Bethany	Negligible
TOTAL	**$190,778**

Table 4-28: Potential Damage to Critical Facilities from Earthquake[17]

Jurisdiction	Total Number of Critical Facilities	100-year Earthquake			500-year Earthquake		
		Moderate Damage	Slight Damage	Negligible Damage	Moderate Damage	Slight Damage	Negligible Damage
Bethany Beach	14	0	0	14	0	0	14
Bethel	1	0	0	1	0	0	1
Blades	7	0	0	7	0	0	7
Bridgeville	25	0	0	25	0	0	25
Dagsboro	11	0	0	11	0	0	11
Delmar	7	0	0	7	0	0	7
Dewey Beach	11	0	0	11	0	0	11
Ellendale	6	0	0	6	0	0	6
Fenwick Island	5	0	0	5	0	0	5
Frankford	8	0	0	8	0	0	8
Georgetown	40	0	0	40	0	0	40
Greenwood	8	0	0	8	0	0	8
Laurel	31	0	0	31	0	0	31
Lewes	40	0	0	40	0	0	40
MCD Bridgeville-Greenwood	76	0	0	76	0	0	76
MCD Georgetown	83	0	0	83	0	0	83

[17] The definitions used are as follows. Negligible: less than 1 percent damage. Slight: 1 to 5 percent damage. Moderate: 5 to 30 percent damage. Extensive (where applicable): 30 to 60 percent damage

Jurisdiction	Total Number of Critical Facilities	100-year Earthquake			500-year Earthquake		
		Moderate Damage	Slight Damage	Negligible Damage	Moderate Damage	Slight Damage	Negligible Damage
MCD Harrington	1	0	0	1	0	0	1
MCD Laurel-Delmar	172	0	0	172	0	0	172
MCD Lewes	175	0	0	175	0	0	175
MCD Milford North	1	0	0	1	0	0	1
MCD Milford South	121	0	0	121	0	0	121
MCD Millsboro	137	0	0	137	0	0	137
MCD Milton	62	0	0	62	0	0	62
MCD Seaford	163	0	0	163	0	0	163
MCD Selbyville-Frankford	258	0	0	258	0	0	258
Milford	33	0	0	33	0	0	33
Millsboro	14	0	0	14	0	0	14
Millville	5	0	0	5	0	0	5
Milton	20	0	0	20	0	0	20
Ocean View	6	0	0	6	0	0	6
Rehoboth Beach	33	0	0	33	0	0	33
Seaford	50	0	0	50	0	0	50
Selbyville	2	0	0	2	0	0	2
Slaughter Beach	2	0	0	2	0	0	2
South Bethany	7	0	0	7	0	0	7
TOTAL	**1,280**	**0**	**0**	**1,280**	**0**	**0**	**1,280**

Dam/Levee Failure

The approach for determining vulnerability to dam and/or levee failure consists of a number of factors. Data from the USACE National Inventory of Dams (NID)[18] in addition to the HAZUS-MH demographic inventory was used, with an assumption that dam breaks most likely will occur at the time of maximum capacity.[19] The affected population was then calculated.

[18] With the National Dam Inspection Act of 1972, the U.S. Congress authorized the U.S. Army Corps of Engineers (USACE) to inventory dams located in the United States. The Water Resources Development Act of 1986 authorized USACE to maintain and periodically publish an updated National Inventory of Dams (NID).

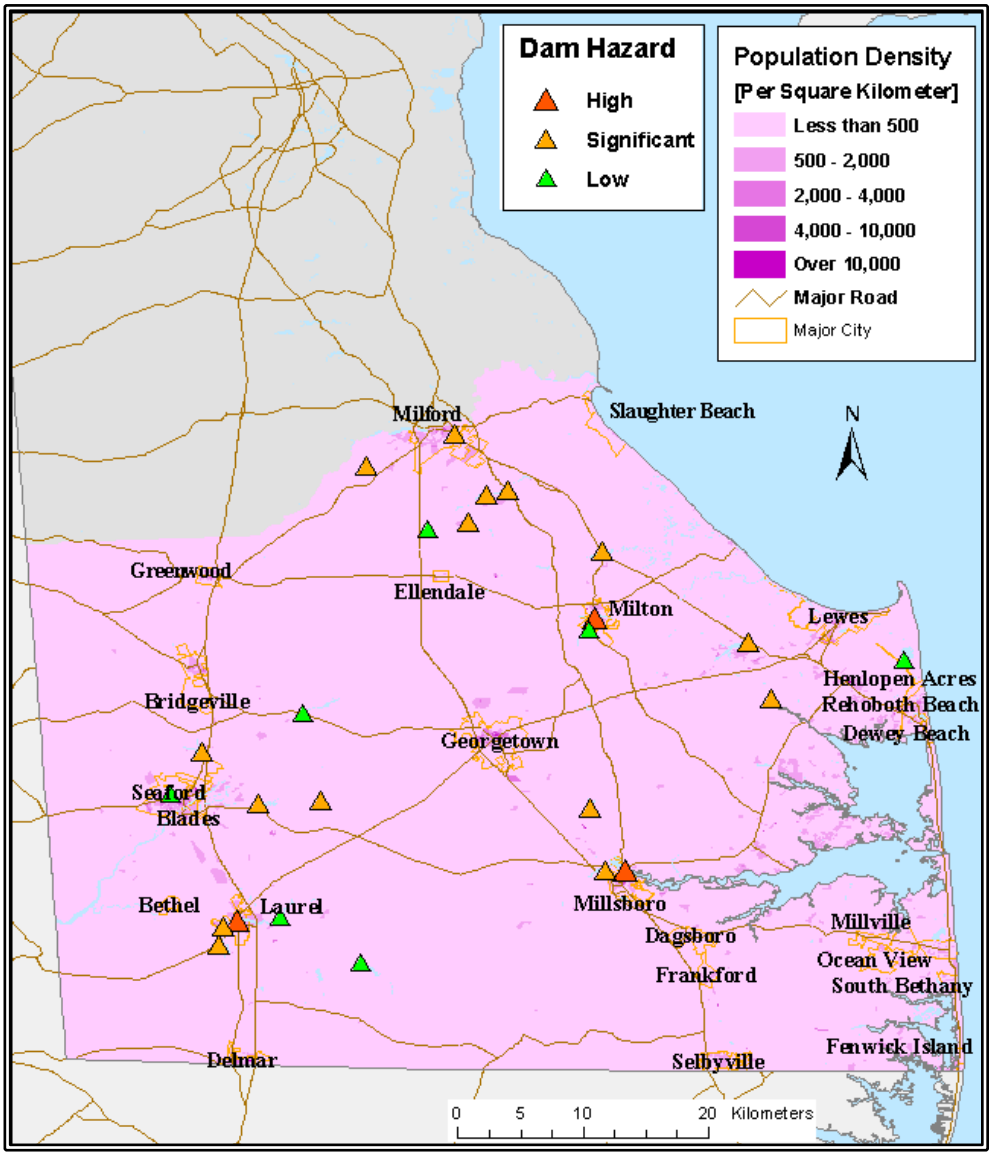
[19] Downstream quarter-circle buffer proportional to the maximum capacity of dams are assumed to represent the maximum impact area.

Table 4-29 shows estimated exposure of people to dam failure. **Figure 4-14** on the following page shows the location of dams within Sussex County, along with their hazard ranking (high, significant or low), in relation to population density.

Table 4-29: Estimated Exposure of People to Dam Failure

Dam Name	Nearest City/Town	Potential People at Risk
Williams Pond Dam	Seaford	716
Collins Pond Dam	Seaford SW	613
Hearns Pond Dam	Seaford S	549
Records Pond Dam	Laurel	466
Red Mill Pond Dam	Lewes E	346
Gordons Pond Dam	Rehoboth S	343
Horseys Pond Dam	Laurel NE	319
Wagamons Pond Dam	Milton	281
Denoname 4	Laurel	266
Denoname 3	Laurel	266
Swiggets Pond Dam	Milford NW	261
Millsboro Pond	Millsboro	229
Denoname 5	Laurel	221
Cubbage Pond Dam	Milford NW	204
Chipman Pond Dam	Laurel SW	174
Waples Pond Dam	Broadkill Beach E	149
Marshall Millpond Dam	Milford	121
Goslee Mill Pond Dam	Lewes NE	95
Trap Pond Dam	Laurel NW	83
Diamond Pond Dam	Milton NE	67
Hudson Pond Dam	Ellendale S	47

Figure 4-14: Location of Dams (With Hazard Ranking) in Relation to Population Density



Weapons of Mass Destruction

Using FEMA Publication 426 Reference Manual to Mitigate Potential Terrorist Attacks in High Occupancy Buildings as a basis, a vulnerability assessment was conducted for Weapons of Mass Destruction (WMDs) in order to expand the scope of the hazard mitigation planning process in the State of Delaware to include vulnerability to acts of terrorism. The methodology used employs a vulnerability ranking of 1 to 5 for certain transportation, water/hydrology, emergency and public safety, and utility elements. The sum total for each element is then multiplied against a value for that asset (also on a 1 to 5 scale) and multiplied against a factor representing the Department of Homeland Security Threat Level. For the purposes of this Plan, the Threat Level is assumed to be Orange (High). This part of the assessment is the same for all three counties in Delaware. In the final analysis, the total risk for each County is multiplied by a unique weighted factor to arrive at County-specific scores. For Sussex County, a weighted factor of 1.00 was used. Abbreviated findings of this methodology are presented in **Table 4-30**. Complete information is stored in a Microsoft® Excel® file separate from this Plan.

Table 4-30: Assessment of Vulnerability to Weapons of Mass Destruction

	Based on FEMA 426: Reference Manual to Mitigate Potential Terrorist Attacks in High Occupancy Buildings																
	Asset Visibility	Target Value to	Asset	Asset Mobility	Target Threat of	Collateral	Site	Pot. for Collateral	SUM		Asset Value of		Homeland		Risk		Sussex
																X	1.00
Transportation																	
Major bridges	5	4	5	5	0	2	1	0	**22**	X	**4**	X	**6**	=	**528**	:	**528**
Airports	4	4	3	5	0	1	2	0	**19**	X	**4**	X	**6**	=	**456**	:	**456**
Water / Hydrology																	
Reservoirs	3	5	3	5	1	3	1	0	**21**	X	**5**	X	**6**	=	**630**	:	**630**
Dams	4	5	2	5	1	4	1	0	**22**	X	**5**	X	**6**	=	**660**	:	**660**
Emergency and Public Safety																	
Hospitals	4	3	4	5	4	2	2	2	**26**	X	**5**	X	**6**	=	**780**	:	**780**
Military Facilities	2	4	1	5	4	3	3	2	**24**	X	**5**	X	**6**	=	**720**	:	**720**
Schools	4	4	4	5	1	1	2	1	**22**	X	**3**	X	**6**	=	**396**	:	**396**
Utilities																	
Gas LNG plant	3	3	3	5	2	3	1	2	**22**	X	**3**	X	**6**	=	**396**		**396**
Electric substations	3	2	3	5	1	2	1	0	**17**	X	**2**	X	**6**	=	**204**		**204**

To provide perspective to these findings, the final scores for each element were compared to the maximum score defined in FEMA Publication 426 "*Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings Oct 2014*" (**Table 4-31**). This comparison shows hospitals, military facilities and day care centers to have the three highest rankings compared to all other elements. These three elements are the focal point of the chemical and radiological agents sections.

Table 4-31: Comparison of Sussex County and FEMA 426 Model

Facility	Threat	Percent Comparison
Maximum Score in FEMA 426 Model	**14.400**	**100%**
Hospitals	7.800	54%
Military Facilities	7.200	50%
Day Care Centers	6.900	48%
Hazardous Material Sites	6.600	46%
Dams	6.600	46%
Reservoirs	6.300	44%
Major Bridges	5.280	37%
All Gas Pipelines	1.020	7%
U.S. Roads	0.960	7%
State Roads	0.960	7%

Chemical Agents

In planning for the possible release of a chemical agent as an act of terrorism, Sussex County identified two (2) hospitals and 47 daycare facilities throughout the County as potential targets. (**Figure 4-15**) graphically illustrates the locations of these facilities. In order to create a more complete assessment of the damage that would be inflicted should such an attack occur, Sussex County also determined the surrounding population and building stock within both an 8-mile radius of the target (the "Immediate Response Zone") and a 20-mile radius (the "Protective Action Zone"). This approach is believed to more accurately represent the overall exposure of the County and its communities to the threat of a chemical agent. **Tables 4-31** and **4-32** offer the results of this analysis. In order to keep this planning document brief, only the top three day care facilities in terms of affected population are included in **Table 4-32**. Complete information for all 47 facilities is stored in a Microsoft Excel file separate from this Plan.

Figure 4-15: Location of and Hospitals and Day Care Facilities in Sussex County

Hospitals

Day Care Facilities

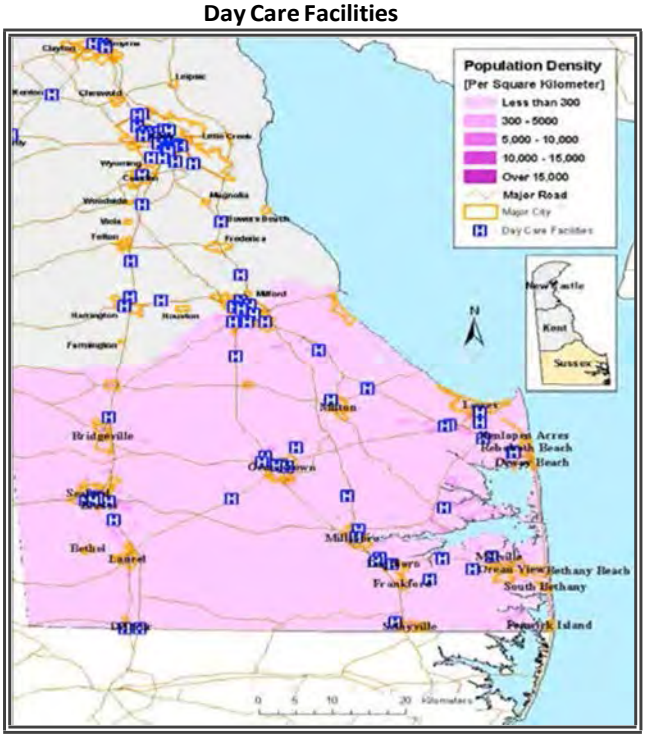


Table 4-31: Hospitals and Surrounding Exposure

Name of Hospital	City	Immediate Response Zone (IRZ) 8 miles from each hospital		Protective Action Zone (PAZ) 20 miles from each hospital	
		Population	Buildings	Population	Buildings
Beebe Medical Center	Lewes	27,779	24,313	104,072	67,839
Nanticoke Memorial Hospital	Seaford	39,178	15,727	105,689	41,312

Table 4-32: Day Care Facilities and Surrounding Exposure

Name of Day Care Facility	City	Immediate Response Zone (IRZ) 8 miles from each hospital		Protective Action Zone (PAZ) 20 miles from each hospital	
		Population	Buildings	Population	Buildings
Little Hearts Learning Center, Inc.	Dagsboro	42,170	33,212	98,415	67,841
Noah's Ark II	Millsboro	47,946	35,688	105,026	70,483
Child Craft Company	Seaford	38,877	15,611	103,191	40,292

Radiological

In planning for the possible release of a radiological agent as an act of terrorism, Sussex County identified two (2) hospitals and three (3) military facilities throughout the County as potential targets. **Figure 4-16** graphically illustrates the locations of these facilities. In order to create a more complete assessment of the damage that would be inflicted should such an attack occur, Sussex County also determined the surrounding population and building stock within both an 8-mile radius of the target the ("Immediate Response Zone") and a 20-mile radius the ("Protective Action Zone"). This approach is believed to more accurately represent the overall exposure of the County and its communities to the threat of a radiological agent. **Tables 4-33** and **4-34** contain the results of this analysis.

Figure 4-16: Location of Hospitals and Military Facilities in Sussex County

Hospitals

Military Facilities

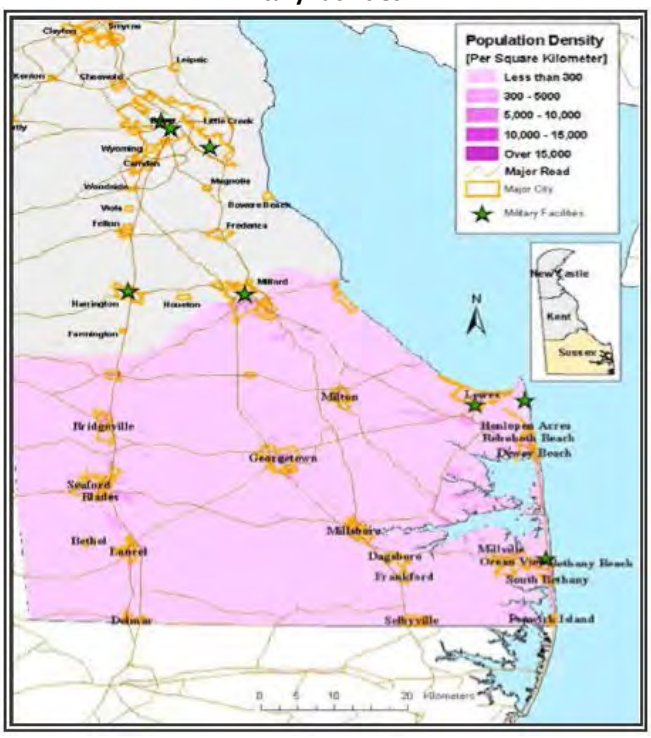


Table 4-33: Hospitals

Name of Hospital	City	Immediate Response Zone (IRZ) 8 miles from each hospital		Protective Action Zone (PAZ) 20 miles from each hospital	
		Population	Buildings	Population	Buildings
Beebe Medical Center	Lewes	37,030	29,952	289,318	142,796
Nanticoke Memorial Hospital	Seaford	43,576	17,387	289,397	142,825

Table 4-34: Military Facilities

Name of Military Facility	Immediate Response Zone (IRZ) 8 miles from each hospital		Protective Action Zone (PAZ) 20 miles from each hospital	
	Population	Buildings	Population	Buildings
U.S. Naval Reserve	29,758	26,019	287,550	142,133
Army Reserve Center	38,823	31,243	289,054	142,708
Delaware National Guard	32,588	30,818	241,475	125,650

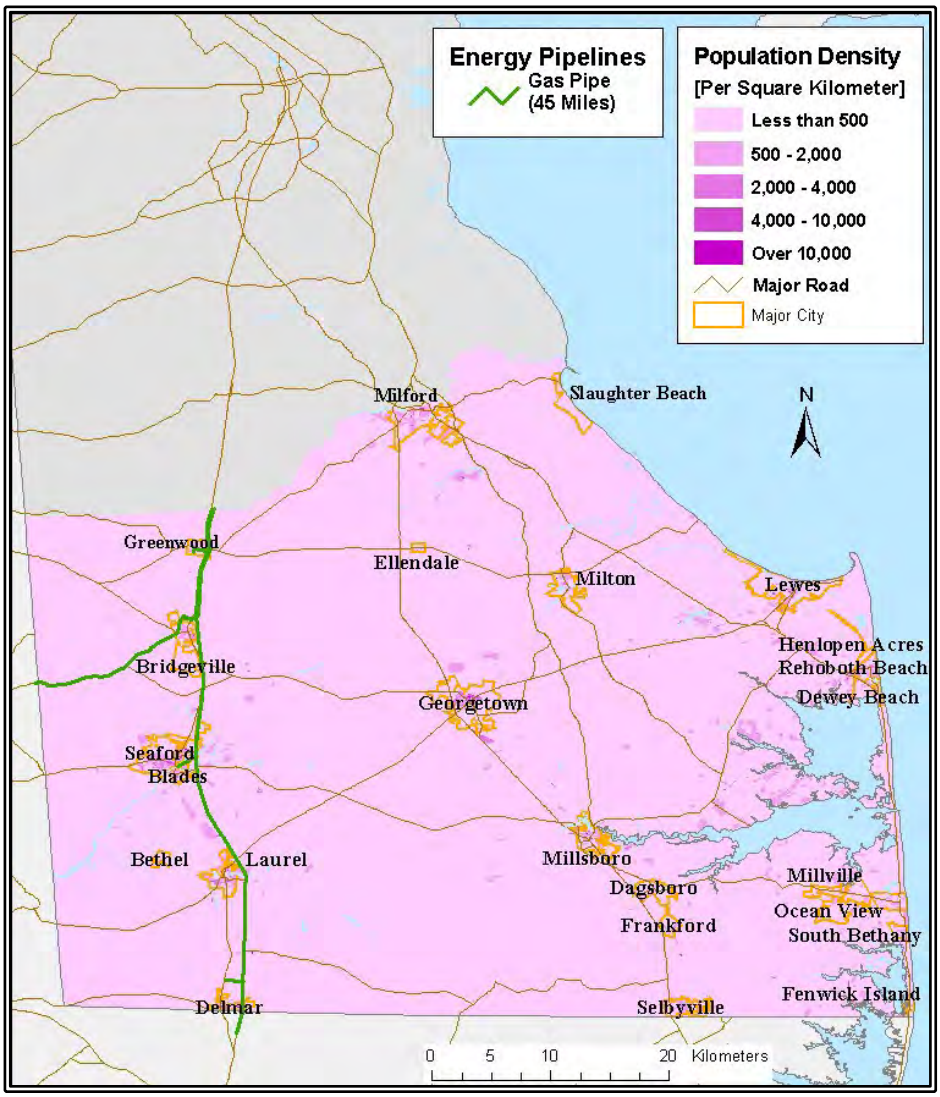
Biological Agents

The relative risk of Sussex County to Delaware in terms of the release of a biological agent is 6.28 percent. This is based on a risk formula of "VULNERABILITY x HAZARD x EXPOSURE." Vulnerability in this case is a measure of the speed at which infection will spread among the population. Population was studied based on general occupancy class: residential, commercial, industrial, education, government, agricultural and religious. The hazard component was considered to be a measure of the introduction of the disease among the population. This also was broken down by occupancy class, in this case residential, commercial, industrial, education, government and religious. The exposure was determined using HAZUS-MH data.

Energy Pipelines

Energy pipelines cross most of the State of Delaware, including some of Sussex County. If any of these energy pipelines, oil or gas, were to rupture, such an event could endanger property and lives in the immediate area, within less than half a mile radius. **Figure 4-16** on the following page shows the location of 45 miles of energy pipelines within the County's boundaries in relation to population density and municipalities.

Figure 4-16: Energy Pipelines



Hazardous Materials (HazMat)

Assessing vulnerability to a hazardous material (HazMat) release on a Countywide scale can consist of a number of factors, such as the type(s) of hazardous materials present, the potential for mass casualties, potential consequences for the surrounding area, accessibility, public awareness, and the likelihood of being a terrorist target. The assessment conducted for Sussex County focuses on the first three of these factors, and a comprehensive study was undertaken to document information for 13 identified hazardous material sites from State of Delaware exposure data.[20] High consequence events were then

[20] If a facility houses more than one hazardous material, it is treated as a separate entry in this table, partially due to the fact that potential population at risk and projected clean-up area could vary depending on the chemical.

selected, (high material toxicity and population density), and ALOHA[21]was used for calculating the impact area.

Affected population (based on Census 2010) and exposure value (HAZUS-MH) was then reported per selected events. **Table 4-35** offers the results of this analysis for all 13 HazMat facilities.

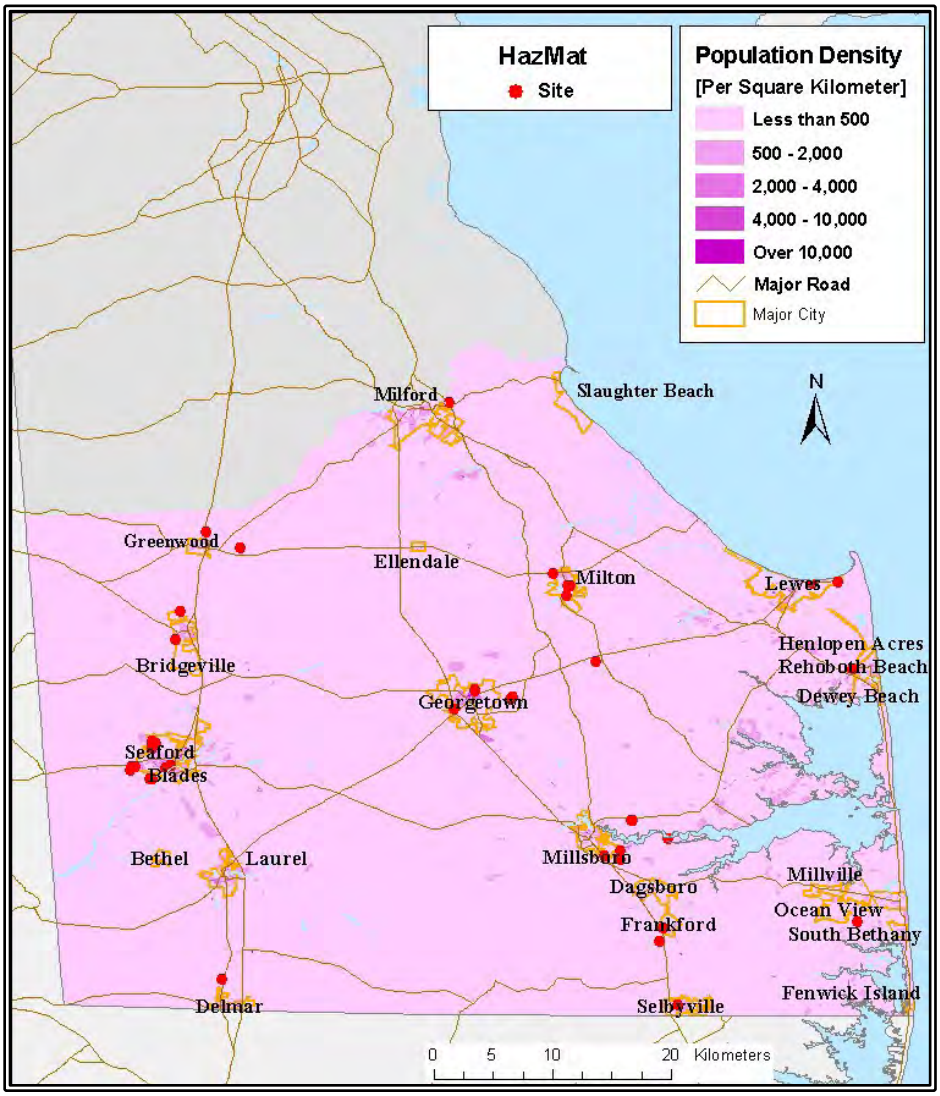
Table 4-35: Hazardous Materials Facilities

Facility Name	City	Chemical Name	Potential Residential Population at Risk	Clean-up Area (square kms)
Orient Corp. of America	Seaford	Aniline	192	3.118
Johnson Polymer *	Seaford	Butyl Acrylate	143	2.325
Orient Corp. of America	Seaford	Nitrobenzene	65	0.856
Du Pont Seaford Plant	Seaford	Antimony Compounds **Reacts with Water	19	0.447
Johnson Polymer	Seaford	Ammonia	8	0.096
Du Pont Seaford Plant	Seaford	Zinc Compounds	0	0.048
Du Pont Seaford Plant	Seaford	Hydrochloric Acid	0	0.028
Du Pont Seaford Plant	Seaford	Mercury Compounds	0	0.000
Du Pont Seaford Plant	Seaford	Sulfuric Acid	0	0.000
Du Pont Seaford Plant	Seaford	Chromium Compounds	0	0.000
Du Pont Seaford Plant	Seaford	Biphenyl	0	0.000
Du Pont Seaford Plant	Seaford	Chlorodifluoromethane	0	0.000
Exergy *(Formerly Green Tree Chemical Technologies, Inc., Aerosols Div.)*	Seaford	1,1-Dichloro-1-Fluoroethane	0	0.000

*Facility is no longer in operation.

[21] ALOHA (Areal Locations of Hazardous Atmospheres) is a computer program that uses information provided by its operator and physical property data from its extensive chemical library to predict how a hazardous gas cloud might disperse in the atmosphere after an accidental chemical release

Figure 4-17: Location of Hazardous Materials Facilities in Relation to Population Density



Other Hazards

Though communities in the State of Delaware recognize that the state is vulnerable to other hazards such as wildfires, erosion, sinkholes, landslides and tsunamis, a high-level detailed risk assessment was not completed for Sussex County due to the low level of risk and/or vulnerability for these hazards within the area as a whole as compared with other hazards.

Conclusions on Hazard Risk

Table 4-36 summarizes the annualized expected losses presented for each natural hazard in this section. Based upon the methodologies described in the beginning of this section, the risk from natural hazards in Sussex County can be rated on a scale of Low, Moderate or High for each identified natural hazard based upon these annualized losses and an annualized loss ratio (**Table 4-38**).[22] Because of the nature of human-caused hazards and the nature in which risk and vulnerability is presented for human-caused hazards, it is not possible to rank them fairly in direct comparison with natural hazards. In summary, all human-caused hazards addressed in this section; terrorism (chemical, radiological and biological agents), hazardous materials incidents (HazMat), and energy pipeline failures, warrant an overall rating of low risk for Sussex County.

In order to create a final overall risk ranking per hazard in Sussex County, the previous hazard analysis and the risk assessment are combined in **Table 4-39**. A number of analyzed hazards were deemed to be of little consequence to the County. They are added to the risk ranking as low risk but unranked. Other hazards, such as extreme heat/cold, generate no direct monetary losses and are excluded from the risk assessment. However, their frequency of occurrence and their potential to cause injuries and death warrants them to be ranked at a medium level of risk. The final risk ranking demonstrates that flooding and drought are the two most critical threats to Sussex County's population and built environment.

Table 4-36: Potential Annualized Losses per Jurisdiction

Jurisdiction	Flood	Tropical T Storm Wind	hunder-storm	Tornado	Drought	Hail	Winter Storm	Earthquake
Bethany Beach	$8,221,887	$11,377	Negligible	Negligible	$17,626	Negligible	Negligible	Negligible
Bethel	$76,408	Negligible	Negligible	Negligible	$6,671	Negligible	Negligible	Negligible
Blades	$115,000	Negligible	Negligible	Negligible	$7,230	Negligible	Negligible	Negligible
Bridgeville	Negligible	Negligible	Negligible	Negligible	$67,345	Negligible	Negligible	Negligible
Dagsboro	Negligible	Negligible	Negligible	Negligible	$20,999	Negligible	Negligible	Negligible
Delmar	Negligible	Negligible	Negligible	Negligible	$13,992	Negligible	Negligible	Negligible
Dewey Beach	$1,430,177	Negligible	Negligible	Negligible	$6,732	Negligible	Negligible	Negligible
Ellendale	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Fenwick Island	$2,258,541	Negligible	Negligible	Negligible	$7,536	Negligible	Negligible	Negligible
Frankford	$63,925	Negligible	Negligible	Negligible	$10,766	Negligible	Negligible	Negligible
Georgetown	Negligible	$5,236	Negligible	Negligible	$69,388	Negligible	Negligible	Negligible

[22] The annualized loss ratio is multiplied by 50,000 (x 500 for a proxy 500-year loss and x 100 for a percentage number.) Low risk equals 0 to 5 percent; Medium risk equals 6 to 20 percent, and High risk is any percentage over 20.

Jurisdiction	Flood	Tropical T Storm Wind	hunder-storm	Tornado	Drought	Hail	Winter Storm	Earthquake
Greenwood	$7,101	Negligible	Negligible	Negligible	$11,048	Negligible	Negligible	Negligible
Henlopen Acres	$409,600	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Laurel	$2,182,198	Negligible	Negligible	Negligible	$40,473	Negligible	Negligible	Negligible
Lewes	$700,624	$7,481	Negligible	Negligible	$65,458	Negligible	Negligible	Negligible
MCD Bridgeville-Greenwood	$1,091,200	$25,390	$17,559	Negligible	$1,530,281	Negligible	$35,556	$11,232
MCD Georgetown	$255,801	$48,865	$11,452	Negligible	$998,028	Negligible	$23,189	$12,767
MCD Laurel-Delmar	$991,374	$95,369	$30,869	Negligible	$2,690,299	Negligible	$62,510	$14,884
MCD Lewes	$19,357,870	$367,759	$14,471	Negligible	$1,261,154	Negligible	$29,303	$40,144
MCD Milford South	$1,912,048	$48,034	$20,936	Negligible	$1,824,606	Negligible	$42,395	$16,310
MCD Millsboro	$36,640,370	$616,112	$16,369	Negligible	$1,426,546	Negligible	$33,146	$16,409
MCD Milton	$445,316	$111,662	$10,649	Negligible	$928,101	Negligible	$21,565	$9,429
MCD Seaford	$1,403,417	$61,270	$15,314	Negligible	$1,334,655	Negligible	$31,011	$21,886
MCD Selbyville-Frankford	$43,167,201	$451,242	$21,801	Negligible	$1,900,032	Negligible	$44,148	$24,987
Milford	$630,092	Negligible	Negligible	Negligible	$142,649	Negligible	Negligible	Negligible
Millsboro	$411,348	$8,191	Negligible	Negligible	$61,221	Negligible	Negligible	Negligible
Millville	$124,808	$10,358	Negligible	Negligible	$35,871	Negligible	Negligible	Negligible
Milton	$338,142	Negligible	Negligible	Negligible	$24,765	Negligible	Negligible	Negligible
Ocean View	$1,008,480	$10,134	Negligible	Negligible	$37,724	Negligible	Negligible	Negligible
Rehoboth Beach	$499,965	$5,387	Negligible	Negligible	$24,588	Negligible	Negligible	Negligible
Seaford	$560,861	$9,739	Negligible	Negligible	$75,703	Negligible	Negligible	$5,284
Selbyville	$148,809	$8,370	Negligible	Negligible	$50,804	Negligible	Negligible	Negligible
Slaughter Beach	$333,152	Negligible	Negligible	Negligible	$20,816	Negligible	Negligible	Negligible
South Bethany	$4,017,172	$5,155	Negligible	Negligible	$7,933	Negligible	Negligible	Negligible
TOTAL	**$129,520,000**	**$1,926,244**	**$168,211**	**$11,000**	**$14,659,834**	**$7,560**	**$340,625**	**$190,778**

Table 4-38: Estimated Level of Risk by Hazard (High, Moderate, Low)

Flood	Hurricane Wind	Thunder storm	Tornado	Drought	Hail	Winter Storm	Earthquake
High	Low	Moderate	Low	Moderate	Low	Moderate	Low

It should be noted that although some hazards may show Medium or Low risk, hazard occurrence is still possible. Also, any hazard occurrence could potentially cause a great impact and losses could be extremely high (i.e., an F5 tornado or a Category 5 hurricane).

Table 4-39: Overall Risk Ranking for Sussex County

Hazard	Rank
Flood	1
Thunderstorm	2
Hurricane Wind	3
Drought	4
Extreme Heat/Cold	5
Winter Storms	6
HazMat Incident	7
Tornado	8
Hail	9
Tsunami	10
Earthquake	Unranked
Wildfire	Unranked
Erosion	Unranked
Dam/Levee Failure	Unranked
Terrorism	Unranked
Pipeline Failure	Unranked

Unique Risks for Local Jurisdictions

To address unique risks within individual jurisdictions of the multi-jurisdictional planning area, the *Unique Risk for Local Jurisdictions* section documents responses gathered from local government officials by the Delaware Emergency Management Agency. Through this process, unique risks were identified for Bethany Beach, as well as all coastal communities within the County.

Town of Bethany Beach

Identified by Bethany Beach Police Department

Bethany Beach experiences tidal flooding on the Back Bays, as well as flooding on all streets east of State Route 1 during severe storms and/or heavy rain. This includes all areas along the oceanfront on the Atlantic Ocean. This flooding is confined to a distinct geographic boundary, streets flood within the corporate limits of Bethany Beach in areas with poor drainage and low elevation. Approximately 650 homes are at risk within this area, as well as several motels on Boardwalk, a lifeguard building and other public facilities. The residential properties hold an estimated value of $500,000 per structure. The 50 or so commercial structures are estimated to be valued at approximately $250,000 to $500,000 each. The lifeguard station and other public facilities have an estimated total value of $500,000. No lifelines or infrastructure are known to be at risk.

Town of Ellendale

Identified by the Town of Ellendale Mayor's Office

Wildfires are known to be caused by coal-fired train engines and loaded coal cars. Sparks from the wheels and tracks have generated fires at least twice in the past two years that are reported to have burnt for more than three days causing damage to forestry and grasslands. No lives, homes, businesses, infrastructure or critical facilities are known to be at risk from this hazard.

All Coastal Communities

Identified by the Delaware Department of National Resources and Environmental Control

One unique hazard affecting all coastal communities in Sussex County is the issue of long- term coastal erosion and sea level rise. Generally speaking, this hazard is confined to the distinct geographic boundaries of the Delaware Bay shore, the Atlantic Ocean coast and the inland bays

SECTION 5: CAPABILITIES ASSESSMENT

Contents of this Section

This section of the Plan discusses the capability of Sussex County and the participating municipal jurisdictions to implement hazard mitigation activities. It consists of four sections:

- What is a Capability Assessment?
- Capability Assessment Update;
- Capability Assessment Findings; and
- Conclusions on Local Capability.

Requirement for the Planning Process

Requirement §201.6(b)(3): *The planning process must include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

What is a Capability Assessment?

The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.[23] As in any planning process, it is important to try to establish which goals, objectives and actions are feasible, based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A capability assessment helps to determine which mitigation actions are practical and likely to be implemented over time given the fiscal, technical, administrative and political framework of the community.

A capability assessment has two primary components: an inventory of a local jurisdiction's relevant plans, programs or policies already in place; and an analysis of its capacity to carry them out. Examination of local capabilities will detect existing gaps, shortfalls or weaknesses with ongoing government activities. A capability assessment also highlights the positive mitigation measures already in place or being implemented at the local government level, which should continue to be supported and enhanced if possible through future mitigation efforts.

The capability assessment completed for Sussex County serves as a critical part of the foundation for designing an effective hazard mitigation strategy. Coupled with the *Risk Assessment*, the *Capability Assessment* helps identify and target meaningful mitigation actions for incorporation in the *Mitigation Strategy* portion of the All Hazard Mitigation Plan. It not

[23] While the Final Rule for implementing the Disaster Mitigation Act of 2000 does not require a local capability assessment to be completed for local hazard mitigation plans, it is a critical step to develop a mitigation strategy that meets the needs of each jurisdiction while taking into account their own unique abilities. The Rule does state that a community's mitigation strategy should be "based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools" (44 CFR, Part 201.6(c) (3)).

only helps establish the goals and objectives for Sussex County to pursue under this Plan, but also ensures that those goals and objectives are realistically achievable under given local conditions.

Capability Assessment Update

The original Capability Assessment survey distributed in 2003 to local government officials, asked specific questions about existing local plans, policies, programs or ordinances that contributed to and/or hindered the community's ability to implement hazard mitigation actions. In addition, a series of questions were asked concerning each jurisdiction's technical, fiscal, administrative and political capabilities to implement mitigation actions. The survey results provided an extensive inventory of existing local plans, policies, programs and ordinances and required local officials to conduct a self-assessment of their jurisdiction's specific capabilities. The 2010 plan information was reviewed and updated during interviews conducted with community officials as part of this update.

Originally, the information provided by the participating jurisdictions in response to the survey questionnaire was incorporated into a database for further analysis. A general scoring methodology[24] was then applied to quantify and rank each jurisdiction's overall capability relative to one another. According to the scoring system, each plan, policy, ordinance or program was assigned a point value based on its relevance to hazard mitigation. Additional points were added based on each jurisdiction's self-assessment of their own fiscal, technical, administrative and political capability. A total score and general capability rating (High, Moderate or Limited) was then determined according to the total number of points received. The survey results also serve as a good source of introspection for those jurisdictions wishing to improve their capability, as identified gaps, weaknesses or conflicts may be recast as opportunities for specific mitigation actions.

During this Plan update process the Capability Assessment results from the 2010 plan were distributed and discussed with participating municipalities. The 2010 information was shared with municipal officials and areas where plans, ordinances, and political, fiscal, or administrative and technical capability had changed were indicated. This information was shared at the Committee meeting and has been incorporated into the overall Capability Assessment.

Capability Assessment Findings

The findings of the capability assessment are summarized in this Plan to provide insight into relevant capacity of Sussex County's jurisdictions to implement hazard mitigation activities. All information is based upon the responses provided by local government officials during one on one interviews and meetings.

[24] A copy of the original survey and the scoring system used to assess County and municipal capabilities is available through Sussex County upon request. Due to the length of the survey and the number of participating jurisdictions, the completed surveys were not included in this document.

Capabilities Assessment

Table 5.1 on the following page provides a summary of the local plans and programs in place for Sussex County's participating local governments. An "X" indicates that the given plan or program is currently in place and being implemented by the local jurisdiction. A more detailed discussion follows, along with the incorporation of additional information based on the narrative comments provided by local officials.

Table 5.1 Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Sussex County	X	X	X	X		X		X	X	X	X	X	X	X	X	X	X		X
Bethany Beach	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Bethel									X			X	X	X		X	X		X
Blades			X						X					X	X	X	X		X
Bridgeville	X		X	X		X	X	X	X	X	X	X	X	X		X	X		X
Dagsboro			X						X		X	X		X	X	X	X		X
Delmar			X			X	X		X	X	X			X	X	X	X		X
Dewey Beach			X	X					X			X		X	X	X	X	X	X
Ellendale			X						X					X	X				X
Fenwick Island	X		X	X	X	X			X		X	X		X	X	X	X	X	X
Frankford			X	X					X		X			X	X	X	X		X
Georgetown			X	X					X		X	X		X	X	X	X		X
Greenwood			X	X					X					X	X	X	X		X
Henlopen Acres Laurel				X		X	X		X		X	X		X	X	X	X		X
Lewes			X		X				X		X			X	X	X	X		X
Millsboro	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Millville			X	X					X					X	X	X	X		X
Milton			X	X					X			X	X	X	X	X	X		X
Ocean View			X	X								X	X	X	X	X	X		X
Rehoboth	X		X	X		X			X		X	X		X	X	X	X		X
Beach Seaford		X	X	X	X	X	X		X		X		X	X	X	X	X	X	X
Selbyville		X	X	X		X	X		X	X		X	X	X	X	X	X	X	X
Slaughter	X		X	X	X	X			X		X	X	X	X	X	X	X		X
Beach South			X			X	X		X			X		X	X	X	X		X
Bethany		X	X	X		X	X		X		X	X		X	X	X	X	X	X

Key to Table 5.1

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning **HPP**
– Historic Preservation Plan **ZO**
– Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

Emergency Management Capabilities

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. Other phases include preparedness, response and recovery. In reality, each phase is interconnected with hazard mitigation as **Figure 5.1** suggests. Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions.

Hazard Mitigation Plan

A Hazard Mitigation Plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. The essential elements of a Hazard Mitigation Plan include a risk assessment, capability assessment and mitigation strategy. Twenty-one of the 25 jurisdictions in Sussex County are participating in the development of this Multi-Jurisdictional All Hazard Mitigation Plan.

In addition, the survey shows that of the twenty communities participating, seven jurisdictions have local hazard mitigation plans. This includes Lewes Delaware that has prepared a Hazard Mitigation and Climate Adaptation Action Plan.

Eighteen jurisdictions report to have completed a Floodplain Management Plan or Flood Mitigation Plan, including Sussex County. Six communities reported completing a Stormwater Management Plan. This is an increase of three communities from the 2010 All-Hazard Hazard Mitigation Plan.

Disaster Recovery Plan: A Disaster Recovery Plan serves to guide the physical, social, environmental and economic recovery and reconstruction process following a disaster. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses.

Survey results indicate that six jurisdictions have prepared a Disaster Recovery Plan. This is a 100 percent increase over the three identified in the 2010 All-Hazard Mitigation Plan.

Emergency Operations Plan: An emergency operations plan outlines responsibilities and the means by which resources are deployed following an emergency or disaster.

Survey results indicate that thirteen jurisdictions have an emergency operations plan. This is an increase of three communities that have completed an EOP since 2010. Sussex County has an EOP which was updated in 2004 and is available to the community via the Sussex County Emergency Operations Center Website.

The municipalities of Bethany, Bridgeville, Delmar, Fenwick Island, Lewes, Rehoboth Beach, Seaford, Selbyville, and South Bethany also have emergency operations plans covering their jurisdictions.

Several of the municipal officials indicated that their jurisdictions continue to rely on the County for emergency operations planning and management.

Continuity of Operations Plan (COOP): COOP Plans establish a chain of command, line of succession and plans for backup or alternate emergency facilities in case of an extreme emergency.

Survey results indicate that nine jurisdictions have completed COOP Plans. This is a doubling over the past 5 years. In 2010 the plan reported only 4 had completed a COOP plan. Many times communities include COOP planning into their Emergency Operations Plan. An additional three communities also have completed a municipal EOP and may also have completed a COOP plan as part of that effort.

Radiological Emergency Plan: A Radiological Emergency Plan delineates roles and responsibilities for assigned personnel and the means to deploy resources in the event of a radiological accident.

Survey results indicate that four jurisdictions have a Radiological Emergency Plan. This has not changed since the 2010 report. However, Sussex County indicated that their Radiological Emergency Plan is a component of their Emergency Operations Plan.

SARA Title III Emergency Response Plan: A SARA Title III Emergency Response Plan outlines the procedures to be followed in the event of a chemical emergency such as the accidental release of toxic substances. These plans are required by Federal law under Title III of the Superfund Amendments and Re-authorization Act (SARA), also known as the Emergency Planning and Community Right-to-Know Act (EPCRA).

The Sussex County Local Emergency Planning Committee (LEPC) has developed an Emergency Response Plan for hazardous materials incidents throughout the County in coordination with

the Delaware State Emergency Response Commission. Sussex County LEPC maintains the goal to review and update the Per Hazardous Material Response Plan annually. In the 2015 SERC Annual Report, the Sussex County Hazardous Material Response Plan is scheduled for review and update in 2016.

All Sussex County Jurisdictions interviewed, with the exception of Milton, report active SARA Title III Emergency Response Plans in place. Many of the municipalities participate in the LEPC through town and city representatives. In addition, the County LEPC has approximately 34 industry representatives engaged as members of the County LEPC.

General Planning Capabilities

The implementation of hazard mitigation activities often involves agencies and individuals with planning and, land use management and risk management from other disciplines. Other stakeholders may include local planners, public works officials, economic development specialists and others. In many instances, concurrent local planning efforts will help to achieve or complement hazard mitigation goals even though they are not designed as such. Therefore, the Capability Assessment included a discussion with each jurisdiction regarding general planning capabilities.

Regional Planning: Regional planning refers to any type of planning effort that involves a community working in conjunction with neighboring jurisdictions. For example, the development of this All Hazard Mitigation Plan is representative of a regional planning effort.

Survey results indicate that sixteen jurisdictions participate in regional planning decisions. Fifteen communities also maintain a Capital Improvement Plan. Sussex County provides coordination with municipalities on issues and projects related to the County's Comprehensive Plan and the State's *Livable Delaware* initiative. Many local jurisdictions also coordinate on regional issues through the Sussex County Association of Towns (SCAT).

All of Sussex County's local jurisdictions are members of the Delaware League of Local Governments (DLLG). The DLLG is a statewide, nonprofit, nonpartisan association of city, town, and County governments established in 1963 to improve and assist local governments through legislative advocacy at the state and Federal level. The DLLG also serves as a clearinghouse for important governmental and business-oriented information.

Comprehensive Plan: A comprehensive plan establishes the overall vision for what a community wants to be and a guide to future governmental decision-making. Typically, a comprehensive plan is comprised of demographic conditions, land use, transportation elements and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can enhance the likelihood of achieving risk reduction goals, objectives and actions.

The State of Delaware requires its counties to adopt and regularly update comprehensive plans in conformity with the Quality of Life Act of 1988. The Act requires the plans to include the following elements: Economic Development, Housing, Conservation (including Agriculture), Historic Preservation, Recreation and Open Space, Accomplishments,

Intergovernmental Coordination, Mobility, Water and Sewer, Community Facilities, and Future Land Use. An optional element is Community Design.

Such plans are used by local governments to establish land-use policies, identify growth areas, and also give consideration to various other community concerns, such as affordable housing availability, agriculture preservation, open space protection, historic preservation, economic development and transportation mobility.

Delaware law mandates that all counties and municipalities have a comprehensive plan in place. Under a change in Delaware law in 2011, counties and municipalities must review and update their plans for State certification every 10 years, while providing yearly updates on the progress of implementation.

Sussex County approved the 2016 Comprehensive Plan Annual Report August 9, 2016.

Table 5.2 shows the progress made as of 2016 by the municipal jurisdictions in Sussex County to update their comprehensive plans according to the Delaware Office of State Planning Coordination.

Table 5.2 Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Bethany Beach	Complete
Bethel	Contacted
Blades	Certified (2008)
Bridgeville	Certified (2016)
Dagsboro	Certified (2003), Contacted
Delmar	Complete (2010) Update Pending 2016
Dewey Beach	In Progress, Contacted
Ellendale	Update in Progress (2009) Contacted
Fenwick Island	Update in Progress (2016)
Frankford	Complete (2009)
Georgetown	Certified (2010) Update in Progress (2016)
Greenwood	Completed (2013)
Henlopen Acres	Completed (2016)
Laurel	Completed
Lewes	Update in Progress (2016)
Millsboro	Certified (2012)
Millville	Completed (2010
Milton	Revised (2015)
Ocean View	Completed (2010) Revised (2012)
Odessa	Complete (2001)
Rehoboth Beach	Complete (2014)
Seaford	Updated (2015)
Selbyville	Certified (2007)

Jurisdiction	Plan Status
Slaughter Beach	Approved 2010 and updated in 2016
South Bethany	Certified (2016) Pending

Source: Delaware Office of State Planning Coordination

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic effect on future hazard vulnerability.

Survey results indicate that most jurisdictions do not have their own stand-alone transportation plan. Five of the jurisdictions reported having a Transportation Plan. There is no change from the 2010 report. Transportation planning (including emergency evacuation planning) is commonly addressed as an element to the local comprehensive plans and in coordination with the Delaware Department of Transportation.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvement plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

Survey results indicate that fourteen jurisdictions have capital improvement plans that regulate the provision or extension of infrastructure in hazard areas. This is an increase of six communities that have now adopted Capital Improvements Plans as part of their development strategy.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages.[25] This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

Survey results indicate that nine jurisdictions have historic preservation plans. There is no change from the 2010 Plan update.

Zoning Ordinances: Zoning represents the means by which local governments control land use. As part of a community's police powers, zoning is used to protect the public health, safety and welfare of those in a given jurisdiction that maintains zoning authority. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations

[25] See Protecting the Past from Natural Disasters. 1989. Nelson, Carl. National Trust for Historic Preservation: Washington, D.C.

enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.

Survey results indicate that all twenty-five jurisdictions listed in the All-Hazard Mitigation Plan have a zoning ordinance.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.[26]

Survey results indicate that twenty-three jurisdictions have a subdivision ordinance. The only two communities that do not have a Subdivision Ordinance are the towns of Bethel and Bridgeville.

Sussex County's zoning ordinance was adopted in 1982 and is periodically updated through association with the zoning ordinance.

Building Codes, Permitting and Inspections: Building Codes regulate construction standards. In many communities, permits are issued for, and inspections of work take place on, new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

Surveys reaffirmed that all jurisdictions interviewed have adopted a local building code.

In addition to using survey results, the adoption and enforcement of building codes by local jurisdictions was assessed using the Building Code Effectiveness Grading Schedule (BCEGS) program developed by the Insurance Services Office, Inc. (ISO).[27] Under the BCEGS program, ISO assesses the building codes in effect in a particular community and how the community enforces its building codes, *with special emphasis on mitigation of losses from natural hazards*. The results of BCEGS assessments are routinely provided to ISO's member private insurance companies, which in turn may offer ratings credits for new buildings constructed in communities with strong BCEGS classifications. The concept is that communities with well-enforced, up-to-date codes should demonstrate better loss experience, and insurance rates can reflect that.

In conducting the assessment, ISO collects information related to personnel qualification and continuing education as well as a number of inspections performed per day. This type of information, combined with local building codes, is used to determine a grade for that jurisdiction. The grades range from 1 to 10, with the lower grade being more ideal. A BCEGS grade of 1 represents exemplary commitment to building code enforcement, and a grade of 10

[26] For additional information regarding the use of subdivision regulations in reducing flood hazard risk, see Subdivision Design in Flood Hazard Areas. 1997. Morris, Marya. Planning Advisory Service Report Number 473. American Planning Association: Washington, D.C.

[27] Participation in BCEGS is voluntary and may be declined by local governments if they do not wish to have their local building codes evaluated.

indicates less than minimum recognized protection. BCEGS grades for each of Sussex County's local jurisdictions are listed in **Table 5.3**.

Table 5.3: BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Sussex County	8
Bethany Beach	*Declined Participation*
Bethel	8*
Blades	*Declined Participation*
Bridgeville	8*
Dagsboro	*Declined Participation*
Delmar	*Not Evaluated*
Dewey Beach	8*
Ellendale	8*
Fenwick Island	8*
Frankford	8*
Georgetown	8*
Greenwood	8*
Henlopen Acres	8*
Laurel	6
Lewes	9
Millsboro	7
Millville	8*
Milton	8*
Ocean View	8*
Odessa	8*
Rehoboth Beach	6
Seaford	6
Selbyville	8
Slaughter Beach	8*
South Bethany	*Declined Participation*

Floodplain Management Capability

Flooding represents the greatest natural hazard facing the nation. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards, such as education, outreach, and the training of local officials, the *National Flood Insurance Program* (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments, but the program is promoted by FEMA and DEMA as a first basic step for implementing and sustaining an effective hazard mitigation program. It is therefore used as a key indicator for measuring local capability.

In order for a County or municipality to join the NFIP, they must adopt a local flood damage prevention ordinance that requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by the 100-year flood, and that new floodplain development will not aggregate existing flood problems or increase damage to other properties.

Another key service provided by the NFIP is the mapping of identified flood hazard areas. Once prepared, the Flood Insurance Rate Maps (FIRMs) are used to assess flood hazard risk, regulate construction practices and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials and the private sector about the likelihood of flooding in their community. Research data obtained through the National Flood Insurance Program shows that the Current Effective Floodplain Map for all jurisdictions is from March 16, 2015. Only one community, Ellendale, is reported as a Non-Special Flood Hazard Area. However, Ellendale was not interviewed. **Table 5.4** summarizes NFIP participation for each of Sussex County's local jurisdictions.

Table 5.4: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date	Current Effective Map
Sussex County	10/06/76	3/16/15
Bethany Beach	4/06/73	3/16/15
Bethel	1/16/81	3/16/15
Blades	1/16/81	3/16/15
Bridgeville	1/07/77	3/16/15
Dagsboro	6/01/81	3/16/15
Delmar	2/27/07	3/16/15
Dewey Beach	6/18/82	3/16/15
Ellendale	4/19/11	NSFHA
Fenwick Island	3/23/73	3/16/15
Frankford	9/16/81	3/16/15
Georgetown	5/05/03	3/16/15
Greenwood	2/24/78	3/16/15
Henlopen Acres	8/15/78	3/16/15

Jurisdiction	NFIP Entry Date	Current Effective Map
Laurel	1/16/81	3/16/15
Lewes	3/15/77	3/16/15
Millsboro	9/01/78	3/16/15
Millville	9/25/81	3/16/15
Milton	8/01/78	3/16/15
Ocean View	9/03/80	3/16/15
Rehoboth Beach	3/30/73	3/16/15
Seaford	2/01/79	3/16/15
Selbyville	7/16/91	3/16/15
Slaughter Beach	7/02/80	3/16/15
South Bethany	10/6/76	3/16/15

Source: FEMA, Community Status Book Report (Delaware) http://www.fema.gov/cis/DE.html

An additional indicator of floodplain management capability is the number of participants in the *Community Rating System* (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP, adding extra local measures to provide protection from flooding. All of the 18 creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class. Class ratings, which run from 10 to 1, are tied to flood insurance premium reductions as shown in **Figure 5.2**. As class ratings improve (decrease), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

Figure 5.2: CRS Premium Discounts, By Class

CRS Class	Premium Reduction
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	0

Source: FEMA- http://www.fema.gov/media-library-data/1458756801023-311019d76271533f6b21ce505df7bd3c/20_crs_508_apr2016.pdf

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years based on community comments to make the CRS more user friendly and extensive technical assistance is also available for communities who request it.

Table 5.5 lists the current CRS communities in Sussex County. A total of seven municipalities belong to the Community Rating System. Of these seven, five municipalities are a class 8 and two municipalities are class 9 communities.

Table 5.5: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Bethany Beach	5/1/09	8
Dewey Beach	10/1/94	8
Fenwick Island	10/1/94	8
Lewes	10/1/92	9
Rehoboth Beach	10/1/95	8
Seaford	10/1/96	9
South Bethany	10/1/07	8

Source: FEMA- http://www.fema.gov/media-library-data/1458756801023311019d76271533f6b21ce505df7bd3c/20_crs_508_apr2016.pdf

Survey results indicate that eighteen jurisdictions interviewed have a floodplain management plan or flood mitigation plan.

All Floodplain maps in the County were updated in May 2015. As a result of these floodplain map updates, all communities in Delaware, which participate in the National Flood Insurance Program will be required to adopt updated floodplain regulatory language to comply with NFIP requirements.

To assist communities in meeting these requirements, DNREC has developed "model" floodplain ordinances which communities may find easier to adopt, rather than amending existing floodplain regulations. Four model ordinances have been developed, to assist both coastal and non-coastal communities, as well as communities wishing to adopt higher floodplain standards, which DNREC highly recommends as a way to reduce flood damage and lower flood insurance premiums.

Stormwater Management Plan: A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

Survey results indicate that six of the jurisdictions interviewed have a stormwater management plan. Many communities identified this as one of their hazard mitigation needs going forward. Several have plans under development utilizing state grants and technical resources to manage stormwater runoff.

County and Municipal Self-Assessment

In addition to the above inventory of existing plans, programs and policies, the Capability Assessment required each local jurisdiction to evaluate the 2010 self-assessment of its capability to implement hazard mitigation activities. As part of this process, County and municipal officials were encouraged to consider the barriers implementing mitigation strategies in addition to the mechanisms that could further such strategies. In response to the survey questionnaire local officials classified the capabilities listed as either "limited," "moderate" or "high":

- Technical capability
- Fiscal capability
- Administrative capability
- Political capability

Table 5.6 summarizes the results of the self-assessment process for technical, fiscal and administrative capabilities. An "L" indicates limited capability; an "M" indicates moderate capability; and an "H" indicates high capability. Further descriptions and discussions on each are provided below, in addition to some of general findings on political capability.

Table 5.6: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative Capability
Sussex County	M	M	M
Bethany Beach	M	M	M
Bethel *	L	L	L
Blades	M	M	M
Bridgeville	M	L	M
Dagsboro *	L	L	L
Delmar	L	L	L
Dewey Beach*	H	H	L

Capabilities Assessment

Jurisdiction	Technical Capability	Fiscal Capability	Administrative Capability
Ellendale*	L	L	L
Fenwick Island	M	M	M
Frankford	M	L	M
Georgetown	L	M	L
Greenwood	M	M	M
Henlopen Acres	M	M	M
Laurel	L	L	M
Lewes	M	M	M
Millsboro	M	M	M
Millville	M	L	L
Milton	L	L	L
Ocean View	M	M	M
Rehoboth Beach	H	M	H
Seaford	M	M	H
Selbyville	M	M	M
Slaughter Beach	L	L	L
South Bethany	M	L	H

*2010 Data. Technical Capability

Technical capability can be defined as possessing the skills and tools needed to improve decision making, including the development and implementation of sound mitigation actions. For purposes of gauging the technical capability of Sussex County's local jurisdictions for mitigation planning purposes, the Capability Assessment interview focused on the local availability and application of Geographic Information Systems (GIS).

A majority of cities and towns don't employ GIS staff or have direct access to GIS systems due to financial limitations. Sussex County maintains a GIS system. Many local officials also

indicated that they rely on Sussex County and state agencies to provide technical capabilities and resources, as needed.

The analysis of the responses to the Capability Assessment indicated that there is generally a *limited, to moderate* technical capability of Sussex County's jurisdictions to implement mitigation strategies. Eight of the 25 jurisdictions indicated they had limited technical capability; fifteen indicated they had moderate technical capability; and two indicated they had high technical capability. Approximately six communities have shifted from low to moderate. This is a substantial shift in technical capabilities of Sussex County communities to moderate technical capability.

Recommendations: Technical capabilities among the communities in the County have significantly increased. It is evident that the strategy of developing resource and capability sharing has been successful over the past five years. Several communities also have increased staffing to provide more technical capabilities within the community. There are still communities with limited technical capabilities throughout the County. There remains a need for ongoing support for a systematic sharing of technical resources to support risk reduction strategy development. Sharing resources and capabilities with the County should continue to increase the level of technical capability to analyze natural hazards and develop meaningful actions to reduce their impact. This includes additional training to enhancing the ability to use information technologies to facilitate the formulation, development, implementation and monitoring of mitigation efforts.

Fiscal Capability

The ability to take action is often closely associated with the amount of money available to implement policies and projects. This may take the form of grants received or state and locally based revenue. The costs associated with policy and project implementation vary widely. In some cases, policies are tied primarily to staffing costs associated with the creation and monitoring of a given program. In other cases, money is linked to an actual project, like the development of stormwater management strategies and the acquisition of flood-prone homes, which can require a substantial commitment from local, state and federal funding sources.

It is imperative that jurisdictions research non-federal sources of revenue and funding for risk management strategies. This will lead to a reduction in the dependence on the availability of federal and state funding to implement mitigation actions. Additional assistance may be available from economic development and private sector partnerships that would consider funding community resiliency to support overall growth and sustainability.

The analysis of the responses to the Capability Assessment indicated that there has been movement of a significant number of communities from limited to moderate fiscal capability of Sussex County's jurisdictions to implement mitigation strategies. In part this is due to significant growth and development in the County.

Eleven jurisdictions indicated they had limited fiscal capability. Thirteen municipalities, and Sussex County, now identify as having moderate fiscal capabilities to support mitigation efforts and one indicated they had high fiscal capability.

Recommendations: The results of the local Capability Assessment should be used as a general guide to help craft mitigation actions that are achievable. When considering the effect of fiscal capability on the implementation of mitigation policies and projects, jurisdictions should consider whether the actions require monetary commitment or staff resources. Consideration should be given to available government and non-governmental grant funding sources. It may also be possible to combine resources such as Community Development Block Grants, rural development grants and County or other resources to meet risk reduction priorities. In addition, it may be possible to create a regional effort by working with other municipalities to offset costs of implementation. Consideration should also be made as to whether the jurisdiction is willing to commit local revenue to assure community resiliency and sustainability.

In most cases, in order to implement mitigation projects and policies, some monetary commitment or staff resources will be required as a cost share. This may take the form of a non-federal match requirement or the costs associated with staff time devoted to project administration, policy development, program implementation and monitoring. The identification of eligible Pre-Disaster Mitigation projects, as well as other federal funding sources identified in the Sussex County Multi-Jurisdictional All Hazard Mitigation Plan, enables communities to compete nationally for available funding. The County and municipal governments should consider, whenever possible, combining financial and staff resources to address hazards, most of which tend to impact regions rather than individual jurisdictions.

Finally, if local governments have access to an ongoing source of revenue, rather than a strict reliance on grant funds, a more comprehensive and sustained mitigation effort can be achieved. Examples include the development of a stormwater utility fee, special district for floodplain management, or the development of a budgetary line item that specifically addresses hazard mitigation.

Administrative Capability

County and municipal staffing and existing organizational structures for local governments were evaluated to implement mitigation strategies and administrative capability. The ability of a local government to develop and implement mitigation projects, policies and programs is directly tied to its ability to direct staff time and resources for that purpose.

The analysis of the responses to the Capability Assessment indicated that there is generally a *moderate to high* administrative capability of Sussex County's jurisdictions to implement mitigation strategies. Nine jurisdictions indicated they had limited administrative capability, while thirteen indicated they have moderate administrative capability. Two communities report high administrative capability. Local municipal jurisdictions in Sussex County indicated that they work cooperatively with the County on many activities, helping to offset their administrative and staff limitations. This includes emergency-related activities

coordinated by the Sussex County EOC and through mutual aid agreements between police and fire departments, but not specifically mitigation activities. Many communities report that there is an increase in staffing focused on municipal services and code enforcement. However, some local officials report minimal full-time staff to implement local government programs, and rely heavily on volunteers, outside agencies and professional consultants.

Recommendations: Demand for services continues to grow within the County. Many communities report that their year around population has grown significantly over the past 5 years. Many seasonal homeowners are now becoming permanent residents. This has created a demand for municipal services and an increase in staffing. The County and larger municipalities tend to possess a stronger administrative capability than smaller communities. This is primarily due to fiscal limitations, as smaller jurisdictions by nature have a limited tax base to support local government services. The development of local administrative capability could best be achieved through enhanced intergovernmental cooperation, outreach, training and mentoring for smaller jurisdictions as well as the sharing of resources, when appropriate.

Local governments with a need to enhance local internal staff's emergency management expertise should consider sending staff to the free or low-cost training seminars available through DEMA's Training Program and FEMA's Emergency Management Institute. In preparing local mitigation strategies, local governments should look to integrate hazard mitigation activities into routine governmental functions whenever possible, particularly when limited to only a few full-time employees.

Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to reduce the impact of future hazard events. Due to the nature of the difficulties, political capabilities were discussed on a more informal nature.

In many cases, hazard mitigation initiatives may not be a local priority or can be mistakenly seen by local leaders as an impediment to other goals of the community. The local political climate must be considered in designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing their adoption or implementation.

Political capability was discussed in general terms. The discussions showed that there is generally a *moderate* political capability of Sussex County's jurisdictions to implement mitigation strategies. Due to several coastal events such as Hurricane Sandy, coastal and riverine flooding and severe wind events, hazards and disasters have increased as a significant issue of concern in Sussex County. Local political climate is favorable for implementing mitigation actions that are consistent with sustainability and community growth.

An example of the political climate in favor of hazard mitigation can be found in the update of this plan. The planning team and Sussex EOC leadership met with both the County Planning and Zoning Commission and the County Council to discuss the planning process and value of hazard mitigation on community resiliency and growth.

Recommendations: Increasing local political capability to implement mitigation strategies is most often achieved through a coordinated approach to loss reduction that includes:

- Community outreach efforts designed to inform residents and businesses of the risk faced by natural hazards,
- Gaining community support through a wide range of local interest groups (particularly those that may be affected by proposed actions), and
- Informing and educating the elected and executive officials of the community in advance of the formal decision making process.

Identifying key stakeholders early in the process of designing and proposing mitigation strategies should generate community support. This will help eliminate or minimize potential impediments to acceptance before strategies become drafted or officially proposed.

Local elected and executive officials should become informed and educated on mitigation strategies in advance of any formal considerations or decisions. This will facilitate a greater understanding of specific mitigation objectives and expected outcomes.

Conclusions on Local Capability

The capability of local governments in Sussex County varies greatly from jurisdiction to jurisdiction.

Sussex County's local governments should continue to work with each other beyond the development of this Plan in order to maximize existing resources and local capabilities. The City of Lewes has gained considerable knowledge and expertise in applying hazard mitigation principles through local government programs, and should serve as a mentor to its neighboring communities in Sussex County. As the above findings indicate, Sussex County has significantly more capability than its municipal jurisdictions and should serve as a clearinghouse for information while striving to enhance and maintain intergovernmental cooperation and coordination.

This Plan update provides the vehicle to begin this process. However, in order to succeed, it will require clearly articulating the benefits of participating in and sustaining the countywide mitigation planning process. One of the best ways to obtain local buy-in and long-term success is to identify and implement achievable mitigation actions (as listed in this Plan's *Mitigation Strategy*) that will facilitate continued intergovernmental coordination not only across the County, but with state and federal agencies as well.

The conclusions of the *Capability Assessment* and *Risk Assessment* serve as the foundation for a meaningful hazard mitigation strategy.

During the process of identifying the goals, objectives and mitigation actions, each jurisdiction must consider not only their level of hazard risk but also their existing capability to minimize or eliminate that risk.

In jurisdictions where the overall hazard risk is considered to be HIGH, and local capability is considered LIMITED, then specific mitigation actions that account for these conditions should

be considered. This may include less costly actions such as minor ordinance revisions or public awareness activities. Further, if necessary, specific capabilities may need to be improved in order to better address recurring threats. Similarly, in cases where the hazard vulnerability is LIMITED and overall capability is HIGH, more emphasis can be placed on actions that may impact future vulnerability such as guiding development away from known hazard areas.

There have been no major changes that warranted a change in the hazard risk or overall capability for the County (unincorporated areas) or municipalities.

SECTION 6: MITIGATION STRATEGY

Contents of this Section

- Requirement for a Mitigation Strategy
- Mitigation Goals and Objectives
- Potential Mitigation Actions Identified
- Mitigation Measures Prioritization and Implementation

Requirement for a Mitigation Strategy

Requirement §201.6(c)(3): *The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

Requirement §201.6(c)(3)(i): *[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

Requirement §201.6(c)(3)(ii): *[The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.]*

Requirement: §201.6(c)(3)(iii): *[The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization **shall** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

Requirement §201.6(c)(3)(iv): *For multi-jurisdictional plans, there **must** be identifiable action items specific to the jurisdiction requesting Federal Emergency Management Agency (FEMA) approval or credit of the plan.*

Mitigation Goals, Objectives, and Actions

The intent of the *Mitigation Strategy* is to provide Sussex County and participating jurisdictions with the tools necessary to continue to reduce the impact of natural and human-caused hazards. In order to achieve these aims, this section covers the following components:

- Mitigation Goals
- Identification and Analysis of Mitigation Measures
- Mitigation Actions

Mitigation Strategy

This section contains goals, objectives, and action items for the Sussex County Multi-Jurisdictional All-Hazard Mitigation Plan. For the purposes of this Plan, the following definitions are proposed:

- **Goals** are general guidelines that explain what the County and participating municipalities want to achieve. Goals are expressed as broad policy statements representing desired long-term results.
- **Hazard Mitigation Policies** are defined as a course of action agreed to by members of the Planning Team
- **Mitigation Actions** are the specific steps (projects, policies, and programs) that advance a given objective. They are highly focused, specific, and measurable.

The hazard identification and risk assessment in Sections 3 and 4 consisted of identifying the hazards that affect Sussex County and the potential for damage to community assets that are vulnerable to the hazards. Section 5 identified the strengths and weaknesses of local capabilities. The goals and objectives described below were established by the Sussex County Hazard Mitigation Steering Committee and validated by the Sussex County Hazard Mitigation Working Group members in response to these assessment results. Many of the actions described below apply to the County and all participating municipalities.

The broad goals of the Sussex County Multi-Jurisdictional All-Hazard Mitigation Plan are as follows:

- **Goal 1:** Sussex County and participating municipalities will continue to adopt enhanced stormwater management practices.
- **Goal 2:** Sussex County and participating municipalities will continue to adopt and enforce codes and regulations designed to reduce the impact of natural hazards.
- **Goal 3:** Sussex County and participating municipalities will continue to retrofit and protect critical facilities and infrastructure from natural hazards.
- **Goal 4:** Sussex County and participating municipalities will continue to enhance education and outreach strategies to improve the dissemination of information to the public regarding hazards, including the steps that can be taken to reduce their impact.
- **Goal 5:** Sussex County and participating municipalities will continue to improve pre-event planning and preparedness activities.
- **Goal 6:** Sussex County and participating municipalities will continue to identify and implement sound hazard mitigation projects.

Identification and Analysis of Mitigation Measures

In reformulating the Sussex County Mitigation Strategy, a wide range of activities was considered in order to help achieve the goals of participating jurisdictions. All actions chosen by County and municipal government officials fell into one of the broad categories of mitigation techniques listed below.

Mitigation Techniques

1. **Prevention**: Preventative activities are intended to keep hazard problems from getting worse. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:
    - Planning and zoning
    - Hazard mapping
    - Open space preservation
    - Floodplain regulations
    - Stormwater management
    - Drainage system maintenance
    - Capital improvements programming
    - Shoreline / riverine / fault zone setbacks

2. **Property Protection**: Property protection measures enable structures to better withstand hazard events, remove structures from hazardous locations, or provide insurance to cover potential losses. Examples include:
    - Acquisition
    - Relocation
    - Building elevation
    - Critical facilities protection
    - Retrofitting (i.e., wind proofing, flood proofing, seismic design standards, etc.)
    - Insurance
    - Safe room construction

3. **Natural Resource Protection**: Natural resource protection activities reduce the impact of hazards by preserving or restoring the function of natural systems. Examples of natural systems that can be classified as high hazard areas include floodplains, wetlands and barrier islands. Thus, natural resource protection can serve the dual purpose of protecting lives and property while enhancing environmental goals such as improved water quality or recreational opportunities. Parks, recreation or conservation agencies and organizations often implement these measures. Examples include:
    - Floodplain protection
    - Beach and dune preservation
    - Riparian buffers
    - Fire resistant landscaping
    - Erosion and sediment control
    - Wetland restoration
    - Habitat preservation
    - Slope stabilization

4. **Structural Projects**: Structural mitigation projects are intended to lessen the impact of hazards by modifying the environment or hardening structures. Structural projects are usually designed by engineers and managed or maintained by public works staff. Examples include:
    - Reservoirs
    - Levees, dikes, floodwalls, or seawalls
    - Detention and retention basins
    - Channel modification
    - Beach nourishment
    - Storm sewer construction

5. **Emergency Services**: Although not typically considered a mitigation technique, emergency services minimize the impact of a hazard on people and property. Actions taken immediately prior to, during, or in response to a hazard event include:
    - Warning systems
    - Search and rescue
    - Evacuation planning and management
    - Flood control techniques

6. **Public Information and Awareness**: Public Information and awareness activities are used to advise residents, business owners, potential property buyers, and visitors about hazards and mitigation techniques they can use to protect themselves and their property. Examples of measures used to educate and inform the public include:
    - Outreach and education
    - Training
    - Speaker series, demonstration events
    - Real estate disclosure
    - Hazard expositions

Sussex County will continue to follow the guidelines set forth in the Hazard Mitigation Administrative Plan which detail these minimum project criteria:

- Have a beneficial impact upon the designated disaster area, whether or not located in the declared area,
- Be in conformance with 44 CFR Part 9, Floodplain Management and Protection of Wetlands, 44 CFR Part 10, Environmental Considerations, and Executive Orders,
- Solve a problem independently or constitute a functional portion of a solution where there is assurance that the project as a whole will be completed. Projects that merely identify or analyze hazards or problems are not eligible,
- Be cost-effective and substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster; Benefit Cost Analysis will be developed per FEMA standards, and
- Not be eligible under another federal program or grant.

National Flood Insurance Program, Floodplain Management, and Building Codes

Improved floodplain management, including land use planning, zoning, and enforcement at the local level can reduce flood related damages for both existing buildings and new development, and are consistent with stated Goals and Objectives of this plan. The use of the National Flood Insurance Program (NFIP) is critical to the reduction of future flood damage costs to the taxpayer.

All developments, regardless of the location, require a permit to include buildings, fill, and any other type development. Under Delaware's *home rule* system, different offices in the various municipalities have authority over the necessary permits.

The NFIP requires that when the cost of reconstruction, rehabilitation, addition, or other improvements to a building equals or exceeds 50% of the fair market value, then the building must meet the same construction requirements as a new building. Substantially damaged buildings must be brought up to new construction standards. A residence or building damaged so that the cost of repairs equals or exceeds 50% of the structure's fair market value must also be elevated above the Base Flood Elevation (BFE) in flood zones where BFE's are available.

See **Table 6-1** for the dates on which the municipalities in Sussex County joined the NFIP. Each participating municipality within Sussex County is expected to appoint a Floodplain Manager to enforce municipal floodplain ordinances. These ordinances are intended to address methods and practices to minimize flood damage to new and substantial home improvement projects, as well as addressing zoning and sub-division ordinances and state regulations as enforced through the Delaware Department of Natural Resources and Environmental Control.

Table 6-1: National Flood Insurance Program

Name of Community	Date Joined NFIP
Sussex County	10/06/76
Town of Bethany Beach	4/06/73
Town of Bethel	1/16/81
Town of Blades	1/16/81
Town of Bridgeville	1/07/77
Town of Dagsboro	6/01/81
Town of Delmar	2/28/07
Dewey Beach	6/18/82
Town of Ellendale	4/19/11
Town of Fenwick Island	3/23/73
Town of Frankford	9/16/81
Town of Georgetown	5/05/03
Town of Greenwood	2/24/78
Town of Henlopen Acres	8/15/78

Name of Community	Date Joined NFIP
Town of Laurel	1/16/81
City of Lewes	3/15/77
Town of Millsboro	9/01/78
Town of Millville	9/25/81
Town of Milton	8/01/78
Town of Ocean View	9/03/80
City of Rehoboth Beach	3/30/73
City of Seaford	2/01/79
Town of Selbyville	7/16/91
Town of Slaughter Beach	7/02/80
Town of South Bethany	10/6/76

Source: FEMA

Within floodplain management as a whole, the education process must play an important role. An effective education program should be implemented to show citizens the importance of building codes and ordinances and how cost effective they could be in reducing future damages.

Established through the NFIP, the Community Rating System (CRS) is a program that counties and municipalities can elect to join. Once a jurisdiction has joined, participants residing in that jurisdiction receive a discount on their flood insurance premiums, **Table 6-2**. As a result of being part of the CRS, the jurisdiction would have to actively pursue public outreach programs. **Table 6-3** identifies the CRS participating communities within Sussex County. One of the requirements of CRS is an annual outreach project, such as a Repetitive Loss Outreach Program. This program would focus on repetitive loss areas within the jurisdiction and consist of three main components.

Table 6-2: CRS Premium Discounts, By Class

CRS Class	Premium Reduction
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	0

Source: FEMA

Table 6-3: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Bethany Beach	5/1/09	8
Dewey Beach	10/1/94	8
Fenwick Island	10/1/94	8
Lewes	10/1/92	9
Rehoboth Beach	10/1/95	8
Seaford	10/1/96	9
South Bethany	10/1/07	8

Source: FEMA- http://www.fema.gov/business/nfip/crs.shtm

The first step in the Repetitive Loss Outreach Program is to advise the homeowners that they live in a repetitive loss area and could be subject to flooding. The second step is to give the homeowner appropriate property protection measure guidelines. The third is to make the homeowner aware of the basic facts about flood insurance.

The Delaware Unified Construction Code is the mandated construction code for all Delaware municipalities. Each County Building Code Office controls and coordinates all construction code and sub-code officials that enforce the state's Uniform Construction Code within their respective counties.

However, the State's Department of Environmental Protection is the lead state agency for the administration of the State's Floodplain Management Program. Each community that participates in the NFIP must adopt and enforce municipal floodplain management regulations that meet or exceed the minimum requirements of the NFIP as directed by the State's Floodplain Management Program. This requirement is in addition to the enforcement of the State Uniform Construction Code.

Each municipality in Sussex County that is a participating community in the NFIP Program is required to have both a well-trained municipal floodplain manager and construction code official. To ensure adequate enforcement of both codes, each community in Sussex County should encourage additional training opportunities for all code enforcement personnel and include the municipal floodplain manager.

Floodplain management and building codes assist the community with problems experienced from floods, hurricanes, tornadoes, and thunderstorms/lightning/high winds as well as other lower priority hazards.

Participation in the NFIP is based on a voluntary agreement between a community and FEMA. Compliance with the NFIP however, extends beyond mere participation in the program. The three basic components of the NFIP include, 1) Floodplain identification and mapping risk; 2) Responsible floodplain management; and 3) Flood insurance. **Table 6-4** identifies the NFIP requirements and documents how the County addresses these requirements. The table is based on a list of questions developed by DEMA.

Table 6-4: Sussex County NFIP Compliance

1. Floodplain Identification and Mapping			
Requirement	**SHMO Recommended Action**	**Yes/No**	**County Action**
a. Does the County maintain a copy effective FIRM (flood insurance rate map) maps and FIS (flood insurance study) that is accessible to the public?	Place these documents in the local libraries.	Yes	Maintained on file by the Sussex County Department of Planning and Zoning.
b. Has the County adopted the most current DFIRM or FIRM and FIS?	State date of adoption, if done.	Yes	Jan 6, 2005
c. Does the County support request for map updates?	If yes, state how.	No	Map changes, revisions, and amendments are reviewed by the County CFM (Jeff Shockley), and submitted to FEMA for further study and determination.
d. Does the County share with FEMA any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	Sussex County has not conducted any studies that have included new data for map revisions. Suggestions and ideas for certain areas have been offered.
e. Does the County provide assistance with local floodplain determinations?	If yes, specify how.	Yes	Sussex County Planning and Zoning Department assists property owners in identifying their location relative to the FIRMs.
f. Does the County maintain a record of approved Letters of Map Change?	If yes, specify the office that does it.	Yes	The Sussex County Department of Planning and Zoning maintain these files on record.
2. Floodplain Management			
Requirement	SHMORecommended Action	Yes/No	County Action
a. Has the municipality adopted a compliant floodplain management ordinance that at a minimum regulates the following:	If yes answer, (1) - (4) below.	Yes	Yes
(1) Does the County issue permits for all proposed development in the SFHA?	If yes, specify the office.	Yes	The Department of Planning and Zoning Commission and Sussex County Council issue permits for proposed development and subdivision in the SFHA.

(2) Does the County obtain, review and utilize any Base Flood Elevation and floodway data, and require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office that does it.	Yes	The Sussex County Department of Planning and Zoning requires this for proposed subdivision application.
(3) Does the County identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the Base Flood Elevation, including anchoring, using flood resistant materials, designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office that does it.	Yes	Inspection and enforcement done by the Sussex County Department of Planning and Zoning.
(4) Does the County document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures.	If yes, specify the office that does it.	Yes	Files on record and maintained by the Sussex County Department of Planning and Zoning.
b. If a compliant floodplain ordinance was adopted, does the County enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Sussex County Planning and Zoning coordinates with DNREC and FEMA for community assessments; identifies properties in violation; and works with property owners to achieve compliance

3. Flood Insurance			
Requirement	SHMO Recommended Action	Yes/No	Sussex County Action
a. Does the County educate community members about the availability and value of flood insurance?	If yes, specify how. See Note 1.	No	Sussex County focuses primarily on proposed development and construction requirements within the floodplain. The flood insurance issues are directed to DNREC.
b. Does the County inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	The public is notified when the maps are updated and prior to Sussex County adoption of the maps.
c. Does the County provide general assistance to community members relating to insurance issues?		Yes	Sussex County offers preliminary assistance relating to flood insurance issues, but directs on to DNREC for finalization.

Potential Mitigation Actions Identified

Sussex County and its municipalities have identified several hazard mitigation actions that would benefit the County. These actions were identified in the HMSC and HMWG meetings, which included input from representatives of governmental organizations, local businesses, and private citizens. This was based in part on consideration of the range of potential mitigation actions for hazards faced by Sussex County and its constituent municipalities, which are described below.

Public Awareness

Insurance industry and emergency management research has demonstrated that awareness of hazards is not enough. People must know how to prepare for, respond to, and take preventive measures against threats from natural hazards. This research has also shown that a properly run local information program is more effective than national advertising or public campaigns.

Although concerted local, County, and statewide efforts to inform the public exist, lives and property continue to be threatened when segments of the population remain uninformed or choose to ignore the information available. Public education serves to assist the communities with problems experienced from floods, hurricanes, tornadoes, and thunderstorms / lightning / high winds as well as other lower priority hazards. Educating the public of these life and property saving techniques must remain a high priority item at the local, state, and federal level and is consistent with the goals of this plan.

Projects identified by the HMSC and HMWG are as follows:

- Develop an *All-Hazards* public education and outreach program for hazard mitigation and preparedness,
- Initiate a public awareness program on local TV/radio for hazard safety,
- Conduct evacuation exercises with and for local Office of Emergency Management (OEM) personnel and private citizens,

- Conduct yearly workshops related to FEMA hazard mitigation grant programs, including the Flood Mitigation Assistance (FMA) Grant Program, Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) Grant Program, Severe Repetitive Loss (SRL) grant program, and Repetitive Flood Claims (RFC) Grant Program, with a focus on those aspects available to private firms and property owners, and
- Educate the public through Delaware Emergency Management Agency (DEMA) outreach programs and hazard mitigation workshops.

Flood Mitigation Actions

Retrofitting structures prone to periodic flooding is an effective mitigation technique to reduce the flood loss of property and is consistent with stated goals. Techniques include the elevation of structures, acquisition, mitigation reconstruction, dry flood-proofing, wet flood-proofing, drainage improvements, and installation of generators.

- **Elevation** involves raising a structure on a new foundation so that the lowest floor is above the Base Flood Elevation (BFE). Almost any structure regardless of type or size can be elevated.
- **Acquisition of structures** or *buyout* option is the most effective mitigation technique to reduce the loss of property due to flooding. The owners of repetitive flood loss structures sell their structure to the municipality on a cost share basis for the fair market value of the structure prior to the last flood event. The structure is removed / demolished and a deed restriction is placed on the property for perpetuity, thus eliminating the structure from future flood damage. This approach is most effective when flood-prone structures located within the same vicinity are grouped together and acquired. The remaining property can be converted into usable recreational space with minor structure restrictions.
- **Mitigation Reconstruction** is a component of the Severe Repetitive Loss (SRL) grant program that allows demolition and reconstruction of structures when traditional elevation cannot be implemented. This activity can be used for structures that were substantially damaged or destroyed. Currently, this is a pilot program utilized mainly on the Gulf Coast, but can be considered a potential approach to mitigation activities.
- **Dry flood-proofing** techniques include the building of floodwalls adjacent to existing walls, the installation of special doors to seal out floodwaters, and the installation of special backflow valves for water and sewer lines. Wet flood-proofing includes low cost mitigation measures such as raising air conditioners, heat pumps, and hot water heaters on platforms above the BFE.
- **Wet flood-proofing** includes measures applied to a structure that prevent or provide resistance to damage from flooding while allowing floodwaters to enter the structure or area. Generally, this includes properly anchoring the structure, using flood resistant materials below the BFE, protecting mechanical and utility equipment, and use of openings or breakaway walls. Application of wet flood-proofing as a flood protection technique under the NFIP is limited to enclosures below elevated residential and non-residential structures and to accessory and agricultural structures that have been issued variances by the municipality.

- **Drainage** is a time-tested technique to mitigate flood damage that improves the drainage capacity around roads and low-lying areas. Maintenance of drainage canals and laterals is essential to maximize their efficiency and continued long term effectiveness. Actions in general to reduce the effects of flooding are widening and deepening the earthen canals, cleaning of existing ditches, and replacing existing culverts, upgrading pumps, and installing check valves and inverts in certain culverts. Maintaining and improving drainage serves to assist the municipalities with problems experienced from floods and severe storms.
- **Generators** are another cost effective retrofitting technique. By providing power with generators during and after severe storms, many critical facilities may continue to provide necessary services to municipalities. The installation of generators serves to assist a municipality with problems experienced from floods, high wind, severe storms, earthquakes, and dam failure.

Wind Retrofitting Mitigation Actions

Structures can be retrofitted to withstand high winds by installing hurricane shutters, roof tie-downs, and other storm protection features. Protecting the interior of the structure and providing stability against wind hazards associated with hurricanes maintain the exterior integrity. These types of measures can be relatively inexpensive and simple to put in place.

Another retrofitting technique is to bury electric power lines to avoid tree limbs falling on them or from wind damage resulting in a break in service to the consumer. Burying electric power lines serves to assist the communities with problems experienced from floods, high winds, and severe storms.

Early Warning Systems

With sufficient warning of a flood, a community and its residents can take protective measures such as moving personal property, cars, and people out of harm's way. When a flood threat recognition system is combined with an emergency response plan that addresses the municipality's flood problems, considerable flood damage can be prevented. This system must be coupled to warning the general public, carrying out appropriate tasks, and coordinating the flood response plan with operators of critical facilities.

A comprehensive education and outreach program is critical to the success of early warning systems so that the general public, operators of critical facilities, and emergency response personnel will know what actions to take when warning is disseminated.

Early warning systems serve to assist municipalities with problems experienced from floods, high winds, severe storms, and dam failure, as well as other lower priority hazards.

Earthquakes

Significant seismic events, while not common to the region, do pose a potentially significant threat to Sussex County and the surrounding area. The most practical preventative action to be considered concerns appropriate building code enforcement. While this is not necessarily

practical for existing structures except for renovations or reconstruction, there are activities that can be taken to mitigate further exposure to risk.

For example, one technique is a building retrofit involving the use of reinforced concrete materials in combination with cross ties to provide current structures with additional stabilization. The addition of seismic stabilizer platforms for important or critical mechanicals within buildings will also significantly reduce adverse impacts.

Dam and Levee Failure

Mitigation for dam and levee failure is often similar to that which can be done for flooding; however, dam and levee failure has the potential to cause catastrophic damage for which the majority of flood mitigation measures would be ineffective. Some solutions include:

- **Educational Outreach:** Develop and conduct educational outreach programs on the associated risks that close proximity to dams and levees presents,
- **Building Codes:** Adopt building codes using a flood protection elevation, which is based on dam or levee failure water levels,
- **Warning Systems:** Install warning systems to prevent loss of life in the event of a dam or levee failure,
- **Land Use:** Avoid construction in areas located within a dam or levee high velocity inundation zone, and
- **Inundation Studies:** Conduct detailed studies to identify the inundation areas including potential water velocity and height.

Wildfire

The following mitigation measures can be applied to those areas of the County, which are designated as wildfire risk zones.

- **Educational Outreach:** Develop and conduct educational outreach programs on wildfire prevention including training on fire safe building for contractors and homeowners,
- **Retrofitting:** Existing buildings can be retrofitted to reduce their vulnerability to wildfires. Potential measures include covering roof vents with wire mesh to prevent entry of embers or flaming debris and replacing flammable roof materials such as wood or certain types of shingles. Fire resistant roofing materials include various tiles, fiberglass shingles, and single ply membranes,
- **Safety Zones:** Safety zones can be created around structures by reducing or eliminating brush, trees and vegetation around a home or facility. FEMA recommends using a 30' safety zone, including keeping grass below 2" tall and clearing all fallen leaves and branches promptly, and
- **Fire Breaks:** Roads and trails can be planned so as to serve a dual function as firebreaks. Firebreaks are areas of inflammable materials, which create a fuel break and do not allow fires to spread.

Mitigation Measures Prioritization and Implementation

County and Municipality-Specific Mitigation Actions

Strategies for hazard mitigation within Sussex County and the municipalities were identified to reduce damage to those areas and conform to the requirements of the Code of Federal Regulations. The mitigation action tables found in the **jurisdiction specific annexes** indicates the specific mitigation actions on a community-by-community basis including the rankings assigned to the projects by the municipalities.

Each participating municipality in Sussex County identified mitigation actions and programs based upon the risk assessment **(Section 4)** and capabilities assessment **(Section 5)**. These are detailed in specific annex tables. In all cases, these actions support the goals of the plan, i.e., pursue mitigation projects including repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities.

SECTION 7: PLAN MONITORING AND MAINTENANCE

Contents of this Section

- Requirement for the Plan Monitoring and Maintenance
- Method for Monitoring the Plan
- Schedule for Monitoring the Plan
- Method and Schedule for Evaluation and Updating the Plan
- Plan Amendment Process
- Update Implementation
- Other local Planning Mechanisms
- Continued Public Involvement

Requirement for the Planning Process

Requirement §201.6(c)(4)(i): [The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle

Requirement §201.6(c)(4)(ii): [The plan **shall** include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Requirement §201.6(c)(4)(iii): [The plan maintenance process **shall** include a] discussion on how the community will continue public participation in the plan maintenance process.

Method for Monitoring the Plan

The Director of the Emergency Operations Center will monitor the Plan for several related purposes:

- Maintain and update hazard and risk information,
- Ensure that mitigation projects and actions reflect the priorities of Sussex County and municipal stakeholders,
- Comply with Federal Emergency Management Agency (FEMA) and the State of Delaware requirements for plan maintenance, and
- Maintain Sussex County's eligibility for federal disaster assistance and mitigation grants.

The Director will continuously monitor the Plan with respect to the purposes noted above, according to the schedule described in Schedule for Monitoring the Plan, and with respect to the update triggers noted in the Method and Schedule for Updating the Plan section below.

Specifically, monitoring activities will consist of:

- Soliciting and reviewing reports from participating municipalities regarding status of implementation of action items from the Plan. Status reports will indicate if projects have been:
    - Scoped and/or documented for FEMA grant applications,

  - Submitted for FEMA funding programs,
  - Approved (or denied approval) for FEMA funding,
  - Documented for funding by other means (e.g., municipal capital improvement plans),
  - Funded (or not approved for funding) by other means;
  - Under construction;
  - Completed, and
  - (For completed projects only) Subject to hazard conditions such that avoided losses can be documented.
- Tracking progress of sources of improved or revised data for use in subsequent Plan updates on an annual (at a minimum) basis.
- Preparing a report of the status of implementation of action items from the Plan and the availability of improved or revised data. The report will include recommendations to the Hazard Mitigation Working Group regarding the need and/or advantages of undertaking updates to all or part of the Plan prior to the five-year required update (see Method and Schedule for Updating the Plan).

Schedule for Monitoring the Plan

Informal Plan monitoring activities will be ongoing. In addition to the FEMA mandated five-year update cycle, the Director or their designee (Coordinator) will perform monitoring activities for the Plan as described in Method for Monitoring the Plan every six months, or more often as circumstances require.

In addition to the scheduled reports, the Coordinator will convene meetings after damage-causing natural hazard events to review the effects of such events. Based on those effects, adjustments to the mitigation priorities identified in Section 6 may be made or additional event-specific actions identified.

Method and Schedule for Evaluation and Updating the Plan

[**Note to Reviewers**: The missing dates in this Section will be provided once these events have occurred]

Comprehensive evaluation of and updates to this Plan will be undertaken on a five-year cycle. This Plan was adopted on [Insert Date], and thus must undergo a formal FEMA-compliant update process by [Insert Date + 5 years]. Approximately one year prior to the five-year anniversary of this Plan adoption or sooner, if circumstances require, the Director will initiate a comprehensive review of the Plan with particular attention to FEMA guidance.

The criteria to be used in this evaluation include (but are not limited to) the following:

- Assessing whether or not goals and objectives in the Plan address current and expected conditions,
- Determining if there are any changes in risk factors and/or data that would be relevant to hazards in Sussex County,

- Determining if capabilities have changed relative to the County and municipalities' ability to plan and implement hazard mitigation projects,
- Determining if significant changes have occurred in the availability of funding at federal and state levels to support hazard mitigation planning and implementation, and
- Results in implementing the Plan per monitoring reports.

The Director will prepare a report (1) describing the updated requirements; (2) summarizing the staff evaluation of the Plan, highlighting areas that require updating and explaining the reasons why the updates are needed, and; (3) providing detailed recommendations about how the Plan should be updated, noting any technical work that may be required.

The report will sequentially be provided to the Sussex County Hazard Mitigation Working Group (HMWG) and Sussex County Council (Council) for consideration. The report will also be posted on the County website for public review and comment.

The Sussex County HMWG and the Sussex County Council will review the report and recommendations and advise the Director how to proceed on the individual recommendations for the updates. The Director will initiate activities to carry out the recommendations, and will prepare draft updates to the Plan on a schedule determined in cooperation with the Sussex County HMWG and the Council.

When the draft updates are completed, the Sussex County HMWG will be convened to conduct the comprehensive evaluation and revision. The Sussex County HMWG and Director will produce a final draft of the updated Plan for consideration by the Council. The Council will review the updated Plan, indicate any desired changes, approve and adopt the Plan in sufficient time to meet FEMA requirements.

Plan Amendment Process

Upon the initiation of the amendment process, Sussex County and its municipalities will forward information on the proposed change to all interested parties including, but not limited to, all affected County and municipal departments, residents, and businesses. Information will also be forwarded to DEMA. This information will be disseminated in order to seek input on the proposed amendment for not less than a 45-day review and comment period. If no comments are received from the reviewing parties within the specified review period, such will be noted accordingly.

At the end of the 45-day review and comment period, the proposed amendment and all comments will be forwarded to Hazard Mitigation Working Group for consideration. The HMWG review the proposed amendment along with the comments received from other parties, and submit a recommendation to the appropriate governing body within 60 days.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered:

- Errors or omissions made in the identification of issues or needs during the preparation of the Plan,

- New issues or needs have been identified which were not adequately addressed in the Plan, and
- Changes in information, data, or assumptions from those on which the Plan was based.

Upon receiving the recommendation of the coordinator and the HMWG, the governing body will hold a public hearing. The governing body will review the recommendation (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the governing body will take one of the following actions:

- Adopt the proposed amendment as presented,
- Adopt the proposed amendment with modifications,
- Refer the amendments request back to the designee for further consideration, or
- Defer the amendment request for further consideration and/or hearing.

Update Implementation

Each jurisdiction participating in this Plan is responsible for implementing specific mitigation actions as prescribed in their locally adopted Mitigation Action Plan. In the Mitigation Action Plan, each proposed action is assigned to a specific local department or agency in order to increase accountability and the likelihood of implementation. This approach enables individual jurisdictions to update their unique mitigation strategy as needed without altering the broader focus of the countywide plan elements. The separate adoption of locally specific actions also ensures that each jurisdiction is not held responsible for the actions of every other jurisdiction involved in the planning process.

Each jurisdiction shall develop an updated implementation schedule as part of their local Mitigation Action Plan.

Sussex County and its jurisdictions will seek outside funding sources to implement mitigation projects. Whenever possible, a funding source has been identified for proposed actions listed in the Mitigation Action Plan.

It will be up to each participating jurisdiction to determine additional implementation procedures beyond their Mitigation Action Plan. This includes integrating the requirements of the All Hazard Mitigation Plan into other planning documents, processes or mechanisms such as comprehensive or capital improvement plans, when appropriate.

Other Local Planning Mechanisms

It should be noted that Sussex County has limited land use planning and zoning authority, so the County has few opportunities to incorporate this Plan into other local mechanisms, such as zoning and subdivision ordinances, or comprehensive land use plans. SCEOC will work with individual municipalities to incorporate the recommendations of the Plan into local comprehensive planning and capital improvement programs.

Plan Monitoring And Maintenance

Participating municipalities in this Plan will work to incorporate the goals of this Plan into the next update of relevant plans and regulations, including comprehensive plans, zoning codes, and capital improvement plans.

Continued Public Involvement

Efforts to obtain public input were an integral part of the Plan Update and will continue to be essential as this Plan changes over time. As is the case with any officially adopted plan or ordinance, significant changes to this Plan shall require a public hearing.

Other efforts to involve the public in the maintenance, evaluation and revision process will be made as necessary. These efforts may include:

- Advertising meetings of the Hazard Mitigation Working Group in the local newspaper, public bulletin boards and/or City and County office buildings,
- Utilizing local media to update the public of any maintenance and/or periodic review activities taking place,
- Utilizing City and County Web sites to advertise any maintenance and/or periodic review activities taking place, and
- Keeping copies of the updated Plan in public libraries.

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ANNEX A: MUNICIPAL MITIGATION ASSESSMENTS

Individual Jurisdiction Section Overview

Due to the nature of the multi-jurisdiction plan and the government structure within the State of Delaware, each jurisdiction has an individual section in the plan. Each section outlines background, capabilities, risk assessment, and mitigation actions for the respective jurisdiction and the status of all previously identified mitigation actions. The mitigation actions are designed to complement the County-wide risk assessment while allowing the municipalities to provide any changes to hazards based on local impact.

Repetitive and Severe Repetitive loss properties

The listing of repetitive loss and severe repetitive loss properties as denoted by the National Flood Insurance program are split out among the municipal sections based on where the property resides. Every property is included as a mitigation action for their respective municipality and is denoted as being one of those properties unless the jurisdiction specifically declined to pursue mitigation actions to these properties. During the plan update process, each community's repetitive loss properties were identified. The majority of the communities have declined to attempt mitigation actions citing staff and funding as major obstacles.

Mitigation Action Plan

The mitigation actions outlined below are not prioritized within this plan. Instead, as funding and staff time become available, the actions are reviewed to determine which action is the most feasible. The decision on which mitigation measures at the County level will be made by the Director of the Emergency Operations Center, or designee. Potential funding sources are outlined next to each mitigation action in the tables.

Criteria that are used in determining which mitigation action to pursue include:

- Funding and/or time available,
- Restrictions on allowed use of the funding,
- Number of mitigation goals met,
- Cost benefit review of the action,
- Ability of agencies involved to work on the action, and
- Ability for the County/municipality to administer the mitigation action.

Sussex County General

Profile

Sussex County is the largest County in Delaware encompassing 1,196 square miles. The majority of Delaware beaches are located in the eastern portion of the state. Adjacent Counties are Kent County Delaware to the north, Cape May County New Jersey to the northeast, Worcester County Maryland to the south, Dorchester County Maryland to the southwest, Wicomico County Maryland to the

southwest, and Caroline County Maryland to the northwest.

According to the 2010 Census, the County population is 197,145 residents.

There are three major north south highways within Sussex; US Route 13 in the west, US Route 113 in the middle, and State Route 1 along the coast.

Agriculture and commercial fishing drive Sussex County. The predominant economic driver in the state is agriculture with the largest poultry production within the United States. Most of the land is rural and there are but a few large population centers.

Unincorporated Land

Areas such as Mallard Lakes, an unincorporated area of the county, have expressed a concern via public comment regarding the repair of the flooding of 4 units within the development boundaries.

There is evidence of flooding and substantial impact from events such as Hurricane Sandy. However, efforts to secure Hazard mitigation assistance previously have not been successful. It is recommended that the County work with the Homeowners Association in securing funding to conduct a study of the repetitive flooding concerns and what measures can be taken by the homeowners association to mitigate potential harm. This potential mitigation action is included within the Sussex County Mitigation Strategy section of the plan update.

Repetitive Loss & Severe Repetitive Loss Properties

Every community participating in the mitigation plan update was interviewed concerning past losses, significant local hazard types, areas of concern, types of mitigation activities available, the process to access those activities. Of special note were the repetitive loss and severe repetitive loss properties within their respective communities. Acquisition, Elevation, Relocation projects were discussed and encouraged. Every community declined to address these repetitive loss properties with potential mitigation activities citing owner interest was not favorable. This lack of interest seems to stem from the seasonal nature and relative value of the structures.

Risk Assessment

Sussex County considers their top hazards to be flooding, wind related events and winter storms, drought, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Sussex County	x	x	x	x		x		x	x	x	x	x	x	x	x	x	x		x

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan

- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdiction's have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
N/A	N/A

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Sussex County	8

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Sussex County	10/06/76

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
N/A	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Sussex County	M	M	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
Assigned to Municipalities			
Severe Repetitive Loss Properties			
Assigned to Municipalities			

Mitigation Actions Review

Sussex County & Unincorporated Areas Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Work with DelDOT to improve all emergency access routes throughout the County.	Flood	Short-term	Ongoing	Director Public Works	FMA, HMGP, PDM	TBD
2	Improve the County's Community Rating System rating. Review and update community plans and ordinances and incorporate updated information into the CRS update.	Flood	Short-term	Ongoing	County Administrator	FMA, HMGP, PDM	Administrative costs
3	Assist residents with compliance with building codes requiring residents to elevate manufactured housing located on the coast to above the base flood elevation (BFE).	Flood	Ongoing	Ongoing	County Building Inspector, County Administrator	FMA, HMGP, PDM	Administrative costs
4	Work with homeowners to identify ways to elevate flood-prone structures.	Flood	Ongoing	Ongoing	Director of the Emergency Operations Center	FMA, HMGP, PDM	Administrative costs
5	Improve educational awareness through better notifications, training, and properly marked flood evacuation routes.	Flood	Short-term	Ongoing	Director of the Emergency Operations Center	FMA, HMGP, PDM	50,000
6	Standardize Response Levels Plan and rewrite Emergency Operations Plan.	All	Short-term	In Progress	Director of the Emergency Operations Center	CDBG, PS, HSGP	Administrative costs
7	Construct four-lane East/West emergency evacuation route to Maryland toll road (Routes 918 and 404).	All	Short-term	Not started	Director Public Works	CDBG, PS, HSGP	TBD
8	Distribute disaster preparedness and hazard mitigation-related information using brochures and website link.	All	Ongoing	Ongoing	Director of the Emergency Operations Center	FMA, HMGP, PDM, CDBG	1,200
9	Work with DelDOT to install storm drain of culvert on 1100 Block of South Bayshore Drive in Broadkill Beach.	Flood	Short-term	Not started	Director Public Works	FMA, HMGP, PDM	750,00
10	Work with DNREC and DelDOT to endorse Federally funded restoration projects to restore portions of the Sussex County coastline that are experiencing significant coastal erosion, both from rising sea levels and coastal storms.	Coastal Erosion	Ongoing	Ongoing	Director Public Works	CDBG, PS, HSGP	Administrative costs
11	Work with DNREC to explore ways to finance beach restoration projects in private communities that are experiencing significant coastal erosion, both from rising sea levels and coastal storms.	Coastal Erosion	Short-term	Not started	County Administrator	UACE	Administrative costs

Sussex County & Unincorporated Areas Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
12	Develop a close working relationship between the county EOC and public utility companies. Identify a staff person from the utility companies to serve as a liaison to the County EOC for the inclusion of utility issues with emergency planning.	All	Short-term	Not started	Director of the Emergency Operations Center	CDBG, PS, HSGP	Administrative costs
13	Work closely with unincorporated places, major subdivisions, and beach communities like Broadkill and Prime Hook, and manufactured home parks to more accurately allocate resources and plan for hazard mitigation, evacuation, etc. and make them more inclusive in the planning process.	All	Ongoing	Not started	Director of the Emergency Operations Center	FMA, HMGP, PDM, CDBG	Administration costs
14	Conduct a study to identify storm-water management systems that need to be retrofitted and channels that need to be improved in order to reduce flooding throughout the County.	Flood	Short-term	Not started	Director of the Emergency Operations Center	FMA, HMGP, PDM	100,000
15	Work with DelDOT to identify possible elevation alternatives for the rebuilding of SR 38 (Prime Hook Road).	Flood	Short-term	Ongoing	Director Public Works	HMGP, CDBG, PS	1.45 million
16	3 Repetitive Loss Property elevations	Flood	Ongoing	Ongoing	Director of the Emergency Operations Center	HMGP	300,000
17	Support additional Flood Management Study and/or Potential Elevations in the Mallard Lakes area.	Flood	Short term	Pending grant funding	Director of the Emergency Operations Center	FMA, HMGP, PDM	2 million
!8	Work with University of Delaware and DEMA to develop a comprehensive database of critical facilities for all jurisdictions to include geo-location and event impacts.	All	Short term	Pending grant funding	Director of the Emergency Operations Center	FMA, HMGP, PDM	250,00
19	Conduct a HAZUS run incorporating expanded data sets from mitigation action 18.	All	Short term	Pending grant funding	Director of the Emergency Operations Center	FMA, HMGP, PDM	150,00
20	Increase the county GIS capability to enable more detailed hazard specific overlay mapping to better address vulnerabilities to the county and jurisdictions.	All	Short term	Pending grant funding	Director of the Emergency Operations Center	FMA, HMGP, PDM	150,00
21	Actively pursue mitigation of Repetitive and Severe Repetitive Loss properties within the county and local jurisdictions.	Flood	Short term	Pending grant funding	Director of the Emergency Operations Center	FMA, HMGP, PDM	500,000
22	Review existing building codes to ensure compliance with new construction elevation and flood related best practices and mandates.	Flood	Short term	Pending grant funding	Floodplain Administrator	HMGP, CDBG, PS	Administration costs

Under timeline for completion, the County has identified the following parameters:

- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

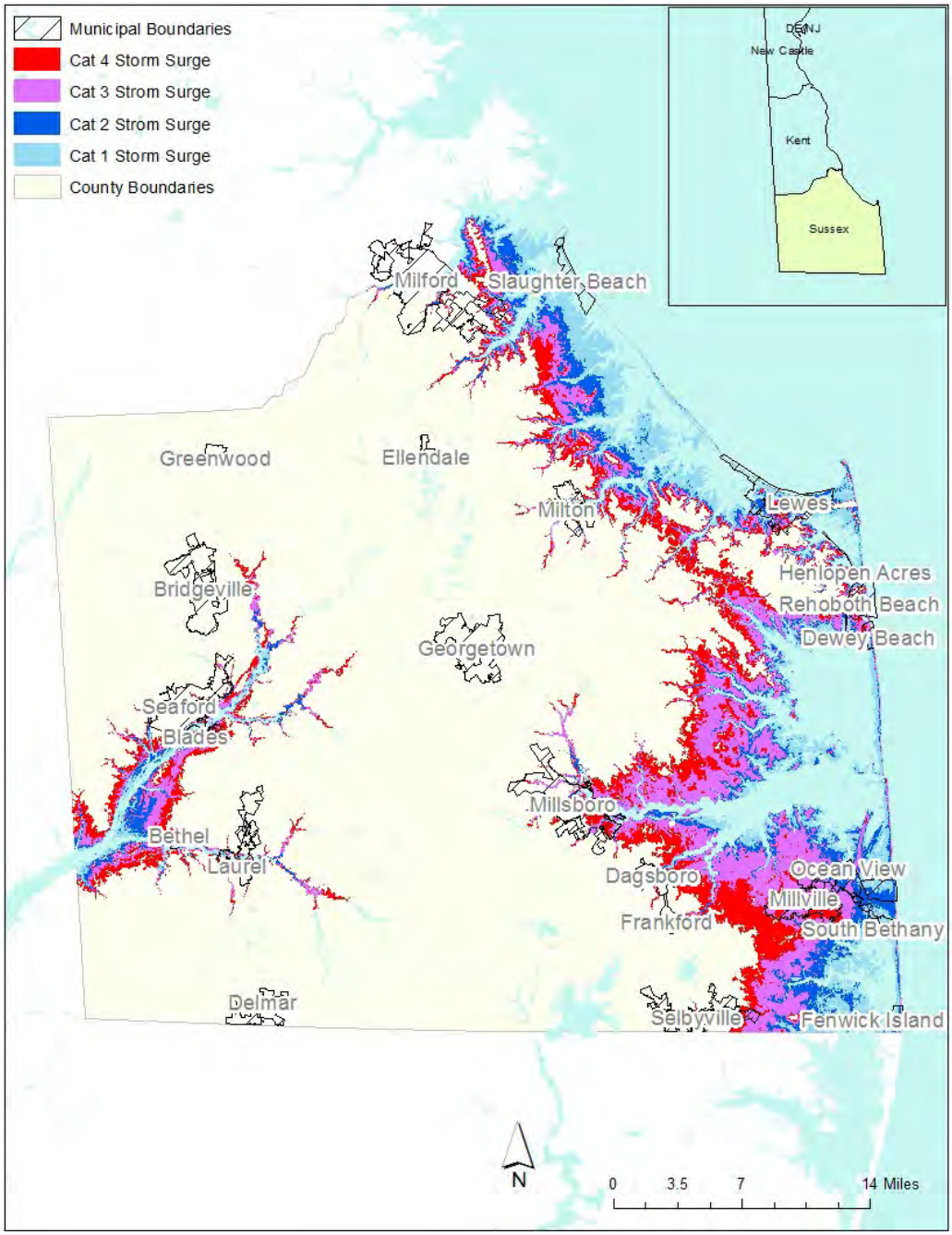
Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Sussex County & Unincorporated Areas Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1				✓	
2		✓			
3		✓			
4		✓			
5		✓			
6				✓	
7				✓	
8		✓			
9		✓			
10		✓			
11				✓	
12				✓	
13				✓	
14		✓			

Sussex County & Unincorporated Areas Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
15		✓			
16			✓		
17			✓		
18			✓		
19			✓		
20			✓		
21			✓		
22			✓		

Figure A-1: County Flood Inundation Map



Town of Bethany Beach

General Profile

The Town of Bethany Beach encompasses 1.2 square miles. The Delaware Seashore State Park, the Atlantic Ocean to the east, the Town of South Bethany to the south, and the City of Ocean View to the west border the town to the north.

According to the 2010 Census, the population of the Town of Bethany Beach is 1,060 but will swell to over 20,000 during the summer vacation season.

The Bethany Beach economy centers on the tourism and vacation industry. Agriculture and commercial fishing drive Sussex County.

Risk Assessment

The Town of Bethany Beach considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Bethany Beach	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Bethany Beach	**2010**

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Bethany Beach	***Declined Participation***

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Bethany Beach	**4/06/73**

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Bethany Beach	**5/1/09**	**8**

B-5 Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Bethany Beach	**M**	**M**	**M**

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
Town of Bethany Beach	1	7	$394,376
Town of Bethany Beach	1	5	$110,440

Mitigation Actions Review

Town of Bethany Beach Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Improve existing drainage system throughout the Town, particularly east of Route 1 and also include a plan maintenance schedule.	Flooding	Long term	In Progress	Public Works Director	HMGP, FMA, PDM, PS	3.5 Million
2	Consider purchasing an inflatable dam for Loop and Assawoman Canal to protect against incoming tide waters.	Flooding	Short term	Delayed due to funding.	Town Manager	HMGP, FMA, PDM, PS	
3	Continue to educate residents and improve public awareness on being better prepared to face hazards.	All	Short term	In Progress	Public Safety Director	HMGP, FMA, PDM, PS, CDBG	1,000
4	Create 2 new outfalls leading from large ditch that runs from Route 26 behind Lake Bethany to the marsh and install flap gates.	Flooding	Short term	Not started	Public Works Director	HMGP, FMA, PDM, PS	
5	Conduct Phase 2 of Bethany West drainage improvements. Replace and upgrade existing storm-water system between Collins Street and Tudor Court along Halfmoon Drive including Tudor Court, Sandstone Court, and Pebble Court	Flooding	Short term	Not started	Public Works Director	HMGP, FMA, PDM, PS	
6	Conduct Phase 3 of Bethany West drainage improvements. Replace and upgrade existing storm-water facilities at West Side Development, enlarge outfall, replace driveway culverts, replace old pipe systems, re-grade ditches.	Flooding	Short term	Not started	Public Works Director	HMGP, FMA, PDM, PS	
7	Storm water runoff on Pennsylvania Ave from Garfield to 5th	Flooding	Short term	Pending funding source	Public Safety Director	HMGP	
8	Storm water management at 8th Street and Evans Ave (low lying area	Flooding	Short term	Pending funding source	Public Safety Director	HMGP	

Under timeline for completion, the County has identified the following parameters:

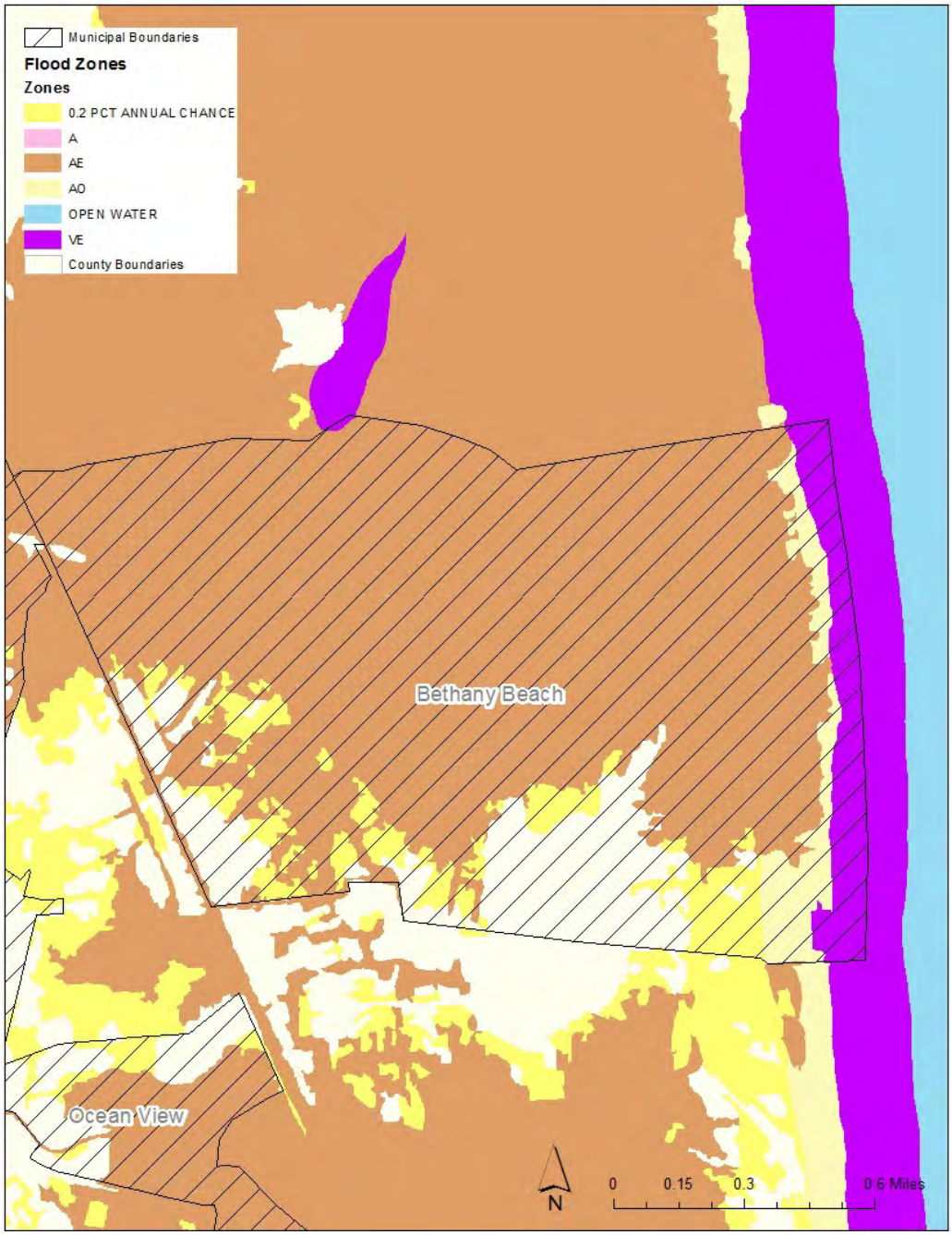
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Bethany Beach Mitigation Actions Status					
ID#	**Completed**	**Carry Over**	**New**	**Removed**	**Comments**
1		✓			
2		✓			
3		✓			
4		✓			
5		✓			
6		✓			
7			✓		
8			✓		

Figure A-2: Bethany Beach Flood Map



Town of Bethel

General Profile

The Town of Bethel is encompasses 0.4 square miles. The town is located on the north bank of the Broad Creek near Laurel.

According to the 2010 Census, the population of the Town of Bethel is 171 permanent residents.

The Bethel economy centers on manufacturing industry support.

Risk Assessment

The Town of Bethel considers their top hazards to be flooding, wind related events, winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Bethel									X			X	X	X		X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Bethel	Contacted

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Bethel	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Bethel	1/16/81

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
N/A	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Bethel	L	L	L

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Bethel Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Educate the public regarding preparedness and protection measures.	All	Ongoing	Pending funding source	Mayor (President)	HMGP, FMA, PDM, CDBG	2,000
2	Review County Office of Emergency Services plans regarding protective measures and evacuation procedures for hazardous materials incidents and share this information with citizens. Information should include ways to elevate and/or harden oil and gas storage tanks to avoid spills and contamination of surrounding areas.	Manmade – Hazardous Materials	Short term	Pending funding source	Mayor (President)	CDBG, HSGP	2,000
3	Educate the public on the necessity of periodic well testing, especially during periods of drought.	Flood Drought	Short term	Pending funding source	Mayor (President)	HMGP, FMA, PDM, CDBG	2,000
4	Educate the public regarding special needs populations in the event of winter storms.	Winter Storm	Short term	Pending funding source	Mayor (President)	HMGP, FMA, PDM, CDBG	2,000
5	Identify shelters and notify the public about their location.	All	12 months	Delayed	Mayor (President)		
6	Educate the public concerning sheltering-in-place should a terrorist attack occur.	Terrorism	Short term	Pending funding source	Mayor (President)	CDBG, HSGP	2,000
7	Identify historic structures and develop mitigation strategies to protect any at-risk properties.	All	Short term	Pending funding source	Mayor (President)	HMGP, FMA, PDM	20,000

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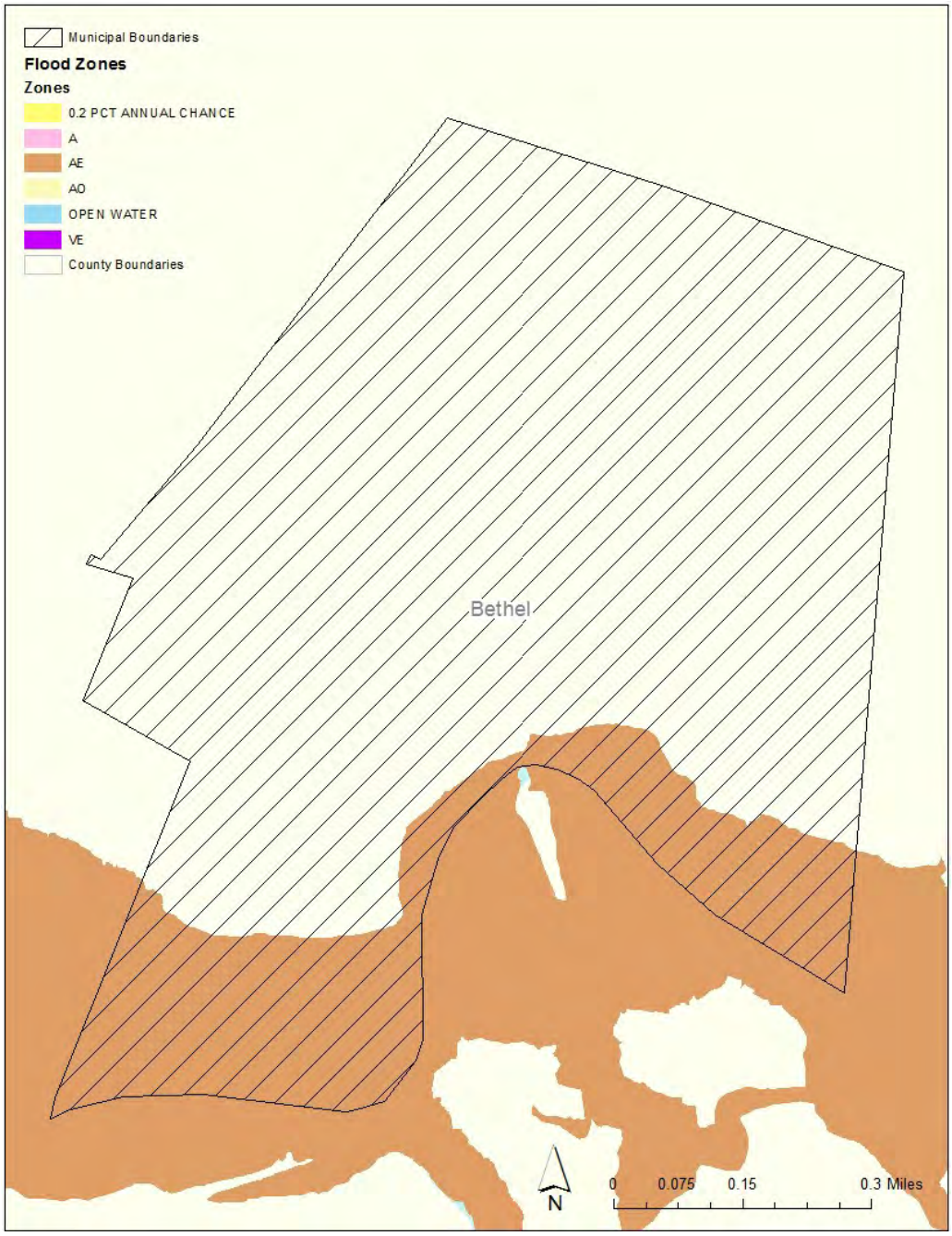
Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Bethel Mitigation Actions Status					
ID#	**Completed**	**Carry Over**	**New**	**Removed**	**Comments**
1		✓			
2		✓			
3		✓			
4		✓			
5		✓			
6		✓			
7		✓			

Figure A-3: Bethel Flood Map



Town of Blades General

Profile

The Town of Blades encompasses 0.4 square miles.

According to the 2010 Census, the population of the Town of Blades is 1241. The

Town of Blades economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Blades considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Blades			X						X					X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Blades	Certified 2008

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Blades	Declined Participation

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Blades	1/16/81

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Blades	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Blades	M	M	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Blades Mitigation Actions							
ID	Mitigation Action	Hazard Addressed	Timeline	Status	Responsible Agency	Potential Funding Sources	Estimated Cost
1	Upgrade storm-water drainage systems with existing underground pipes and outfall areas to help prevent future flooding.	Flood	When funds become available	Delayed	Town Manager	HMGP, FMA, PDM	
2	Install new storm drains in strategic areas to allow removal of standing water during storms.	Flood	When funds become available	Ongoing	Town Manager	HMGP, FMA, PDM	2 million
3	Stormwater management upgrade to Enlarged and improved culverts West 3rd Street (150 ft)	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM	3500
4	Stormwater management upgrade at East 2nd St - East 3rd street - culvert expansion and upgrade (150 ft)	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM	3000
5	Stormwater management for enforcement of building and zoning codes in support of new construction (Fire House)	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM	
6	Stormwater management upgrade at Market Street	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM	500,000
7	Blades storm-water Management Project - 5Phase study	Flood	Short term	Completed	Town Manager	N/A	10,000
8	Blades storm-water Management Project - Phase I - upgrade to culvert along Hollaway Street and West 2nd Street, West High Street	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM	250,000
9	Blades storm-water Management Project - Phases 2 thru 5 are pending	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM	

Under timeline for completion, the County has identified the following parameters:

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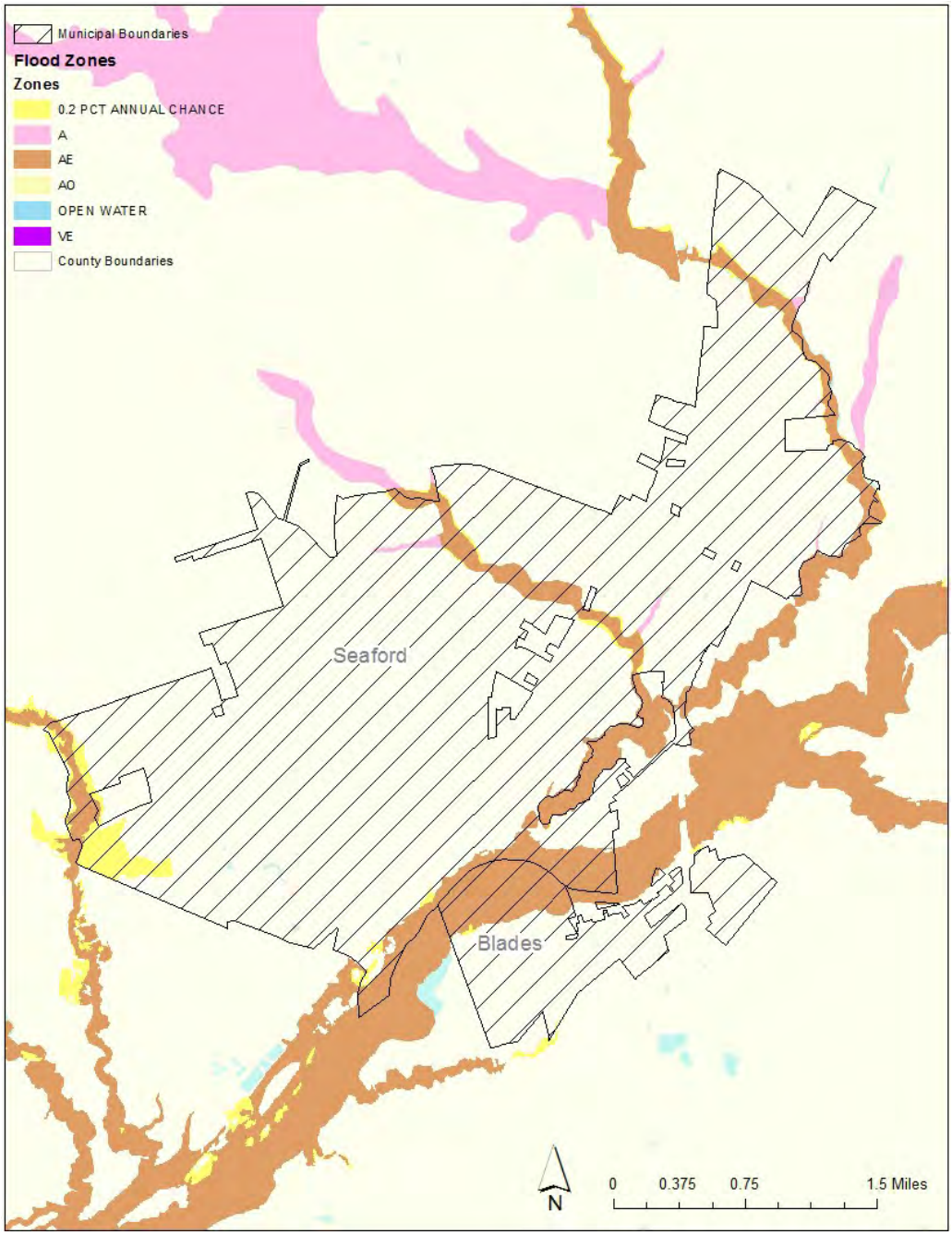
Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Blades Mitigation Actions Status					
ID#	**Completed**	**Carry Over**	**New**	**Removed**	**Comments**
1		✓			
2		✓			
3			✓		
4			✓		
5			✓		
6			✓		
7	✓			✓	
8		✓			
9		✓			

Figure A-4: Blades Flood Map



Town of Bridgeville

General Profile

The Town of Bridgeville is the home to the Apple Scrapple Festival and the World Championship Punkin Chunkin and encompasses 0.8 square miles.

According to the 2010 Census, the population of the Town of Bridgeville is 2,048, but will swell to over 16,000 during the summer vacation season.

Risk Assessment

The Town of Bridgeville considers their top hazards to be wind related events and winter storms.

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Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Bridgeville	X		X	X		X	X	X	X	X	X	X	X	X		X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Bridgeville	2016

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Bridgeville	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Bridgeville	1/7/77

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Bridgeville	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Bridgeville	M	L	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Bridgeville Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Purchase mobile surveillance cameras for town use - protection for possible terrorist threats, drug activity, burglaries, etc.	Terrorism	Short term	Grant pending	Town Manager	HSGP	45,000
2	Currently the police department is housed separate from the other administrative offices in an old building. Relocate the police department and Town offices to one building to increase efficiency.	All	Short term	Architectural plans in place, awaiting funding	Town Manager	CDBG	
3	Security fence at well-house and lift station	Terrorism	Short term	Pending funding	Town Manager	HSGP	50,000
4	Storm water management plan development with replacement timeline	Flood	Short term	Pending funding	Floodplain Administrator	HMGP, FMA, PDM	150,000

Under timeline for completion, the County has identified the following parameters:

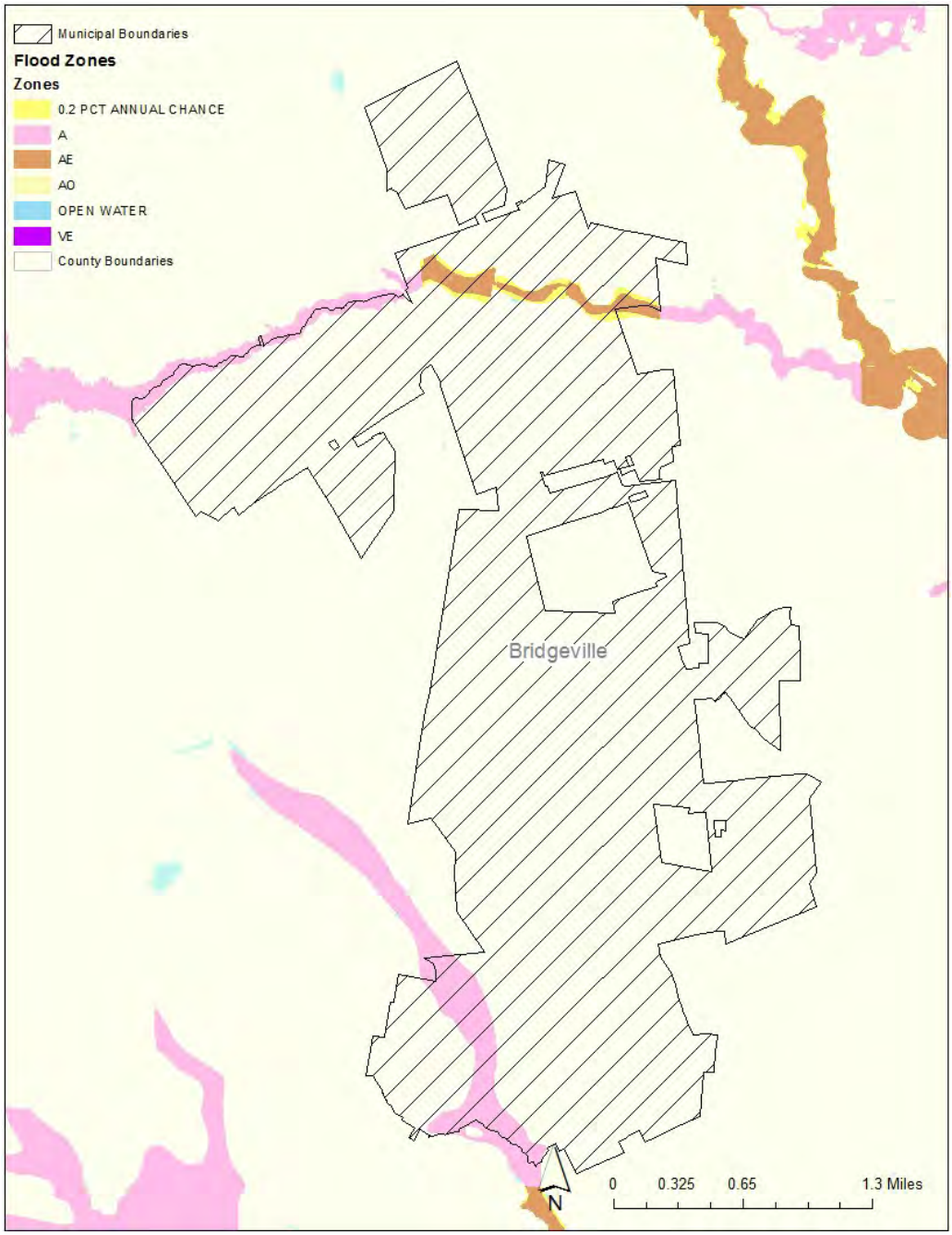
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Bridgeville Mitigation Actions Status					
ID#	**Completed**	**Carry Over**	**New**	**Removed**	**Comments**
1		✓			
2		✓			
3		✓			
4		✓			

Figure A-5: Bridgeville Flood Map



Town of Dagsboro

General Profile

The Town of Dagsboro encompasses 1.3 square miles.

According to the 2010 Census, the population of the Town of Dagsboro is 805. The

Town of Dagsboro economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Dagsboro considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Dagsboro			X						X		X	X		X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Dagsboro	Certified (2003

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Dagsboro	*Declined Participation*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Dagsboro	6/1/81

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Dagsboro	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Dagsboro	L	L	L

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Dagsboro Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	In coordination with Sussex County, fully participate in public outreach programs designed to promote hazard education and awareness for residents and businesses.	All	Ongoing	Delayed	Town Manager	HMGP, FMA, PDM	1,200

Under timeline for completion, the County has identified the following parameters:

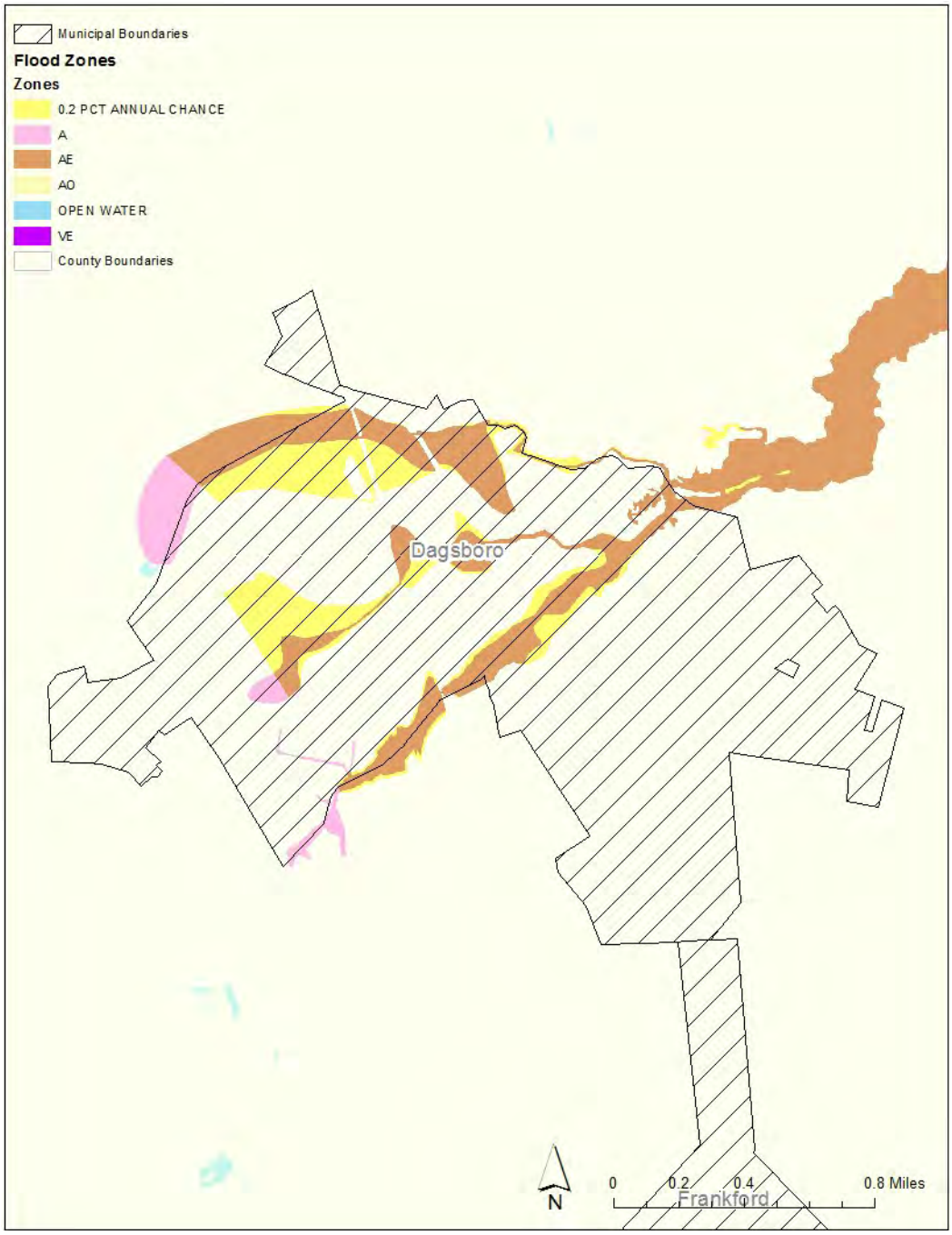
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Dagsboro Mitigation Actions Status					
ID#	**Completed**	**Carry Over**	**New**	**Removed**	**Comments**
1		✓			

Figure A-6: Dagsboro Flood Map



Town of Delmar General

Profile

The Town of Delmar is located on the Maryland State border and encompasses 0.9 square miles. The town is mirrored by its twin city of Delmar Maryland.

According to the 2010 Census, the population of the Town of Delmar is 1597 (Delaware side only. Combined with the Maryland Delmar, the population is 4,600.

Risk Assessment

The Town of Delmar considers their top hazards to be wind related events and winter storms.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Delmar			X			X	X		X	X	X			X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Delmar	Complete (2010)

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Delmar	*Not Evaluated*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Delmar	2/27/07

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Delmar	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Delmar	L	L	L

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Delmar Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Conduct a vulnerability assessment of wastewater and storm-water management systems throughout the Town.	Flood	Short term	Pending funding source	Public Works Director	HMGP, FMA, PDM, CDBG	10,000
2	Develop an Emergency Operations Plan to include identifying additional local hazards.	All	Short term	Pending funding source	Town Manager	CDBG, HSGP	2,000
3	Develop a disaster recovery plan	All	Short term	Pending funding source	Town Manager	CDBG, HSGP	2,000
4	Community outreach program development to include web based preparedness.	All	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM, CDBG	2,500
5	GPS tracking for snow removal vehicles	Winter Storm	Short term	Pending funding source	Public Works Director	CDBG, HSGP, PS	3.500

Under timeline for completion, the County has identified the following parameters:

- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Delmar Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1		✓			
2		✓			
3			✓		
4			✓		
5			✓		

Dewey Beach General

Profile

The Town of Dewey Beach is a coastal town that encompasses 0.3 square miles.

According to the 2010 Census, the population of the Town of Dewey Beach is 341. The

Town of Dewey Beach economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Dewey Beach considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Dewey Beach			x	x					x			x		x	x	x	x	x	x

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Dewey Beach	In Progress

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Dewey Beach	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Dewey Beach	6/18/82

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Dewey Beach	10/1/94	8

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Dewey Beach	H	H	L

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
Dewey Beach	1	5	$211,718
Dewey Beach	1	4	$64,997

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Dewey Beach	1	4	$84,004

Mitigation Actions Review

Town of Dewey Beach Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Develop a Disaster Warning System to notify the community of an impending disaster.	All	Short term	Not started	Town Manager	HMGP, FMA, PDM, CDBG	500,000
2	Consider reconstructing the Rehoboth Bay shoreline which has been eroded due to heavy flooding from seawater and drainage from Nor' Easter storms.	Coastal Erosion	Short term	Not started	Town Manager	HMGP, FMA, PDM, USACE	1 million
3	Prepare and stock handouts of what to do in case of a disaster.	All	Short term	Not started	Town Manager	HMGP, FMA, PDM, CDBG	1,500
4	Prepare an update to the Town's Emergency Operation Plan.	All	Short term	Not started	Town Manager	CDBG, HSGP	25,000

Under timeline for completion, the County has identified the following parameters:

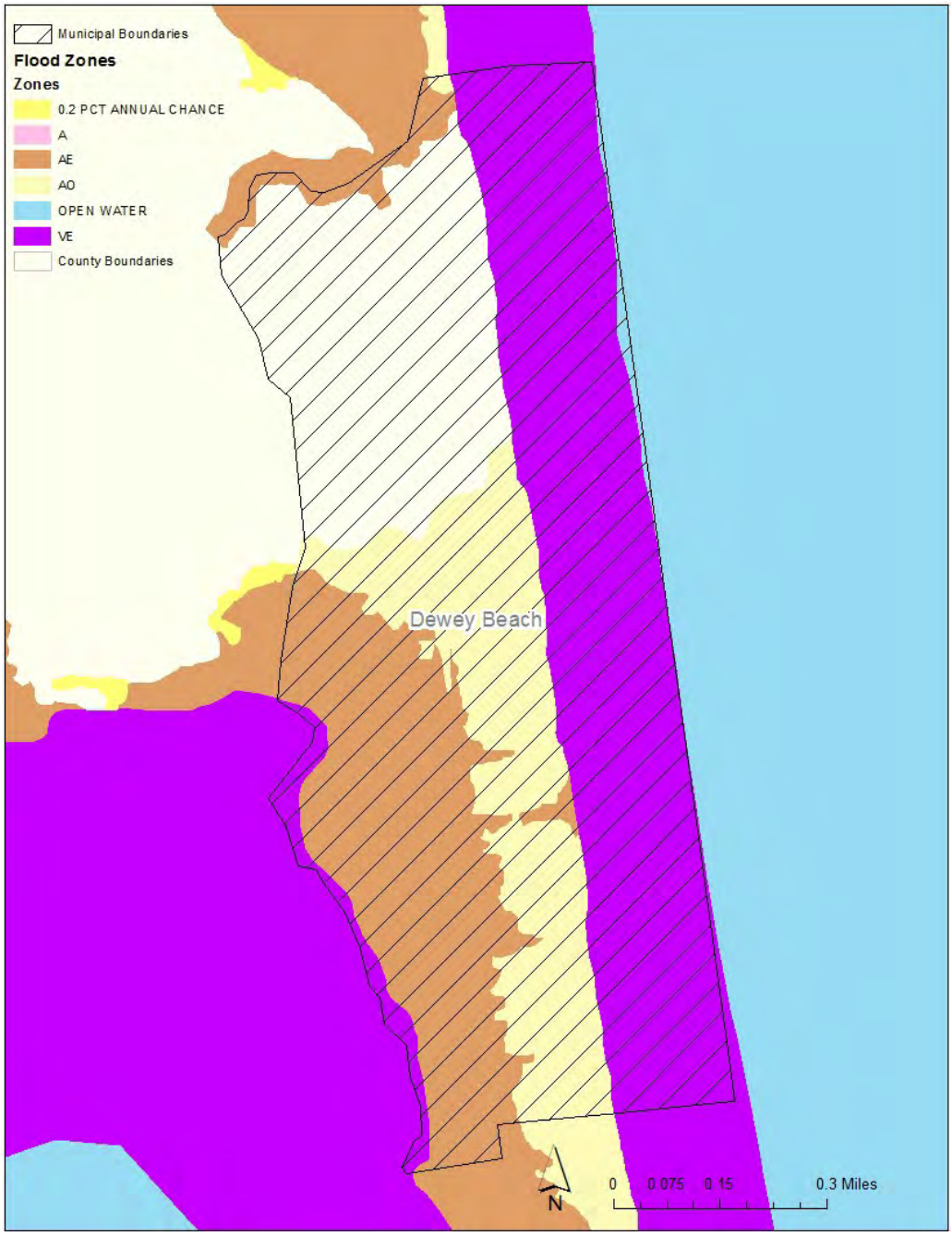
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Dewey Beach Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1		✓			
2		✓			
3		✓			
4		✓			

Figure A-7: Dewey Beach Flood Map



Town of Ellendale

General Profile

The Town of Ellendale is the Gateway to Delaware's Resort Beaches and encompasses 0.3 square miles.

According to the 2010 Census, the population of the Town of Ellendale is 381.

The Town of Ellendale economy centers on the rail hub located there and the health care industry.

Risk Assessment

The Town of Ellendale considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Ellendale			X						X					X	X				X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Ellendale	2009

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Ellendale	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Ellendale	4/19/11

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Ellendale	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Ellendale	L	L	L

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Ellendale Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Develop an Emergency Transportation Plan for the Town that addresses Route 16 and the railroad crossing through the Town. Identify what other evacuation routes are available if Route 16 is closed due to a railroad problem.	All	Short term	Pending funding source	Mayor	CDBG, HSGP	
2	Evaluate the Town's storm drainage systems to identify problem areas.	Flood	Short term	Pending funding source	Mayor	HMGP, FMA, PDM	20,000
3	Continue to educate residents and improve public awareness on being better prepared to face hazards.	All	Ongoing	Not started	Mayor	Self-funding	1,000

Under timeline for completion, the County has identified the following parameters:

- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Ellendale Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1				✓	
2		✓			
3		✓			

Town of Fenwick Island General

Profile

The Town of Fenwick Island is directly across from Ocean City Maryland and encompasses 0.5 square miles. The town does not sit on a barrier island but on a narrow peninsula which resembles a barrier island.

According to the 2010 Census, the population of the Town of Fenwick Island is 379 but will swell to over 5,000 during the summer season.

The Town of Fenwick Island economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Fenwick Island considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Fenwick Island	X		X	X	X	X			X		X	X		X	X	X	X	X	X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Fenwick Island	2011 Update, 2016 Update In-Progress

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Fenwick Island	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Fenwick Island	3/23/73

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Fenwick Island	10/1/94	8

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Fenwick Island	M	M	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
Fenwick Island	1	2	$57,259
	1	2	$57,877
Severe Repetitive Loss Properties			
Fenwick Island	1	4	$60,185

Mitigation Actions Review

Town of Fenwick Island Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Continue retrofitting drainage system and back water valves.	Flood	Short term	phase 2 continuing.	Public Works Director	HMGP, FMA, PDM	45,000
2	Educate property owners of water runoff-to bulkhead should be the responsibility of the homeowner.	Flood	Ongoing	Continuing	Mayor	N/A	administrative
3	Adopt a storm-water management ordinance that regulates private property water runoff.	Flood	Ongoing	Completed	Mayor	Self-funding	2,500
4	Re-grade street ends at intersections along Bunting Avenue to direct the flow of water towards Coastal Highway.	Flood	Short term	Completed	Public Works Director	HMGP, FMA, PDM	55,000
5	West Dagsboro Street upgrade and improvement of storm-water management culverts - 1000 ft	Flood	N/A	Completed	Public Works Director	N/A	130,000
6	North Schultz Road upgrade and improvement of storm-water management culverts - 40 ft	Flood	N/A	Completed	Public Works Director	N/A	50,00
7	Bay Street upgrade and improvement of storm-water management culverts - 500 ft	Flood	N/A	Completed	Mayor	N/A	65,000
8	1 NFIP House Elevations	Flood	N/A	ongoing	Public Works Director	N/A	62,000
9	Implemented freeboard into zoning ordinance	Flood	N/A	Completed	Building Official/Code Enforcement	N/A	Self-funding
10	Upgrade Bayside row drainage and run off	Flood	Short term	Pending funding source	Public Works Director	HMGP, FMA, PDM	60,000
11	Develop disaster preparedness outreach program	All	Short term	Awaiting staff and opportunity	Mayor	HMGP, FMA, PDM	2,000

Under timeline for completion, the County has identified the following parameters:

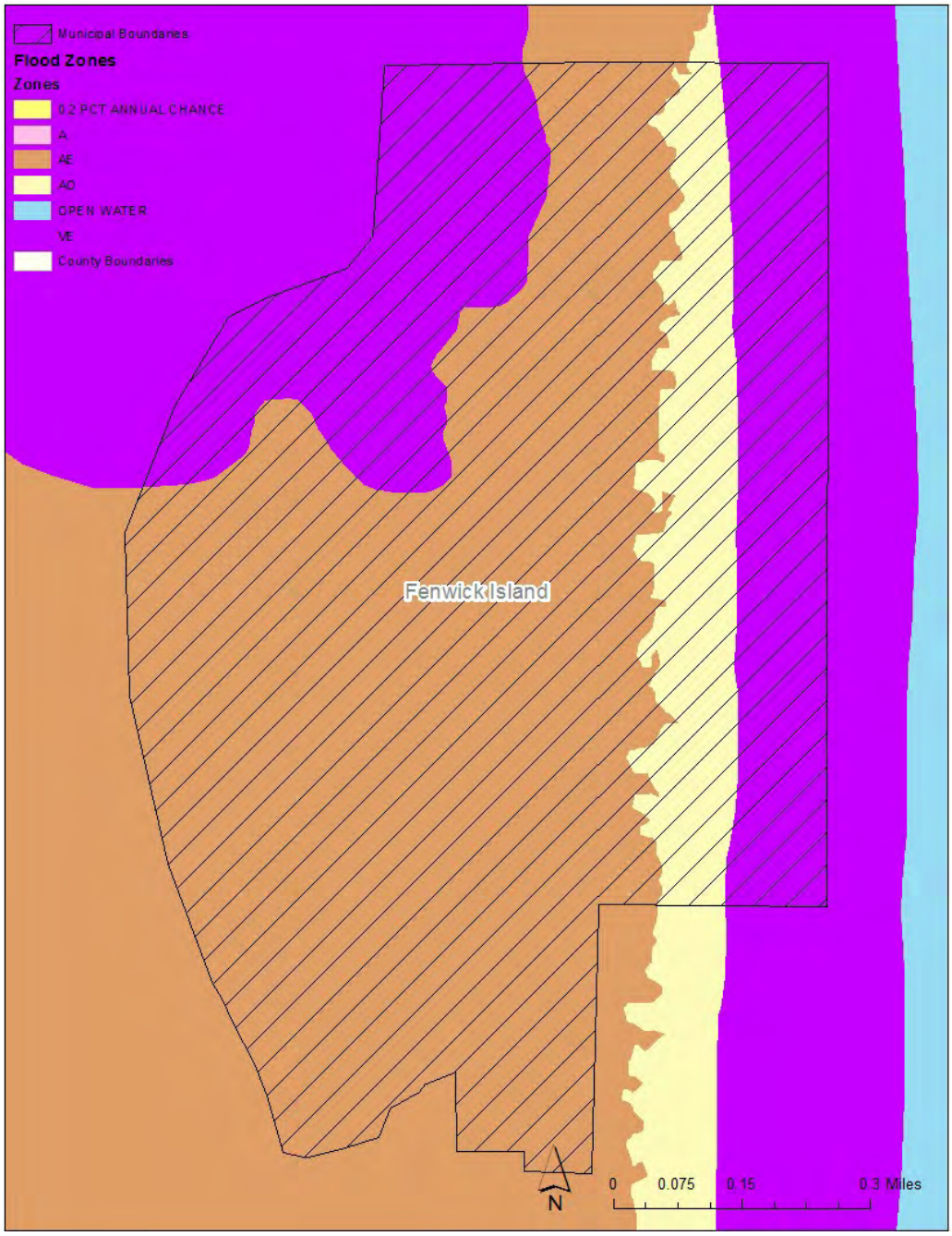
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Fenwick Island Mitigation Actions Status					
ID#	**Completed**	**Carry Over**	**New**	**Removed**	**Comments**
1	✓	✓			phase 1 complete, phase 2 continuing.
2		✓			
3	✓				
4	✓				
5	✓		✓		
6	✓		✓		
7	✓		✓		
8	✓				
9		✓	✓		
10			✓		

Figure A-8: Fenwick Island Flood Map



Town of Frankford

General Profile

The Town of Frankford is located on US Route 113 and encompasses 0.7 square miles.

According to the 2010 Census, the population of the Town of Frankford is 847. The

Town of Frankford economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Frankford considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Frankford			X	X					X		X			X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Frankford	Complete (2009)

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Frankford	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Frankford	9/16/81

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Frankford	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Frankford	M	L	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Town of Frankford Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Identify private and county owned ditches, determine drainage patterns and what should be done to reduce flood related impacts.	Flood	Short term	Delayed	Public Works Council	HMGP, FMA, PDM	50,000
2	Conduct storm-water drainage assessment for the Town.	Flood	Short term	Delayed	Public Works Council	HMGP, FMA, PDM	40,000
3	Create and distribute material targeted to Frankford residents to include contact numbers and "What to do in the event of information.	All	As funds become available	Not started	Town Manager	HMGP, FMA, PDM, CDBG	1,200
4	Update the county's web page to address emergency contact information for individuals and departments specific to the Town of Frankford.	All	As funds become available	Not started	Town Manager	N/A	Administrative costs

Under timeline for completion, the County has identified the following parameters:

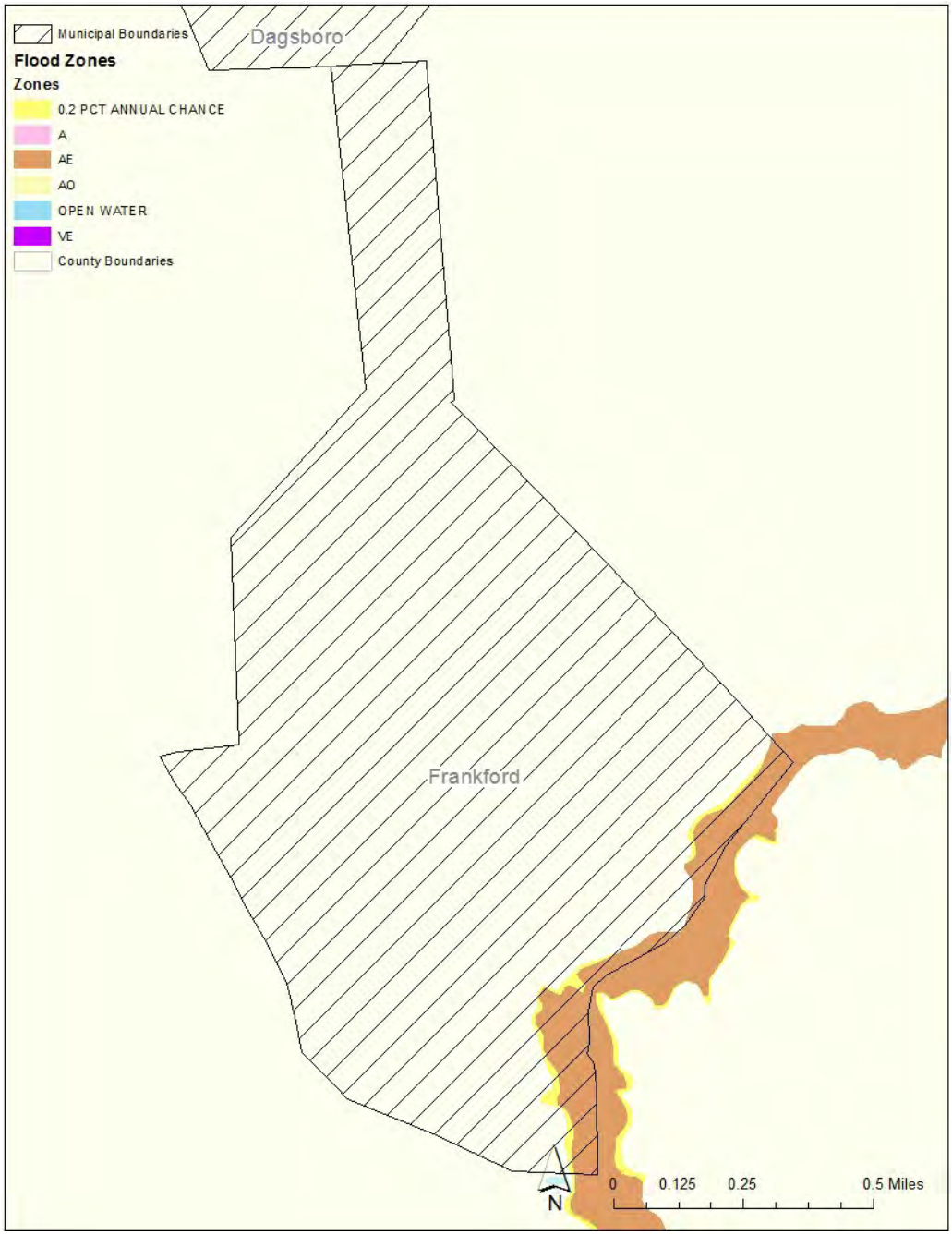
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Frankford Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1		✓			
2		✓			
3		✓			
4		✓			

Figure A-9: Frankford Flood Map



Town of Georgetown General

Profile

The Town of Georgetown is the county seat of government and encompasses 4.1 square miles.

According to the 2010 Census, the population of the Town of Georgetown is 6,422.

The Town of Georgetown economy centers on the poultry industry that surrounds the area.

Risk Assessment

The Town of Town of Georgetown considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Georgetown			X	X					X		X	X		X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Georgetown	Certified (2010)

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Georgetown	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Georgetown	5/5/03

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Georgetown	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Georgetown	L	M	L

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Georgetown Mitigation Actions							
ID	Mitigation Action	Hazard Addressed	Timeline	Status	Responsible Agency	Potential Funding Sources	Estimated Cost
1	Develop an Emergency transportation plan that addresses railroad activity on both sides of the tracks.	Hazardous Materials	Short term	Pending funding source	Public Works Director	HMGP, CDBG, HSGP	
2	Develop a Continuity of Government Plan.	All	Short term	Pending funding source	Town Manager	CDBG, HSGP	
3	Establish critical facility emergency back-up power (police and fire stations).	All	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM	45,000
4	Install or provide portable back-up pumps for wastewater treatment facility (bypass pump).	Flood	Short term	Pending funding source	Public Works Director	CDBG, HSGP	
5	Develop a brochure for the public dealing with emergency situations.	All	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM	1,500
6	Develop emergency generator back-up capability for production and distribution of potable water.	All	Short term	Pending funding source	Public Works Director	HMGP	
7	Develop corrective actions for Route 9, Route 113 and Route 18/404 that tend to bottleneck during the evacuation of residents, college students and transients.	All	Short term	Pending funding source	Public Works Director	CDBG, HSGP	15,000
8	Tree cutback/trimming to clear power lines to protect against wind related tree impacts to said power lines	High Winds	N/A	complete	Public Works Director	N/A	N/A
9	Hurricane Info outreach education program (multi-lingual)	Hurricane	Short term	Pending	Town Manager	HMGP, FMA, PDM	2,500
10	Hazard related warning system	All	Short term	Pending	Town Manager	HMGP, FMA, PDM	15,000

Under timeline for completion, the County has identified the following parameters:

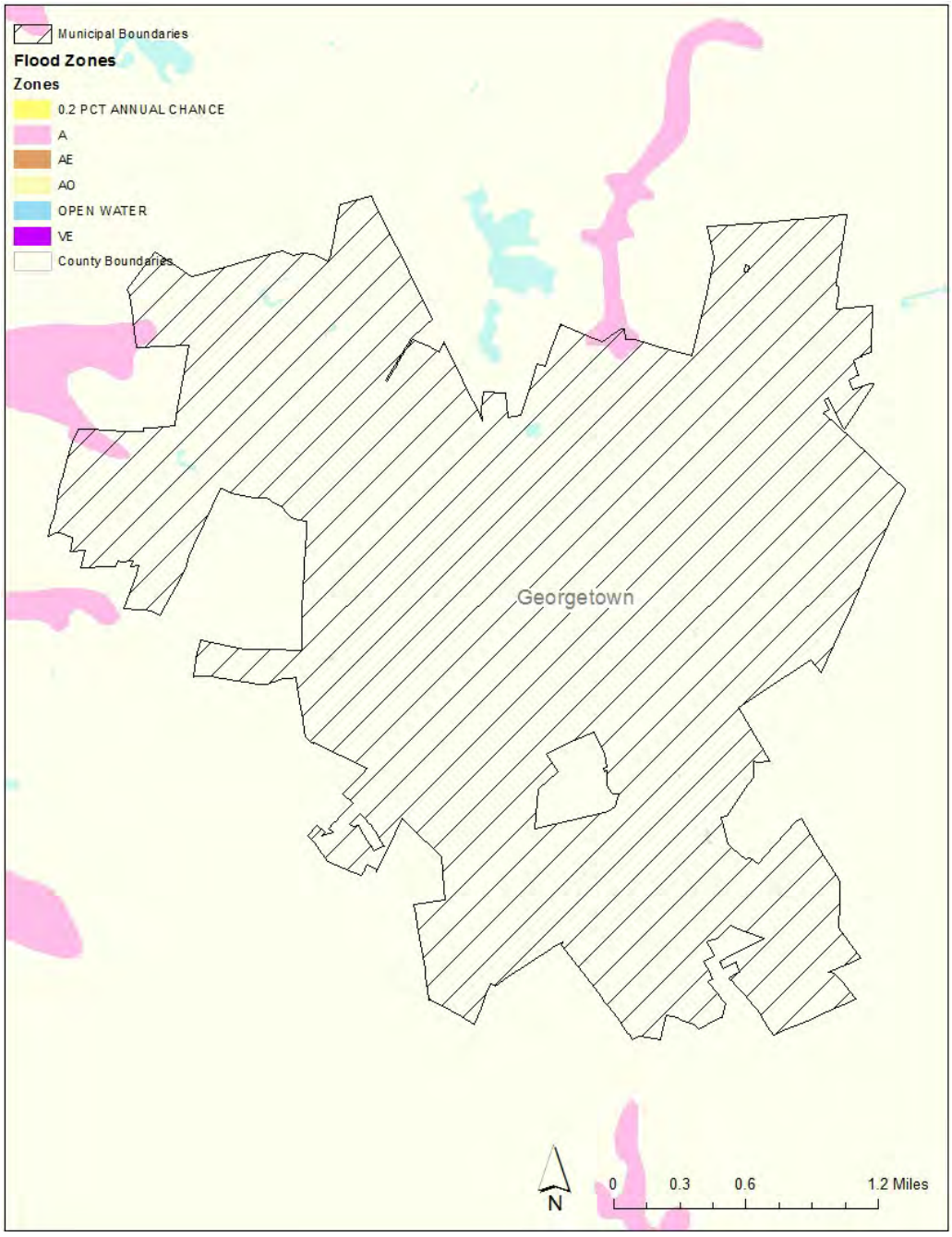
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Georgetown Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1				✓	
2				✓	
3		✓			
4	✓				
5		✓			
6				✓	
7		✓			
8			✓		
9			✓		
10			✓		

Figure A-10: Georgetown Flood Map



Town of Greenwood

General Profile

The Town of Greenwood encompasses 0.7 square miles.

According to the 2010 Census, the population of the Town of Greenwood is 973.

Risk Assessment

The Town of Greenwood considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Greenwood			X	X					X					X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Greenwood	Complete (2013)

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Greenwood	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Greenwood	2/24/78

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Greenwood	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Greenwood	M	M	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Greenwood Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Dredge Cart Branch ditch.	Flood	Short term	Complete	Town Manager	N/A	$750,000
2	Market Street (Addix Ave) storm water management upgrade, piping diameter upgrades (increase) to facilitate run off flow.	Flood	Long term	Pending funding source	Town Manager	HMGP, FMA, PDM	$500,00
3	Market & Sussex storm water management upgrade, piping diameter up-grades (increase) to facilitate run off flow.	Flood	Long term	Pending funding source	Town Manager	HMGP, FMA, PDM	$500,00

Under timeline for completion, the County has identified the following parameters:

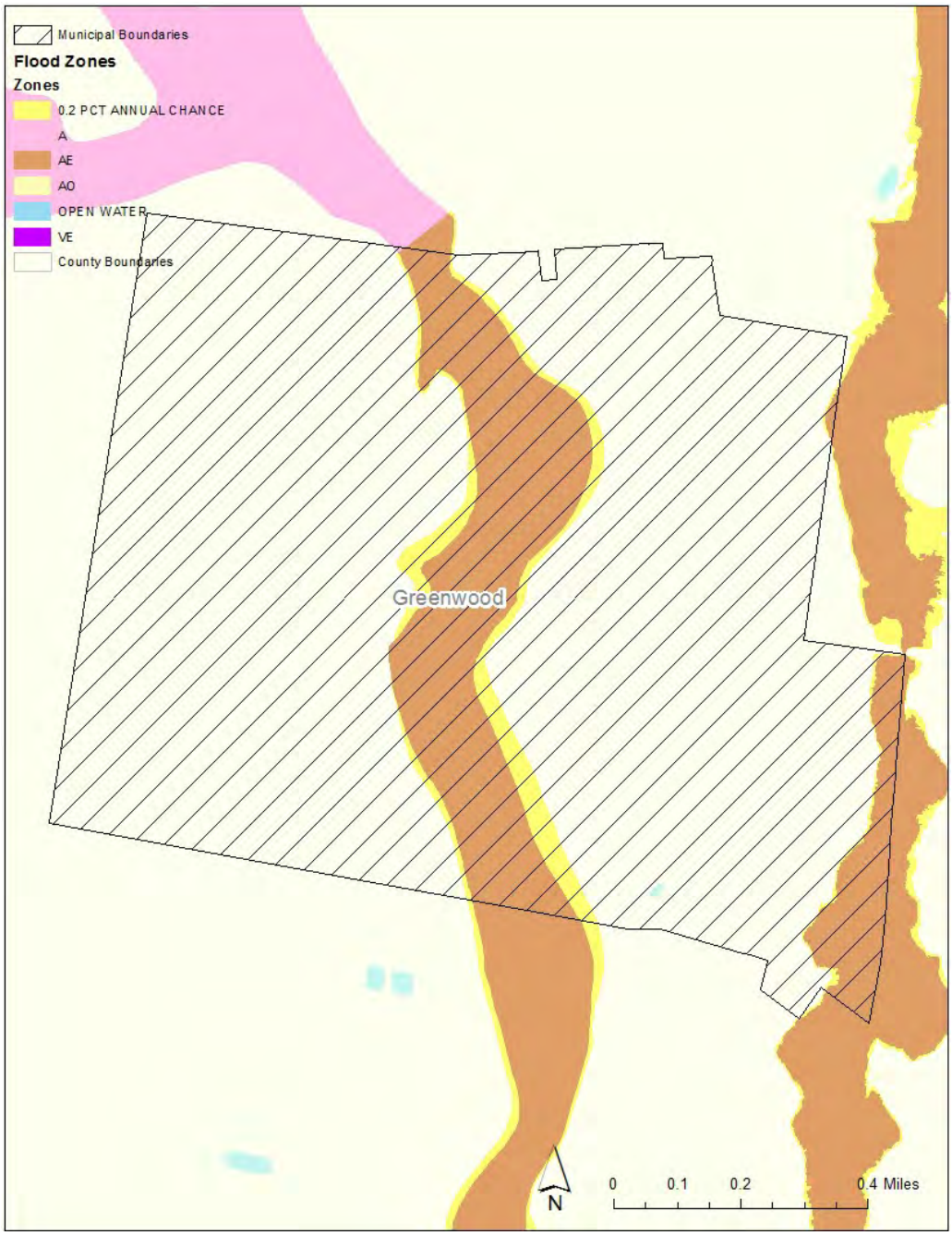
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Greenwood Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1	✓				Complete 2013
2			✓		
3			✓		

Figure A-11: Greenwood Flood Map



Town of Henlopen Acres General

Profile

The Town of Henlopen Acres is the smallest incorporated town in Delaware and encompasses square miles. The town borders the Atlantic Ocean to the northeast, Rehoboth Beach to the southeast and unincorporated sections of Sussex County on the west and north.

According to the 2010 Census, the population of the Town of Henlopen Acres is 122 but will swell to over 16,000 during the summer vacation season.

The Henlopen Acres economy centers on the vacation home and rentals industry.

Risk Assessment

The Town of Henlopen Acres considers their top hazards to be wind related events, and flooding.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Henlopen Acres				x		x	x		x		x	x		x	x	x	x		x

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Henlopen Acres	2016

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Henlopen Acres	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Henlopen Acres	8/15/78

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Henlopen Acres	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Henlopen Acres	M	M	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Henlopen Acres Mitigation Actions Status							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Develop a marina plan for the Town.	Flood, Hurricane	Ongoing	Completed	Public Works Director	N/A	1,000
2	Develop a tree maintenance program in coordination with Ocean View.	High Winds	Long term	N/A	Public Works Director	N/A	N/A
3	Develop an Emergency Management Plan for the Town.	All	Ongoing	Completed	Town Manager	N/A	3,000
4	Maintain beach dune system.	Coastal Erosion	Ongoing	Ongoing	Public Works Director	USACE	
5	Risk and vulnerability assessment of town hall	All	Ongoing	Pending funding source	Town Manager	HMGP, FMA, PDM, CDBG	3,000
6	Back-up generator for town hall	All	Short term	Pending funding source	Town Manager	HMGP, HSGP	145,000
7	Instillation of backflow valves on storm water management system	Flood	Short term	Pending funding source	Public Works Director	HMGP, FMA, PDM, CDBG	15,000

Under timeline for completion, the County has identified the following parameters:

- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Henlopen Acres Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1	✓				
2				✓	
3	✓				
4				✓	
5			✓		
6			✓		
7			✓		

Town of Laurel General

Profile

The Town of Laurel is located on the Atlantic Coastal Plain in southwestern Delaware and encompasses 1.7 square miles.

According to the 2010 Census, the population of the Town of Laurel is 3,708. The

Town of Laurel economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Laurel considers their top hazards to be flooding and wind related events.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Laurel			X		X				X		X			X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Laurel	2011

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Laurel	6

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Laurel	1/16/81

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Laurel	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Laurel	L	L	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Laurel Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Create a service road to the wastewater manholes on West Sixth Street.	Flood	Short term	Delayed due to funding.	Town Manager	HMGP, CDBG, PS	40,000
2	Replace bulkhead on the north side of Broad Creek, between Popular Street and the railroad bridge.	Flood	Short term	Delayed due to funding.	Town Manager	HMGP, FMA, PDM	500,000
3	Consider closing the well at 10th & Deshields street and replace waterlines on 10th Street.		Ongoing	Complete pending closeout	Mayor	N/A	N/A
4	Relocate the Town Hall, Public Works and Police Departments.	Flood	Short term	Delayed due to funding.	Town Manager	HMGP, FMA, PDM	1 million
5	Segregate storm water system from sanitary system.	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM. CDBG	1 million

Under timeline for completion, the County has identified the following parameters:

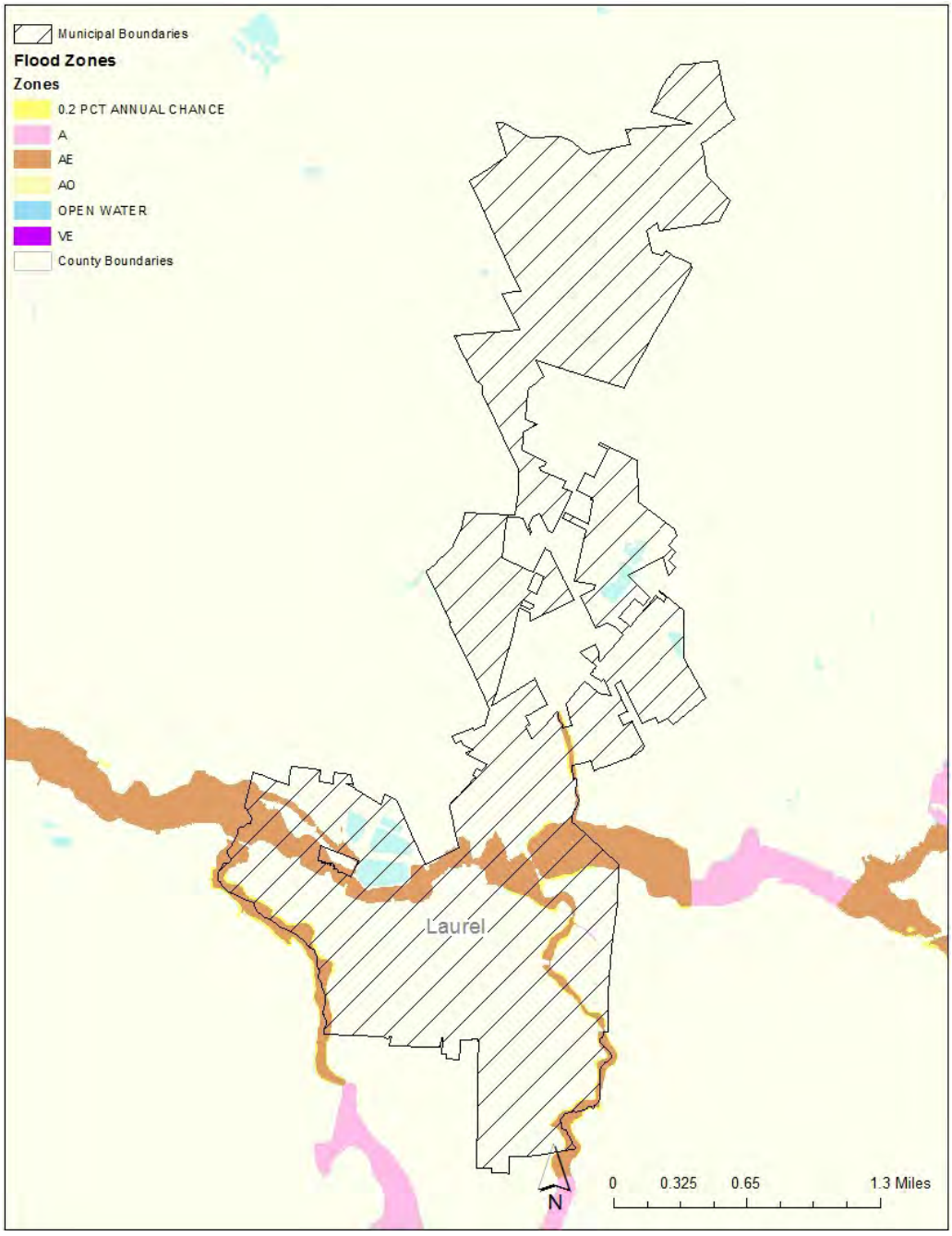
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Laurel Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1		✓			
2		✓			
3				✓	
4		✓			
5			✓		

Figure A-12: Laurel Flood Map



City of Lewes General

Profile

The City of Lewes is located on the Delaware Bay directly across from Cape May New Jersey and encompasses 4.3 square miles.

According to the 2010 Census, the population of the City of Lewes is 2,747. The

City of Lewes economy centers on the tourism and vacation industry.

Risk Assessment

The City of Lewes considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Lewes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Lewes	Updated 2010. 2015 Update in process

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Lewes	9

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Lewes	3/15/77

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Lewes	10/01/92	9

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Lewes	M	M	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

City of Lewes Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Review and update evacuation and notification procedures for the City.	All	Short term	Pending funding source	City Manager	CDBG	Staff costs
2	Improve storm-water management throughout the City.	Flood	Short term	in progress	Public Works Director	HMGP, FMA, PDM, CDBG	1.2 million
3	Increase participation in the National Flood Insurance Program.	Flood	Short term	Unknown	City Manager		Staff costs
4	Minimize damages from high wind events.	High Winds	Ongoing	ongoing	Public Works Director	HMGP, FMA, PDM	25,000
5	Implement / continue application and improvement of hazard mitigation education community outreach program.	All	Ongoing	ongoing	City Manager		5000
6	Reduce vulnerability to wildfires.	Wildfire	Short term	ongoing	Public Works Director	N/A	N/A
7	Continue data acquisition and enhancements to the GIS database.	All	Short term	complete	City Manager		Staff costs
8	Enlist the services of City service organizations in implementing a disaster preparedness outreach program.	All	Ongoing	Pending funding source	Mayor	HMGP, FMA, PDM	2,000
9	Facilitate the coordination of response procedures related to events.	All	Short term	Pending funding source	City Manager	HMGP, FMA, PDM	Staff costs
10	Develop response plans (including evacuation and sheltering procedures) related to special needs populations and pets. Also include a "Refuge of Last Resort" Plan and a plan to transport City residents to county designated shelters.	Flood, Hurricane	Long term	Not started	City Manager	N/A	N/A
11	Study to determine evacuation route elevations to identify flood prone sections/areas.	Flood	N/A	Completed	Public Works Director	N/A	No costs
12	Adoption of International Building Codes	All	N/A	Completed 2014	City Manager	N/A	10,000

Under timeline for completion, the County has identified the following parameters:

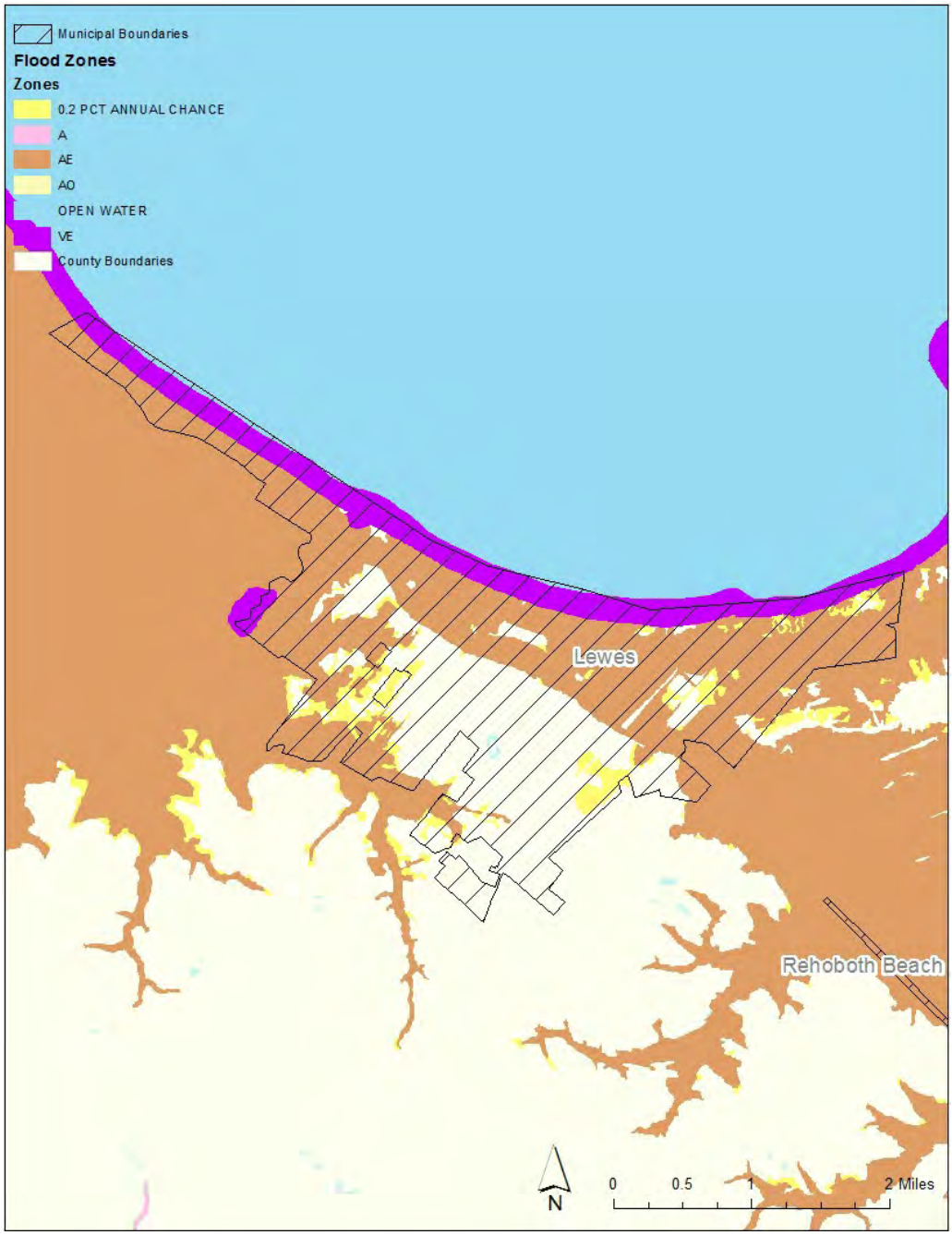
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

City of Lewes Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1				✓	
2		✓			
3				✓	
4		✓			
5		✓			
6	✓				
7		✓			
8		✓			
9				✓	
10				✓	
11	✓		✓		Completed Sept 2015
12	✓		✓		

Figure A-13: Lewes Flood Map



Town of Millsboro

General Profile

The Town of Millsboro encompasses 1.9 square miles. The town is located at the head of the Indian River Bay.

According to the 2010 Census, the population of the Town of Millsboro is 3877 (63% projected growth).

The Millsboro economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Millsboro considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Millsboro			X	X					X					X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Millsboro	2012

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Millsboro	7

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Millsboro	9/01/78

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Millsboro	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Millsboro	M	M	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
Town of Millsboro	1	2	$13,082
Town of Millsboro	1	2	$57,757
Severe Repetitive Loss Properties			
Town of Millsboro	1	2	$28,226

Mitigation Actions Review

Town of Millsboro Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Improve storm-water drainage within the Town. (Wilson Highway and Progress)	Flood	Short term	In progress	Public Works Director	HMGP, FMA, PDM	500,000
2	Conduct a study to identify roads that need to be elevated and culverts that need to be widened.	Flood	Short term	Completed	Public Works Director	HMGP, FMA, PDM	100,000
3	Retrofit two pump stations.	Flood	Short term	Ongoing	Public Works Director	HMGP, FMA, PDM	500,000
4	Retrofit civic center with shutters (Red Cross emergency shelter).	High Winds	Ongoing	Pending funding source	Public Works Director	HMGP, CDBG, PS	N/A
5	Mitchel Street study to evaluate potential bulkhead installation.	Flood	Ongoing	Pending funding source	Emergency Management Coordinator	HMGP, FMA, PDM	500,000
6	Develop storm-water management plan	Flood	Ongoing	Pending funding source	Emergency Management Coordinator	HMGP, FMA, PDM	100,000
7	Cuplin Park (Indian Rive) bulkhead upgrade	Flood	Ongoing	Pending study	Public Works Director	HMGP, FMA, PDM	500,000

Under timeline for completion, the County has identified the following parameters:

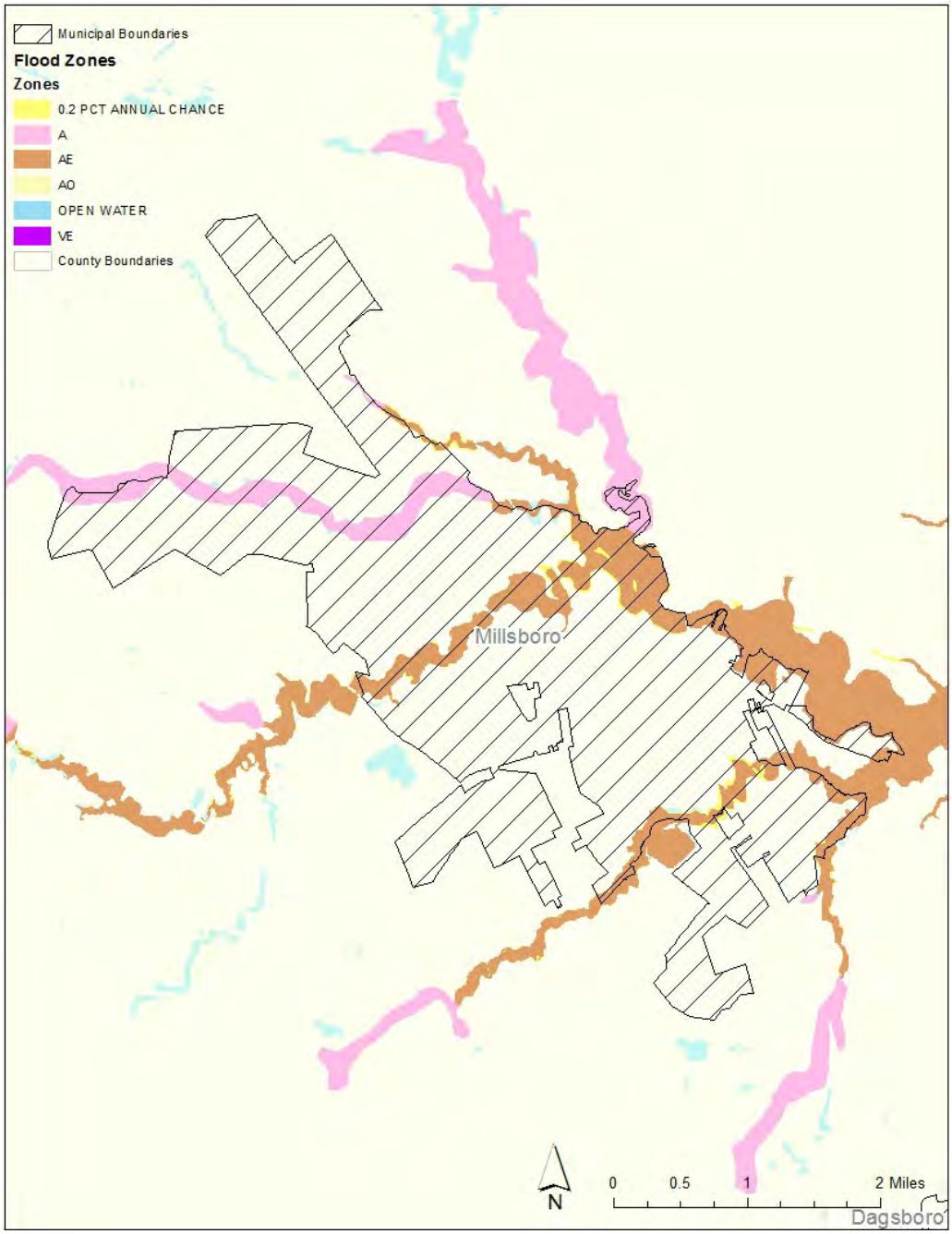
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Millsboro Mitigation Actions Status					
ID#	**Completed**	**Carry Over**	**New**	**Removed**	**Comments**
1		✓			
2		✓			
3	✓				
4				✓	This project is no longer to be considered
5			✓		
6			✓		
7			✓		

Figure A-14: Millsboro Flood Map



Town of Millville

General Profile

The Town of Millville encompasses ½ square mile. The town is bordered to the north, west, and south by unincorporated sections of Sussex County. The Atlantic Ocean and the Town of Ocean View are located to the east of Millville.

According to the 2010 Census, the population of the Town of Millville is 544 but will swell to over 5,000 during the summer vacation season.

The Millville economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Millville considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Millville			X	X					X			X	X	X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Millville	2010

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Millville	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Millville	9/25/81

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Millville	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Millville	M	L	L

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Millville Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Retrofit the Millville Town Hall to include back up power supply. Install a propane powered generator.	All	Short term	Completed	Town Manager	N/A	360,000
2	Conduct an assessment of all culverts to include proper size and design based on current infrastructure and future development.	Flood	Short term	Completed	Town Manager	N/A	N/A
3	Develop mitigation (wind loads) outreach program specifically targeting Millville by the Sea development	High Winds, Hurricane, Winter Storm	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM, CDBG	2,000
4	Improve and upgrade water flow and discharge capacities of tax ditches town wide	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM	150,000

Under timeline for completion, the County has identified the following parameters:

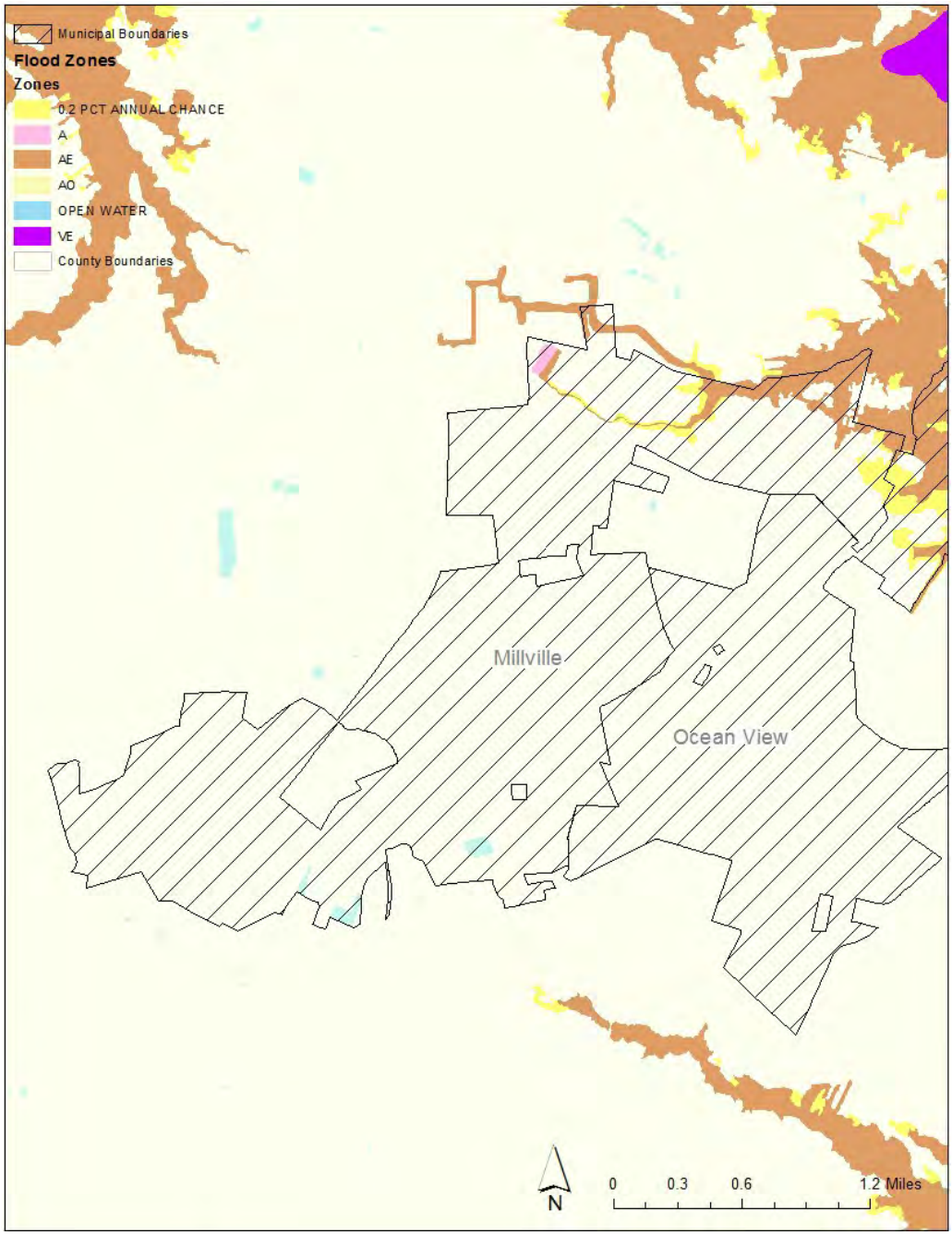
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Millville Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1	✓				
2	✓				Completed by DelDot
3			✓		
4			✓		

Figure A-15: Millville Flood Map



Town of Milton

General Profile

While participating in this plan update, the town of Milford is collocated in both Sussex and Kent County. It was decided that to avoid duplication of effort and avoid conflicts in grant process, the official information specific to Milford will be maintained in the Kent County Hazard Mitigation Plan, as has been in the past. The following represents the Sussex side only.

The Town of Milton is located on the Delmarva Peninsula and encompasses 1.2 square miles.

According to the 2010 Census, the population of the Town of Milton is 2,576.

The Town of Milton economy centers on the tourism, vacation, and retail industry.

Risk Assessment

The Town of Milton considers their top hazards to be flooding, wind related events, winter storms, and extreme heat / cold**.**

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Milton			X	X								X	X	X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Milton	2015

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Milton	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Milton	8/1/78

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Milton	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Milton	L	M	L

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
Town of Milton	1	2	$188,072
Severe Repetitive Loss Properties			
Town of Milton	1	5	$405,659

Mitigation Actions Review

Town of Milton Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Relocate the Town's wastewater treatment plant.	N/A	Short term	Pending funding source	Town Manager	HMGP, CDBG, PS	N/A
2	Promote emergency preparedness information.	All	Short term	Ongoing	Town Manager	HMGP, FMA, PDM, CDBG	No cost
3	Secure water towers and wellheads by enclosing them with approximately 1,200 feet of fence.	Terrorism	Short term	Completed	Public Works Director	DEMA	35,000
4	Join the Community Rating System.	Flood	Short term	Delayed due to staffing	Town Manager	N/A	Administrative costs
5	Improve GIS mapping capabilities.	All	12 months	Delayed due to funding.	Town Manager		
6	Provide dry flood protection techniques for the main well control building on Chandler Street.	Flood	Short term	Pending funding source	Public Works Director	HMGP, FMA, PDM, CDBG	75,000
7	Conduct a study to identify measures to mitigate flooding on Magnolia Street.	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM, CDBG	150,000
8	Route 5 storm-water management strategy study	Flood	N/A	Completed	Town Manager	Coastal Management Grant	30,000
9	Conduct a study to identify measures to mitigate flooding in the downtown area	Flood	Short term	Pending funding source	Town Manager	HMGP, FMA, PDM, CDBG	150,000
10	Modify floodplain management plan to include critical infrastructure protection strategies for police and fire facilities.	Flood	Short term	Pending funding source	Floodplain Administrator	HMGP, FMA, PDM, CDBG	Administrative costs

Under timeline for completion, the County has identified the following parameters:

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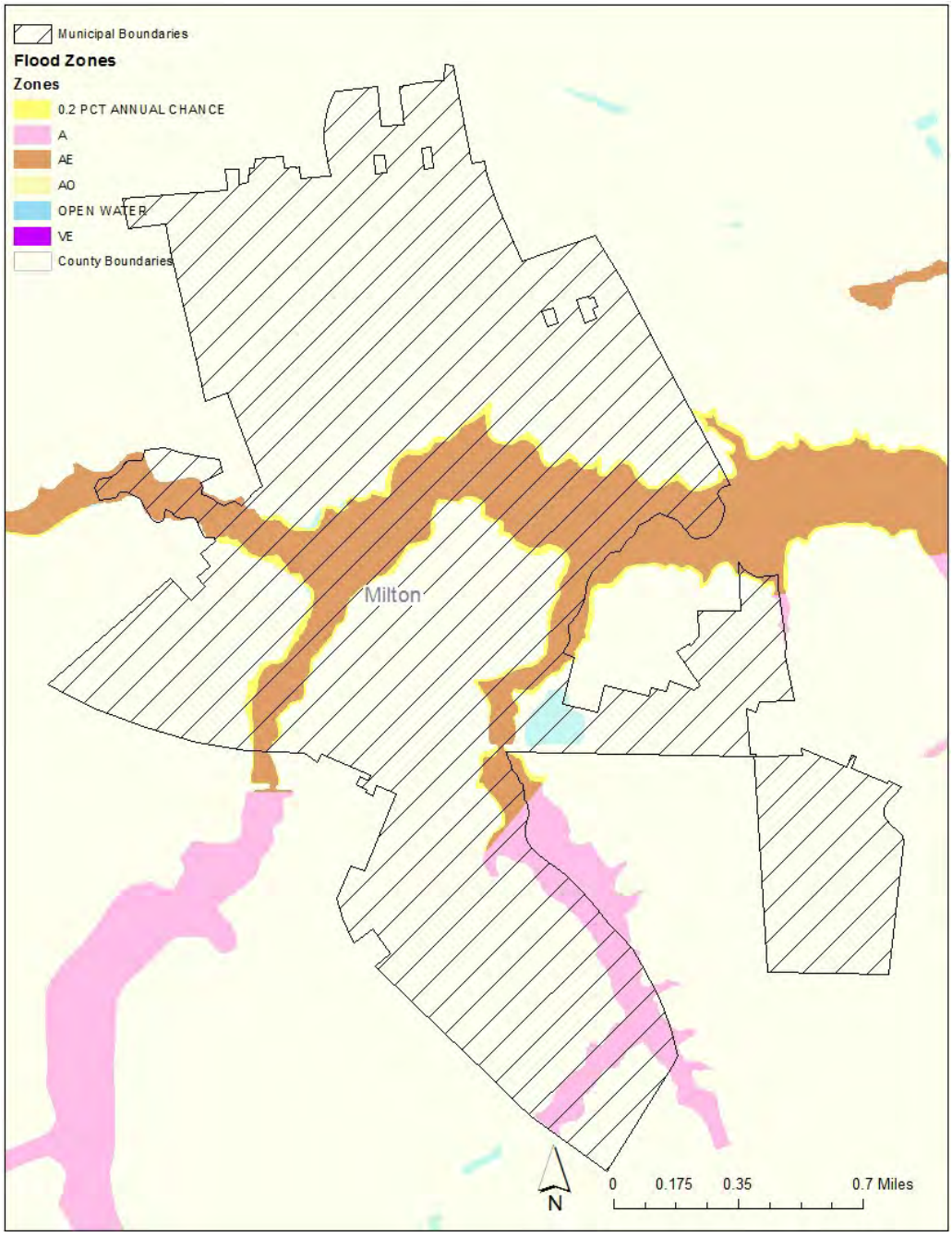
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Milton Mitigation Actions Status					
ID#	**Completed**	**Carry Over**	**New**	**Removed**	**Comments**
1				✓	Removed, not a mitigation action
2		✓			
3	✓				
4		✓			
5		✓			
6		✓			
7		✓			
8	✓				
9		✓			
10		✓			

Figure A-16: Milton Flood Map



Town of Ocean View

General Profile

The Town of Ocean View is located to the east of the Atlantic Ocean, south of Indian River Bay. Bethany Beach borders to the east, Millville is on the west border, and unincorporated sections of Sussex County border the south.

According to the 2010 Census, the population of the Town of Ocean View is 1,882. The

Town of Ocean View economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Ocean View considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Ocean View	X		X	X		X			X		X	X		X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
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The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Ocean View	Revised 2012

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Ocean View	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Ocean View	9/3/80

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Ocean View	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Ocean View	M	M	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Town of Ocean View Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Improve the Town's storm-water management system in some of the older sections of the Town (County Village, County Estates, Meyle Estates, Corner of Daisy and Woodland Avenue, West View Development, and Cottages on Whites Creek). These improvements would include engineering costs to redesign or improve the drainage systems, and the costs to reconstruct and repair swales, drains and culvert piping, and ditches.	Flood	Ongoing	In Progress Partially complete	Town Manager	HMGP, FMS, PDM, CDBG, PG	750,000 done / outstanding work 3 million
2	Improve evacuation routes throughout the Town.	All	Ongoing	Pending funding source	Public Works Director	DEMA	2 million
3	Implement public education and awareness activities to advise residents and visitors about hazards, hazardous areas and mitigation techniques they can use to protect about hazards, hazardous areas and mitigation techniques they can use to protect themselves and their property.	All	Ongoing	In Progress	Town Manager	HMGP, FMS, PDM, CDBG	5,000
4	Adopt a tree management ordinance and maintenance program.	N/A	Ongoing	In Progress	Public Works Director	N/A	N/A
5	Purchase and install GIS to map hazardous areas and events.	All	Short term	Project under development	Town Manager	HMGP, CDBG, PG	10,000
6	Adopt a building code ordinance for the Town.	Flood, High Winds, Hurricane, Winter Weather	12-24 months	Complete, adaptations In Progress	Mayor		
7	Storm water management projects (3) drainage for roads	Flood	Short term	Pending funding source	Public Works Director	HMGP, FMS, PDM	750,000
8	(3) shovel ready storm-water management projects awaiting easement rights.	Flood	Short term	Pending funding source	Public Works Director	HMGP, FMS, PDM	1.5 million
9	Stormwater Drainage pipe system install: Central Ave - 100 feet (Banks Bennetts Tax Ditch floods)	Flood	Short term	Pending funding source	Public Works Director	HMGP, FMS, PDM	500,00
10	Stormwater Drainage pipe system install: Hudson Ave - - 100 feet (Banks Bennetts Tax Ditch floods)	Flood	Short term	Pending funding source	Public Works Director	HMGP, FMS, PDM	500,00

Under timeline for completion, the County has identified the following parameters:

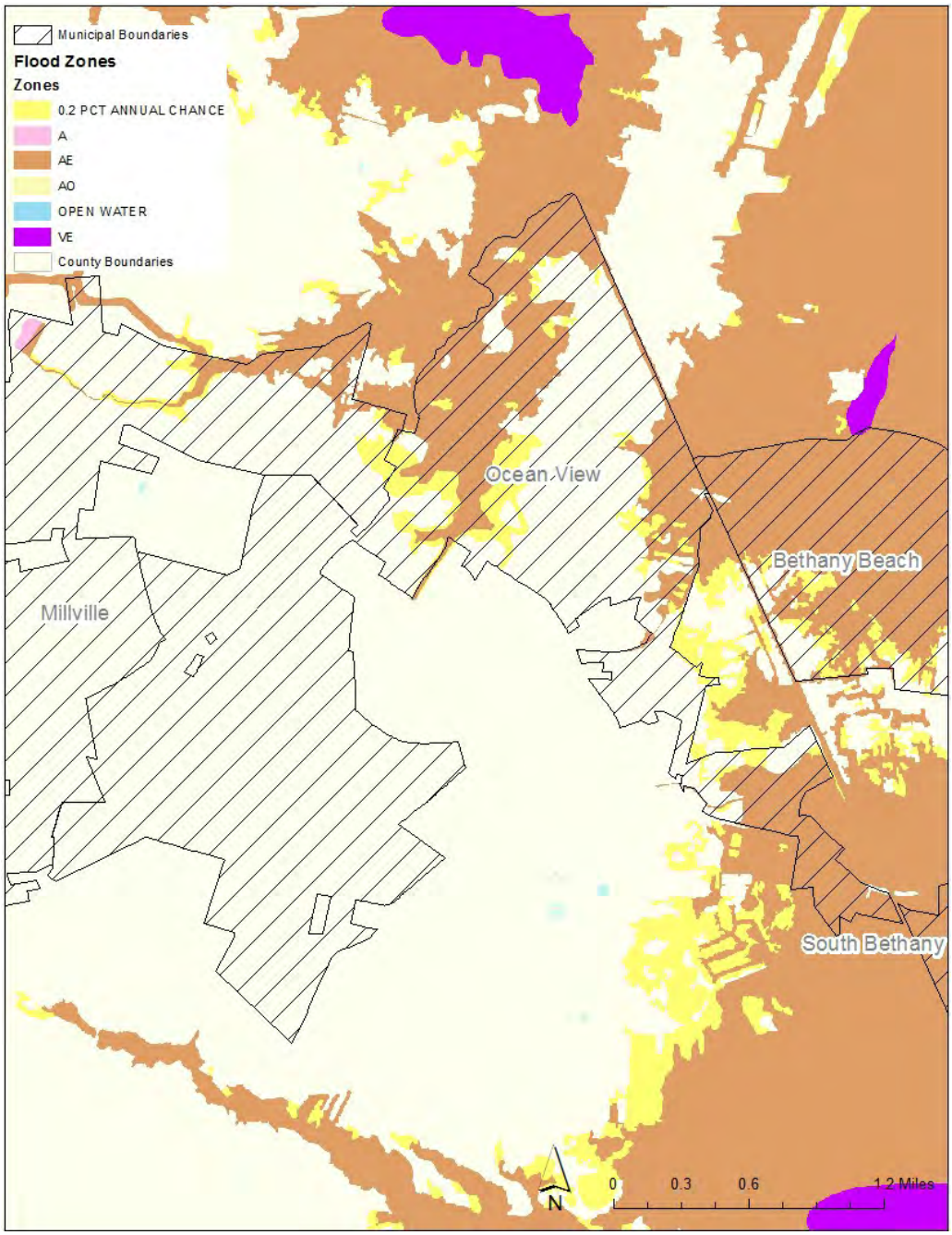
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Ocean View Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1		✓			
2				✓	
3		✓			
4				✓	Not a mitigation action (maintenance)
5		✓			
6	✓				Complete, adaptations In Progress
7			✓		
8			✓		
9			✓		
10			✓		

Figure A-17: Ocean View Flood Map



City of Rehoboth Beach

General Profile

The City of Rehoboth is one of the principal cities of Delaware. The city is located along the Atlantic coast of Delaware and encompasses 1.6 square miles. Dewey Beach borders the city to the south and the Atlantic Ocean to the east.

According to the 2010 Census, the population of Rehoboth Beach is 1,327 but will swell to over 25,000 during the summer vacation season.

The City of Rehoboth's economy centers on the tourism and vacation industry.

Risk Assessment

The City of Rehoboth considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Rehoboth Beach		x	x	x	x	x	x		x		x		x	x	x	x	x	x	x

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Rehoboth Beach	2014

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Rehoboth Beach	6

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Rehoboth Beach	3/30/73

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Rehoboth Beach	10/01/95	8

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Rehoboth Beach	H	M	H

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
City of Rehoboth Beach	1	2	$77,137
Severe Repetitive Loss Properties			
City of Rehoboth Beach	1	4	$150,295
City of Rehoboth Beach	1	6	$119,278
City of Rehoboth Beach	1	4	$108,445
City of Rehoboth Beach	1	5	$77,558

Mitigation Actions Review

City of Rehoboth Beach Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Build retaining wall along boardwalk to prevent damage to businesses, the boardwalk and our street ends.	Flood	N/A	Completed	Public Works Director	USACE, DENREC	750,000
2	Conduct drainage improvements on First Street to increase efficiency by increasing piping capacity.	Flood	N/A	Completed	Public Works Director	HMGP, FMA, PDM	75,000
3	Storm-water management system town wide	Flood	Short-term	Pending funding source	City Manager	HMGP, FMA, PDM	9 million
4	Elevation and engineering study for barrier protection on County Road 300 (Surf Avenue). (In A/V Zone)	Flood	Short-term	Pending funding source	City Manager	HMGP, FMA, PDM	50,000
5	Wilmington and Delaware Ave storm-water management study	Flood	Short-term	Pending funding source	Public Works Director	HMGP, FMA, PDM	50,000
6	Develop multi-lingual community outreach	All	Short-term	Pending funding source	City Manager	HMGP, FMA, PDM, CDBG	15,000

Under timeline for completion, the County has identified the following parameters:

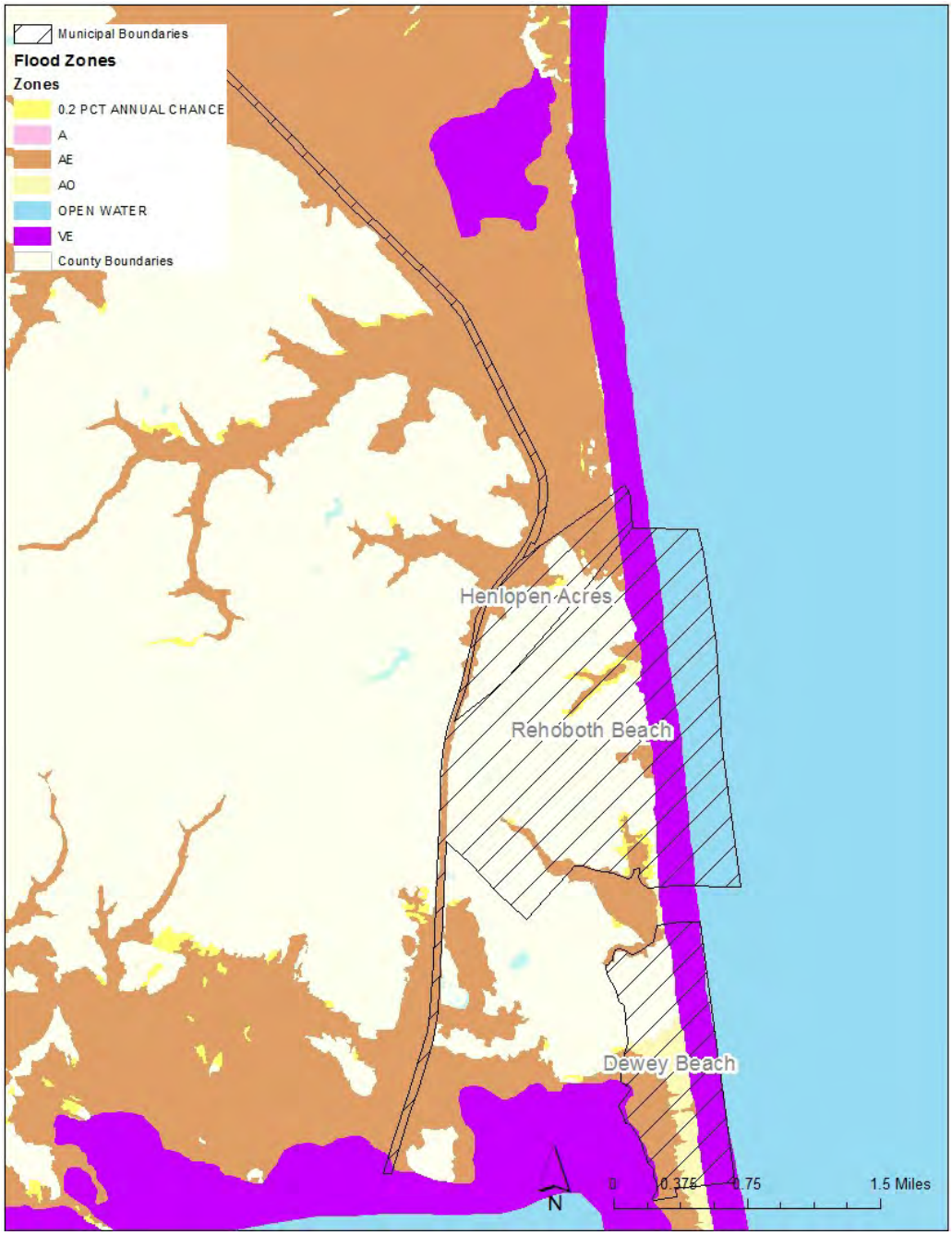
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

City of Rehoboth Beach Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1	✓				
2	✓				
3			✓		
4			✓		
5			✓		
6			✓		

Figure A-18: Rehoboth Beach Flood Map



City of Seaford

General Profile

The City of Seaford is the largest city within Sussex County and encompasses 3.5 square miles.

According to the 2010 Census, the population of the City of Seaford is 6,928. The

City of Seaford economy centers on the tourism and vacation industry.

Risk Assessment

The City of Seaford considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Seaford		X	X	X		X	X		X	X		X	X	X	X	X	X	X	X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Seaford	Updated 2015

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Seaford	6

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Seaford	2/01/79

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Seaford	10/01/96	9

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Seaford	M	M	H

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

City of Seaford Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Conduct computer modeling of key drainage in and around the City to identify restrictions and/or potential problems. Also identify necessary modification or repairs to improve functionality.	Flood	Short term	In process	City Manager	N/A	Zero cost
2	Address street flooding in the Washington and State Street area- identify necessary modification or repairs to improve functionality.	Flood	Short term	Completed	Public Works Director	N/A	1.99 million
3	Ensure security of water production sites and storage facilities.	Terrorism	Short term	Pending funding source	City Manager	HMGP, CDBG, HSGP	50,000
4	Develop agreements with local businesses to assist during emergencies (i.e., provide items such as heavy equipment and other resources).	All	Short term	Pending funding source	Mayor	N/A	N/A
5	Identify key personnel to manage a crisis.	All	Short term	Pending funding source	City Manager	N/A	N/A
6	Construct storm drain improvements on Washington Street to increase the drainage capacity of the area and prevent future flooding.	Flood	Short term	Completed	Public Works Director	N/A	Same project as 2
7	Construct storm-water drains on Porter Street to increase the drainage capacity of the area and prevent future flooding.	Flood	Short term	Completed	Public Works Director	N/A	750.00
8	Stormwater management system Virginia Ave (regional system project to protect rep loss properties due to improper construction.	Flood	Short term	Completed	Public Works Director	N/A	200,000

Under timeline for completion, the County has identified the following parameters:

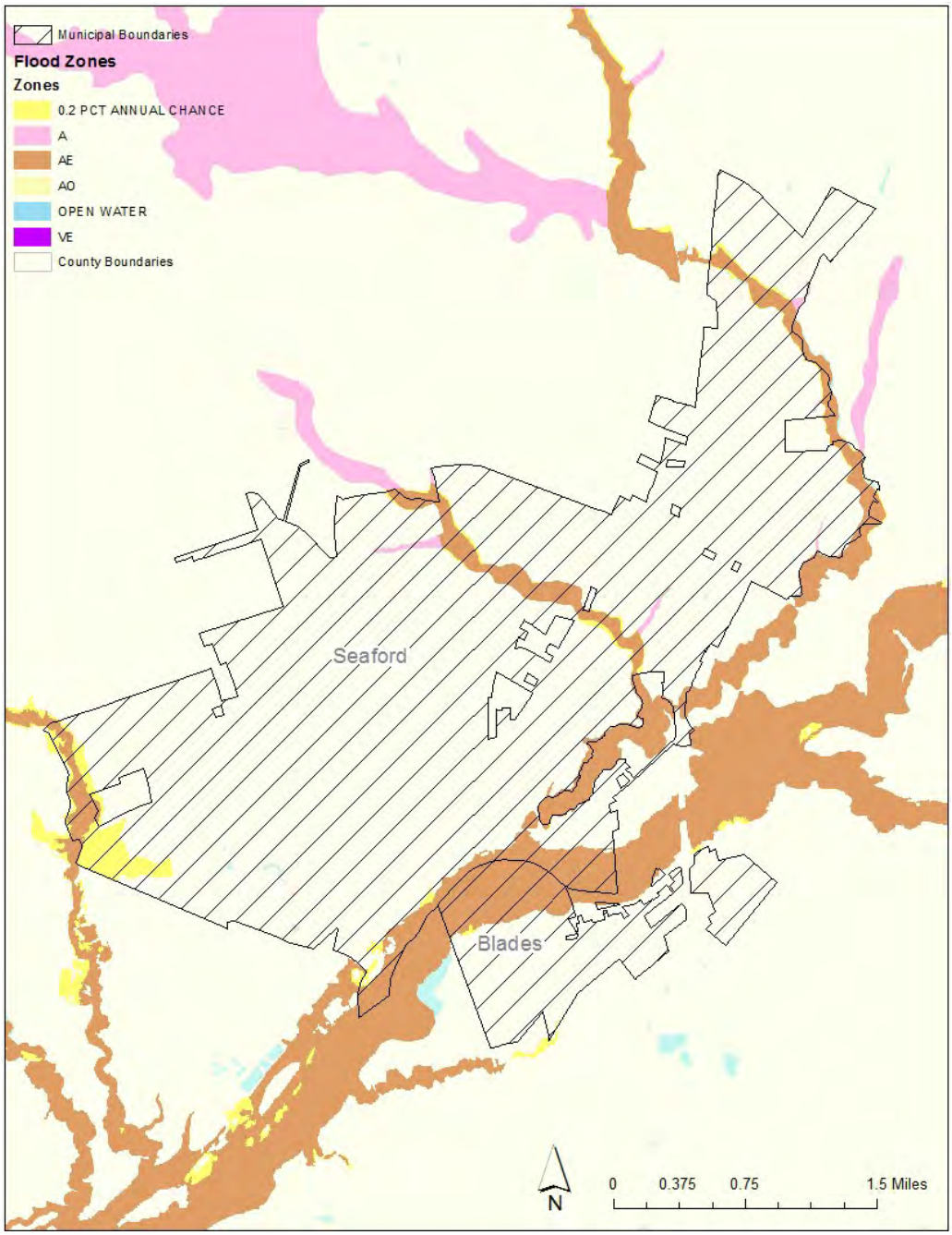
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

City of Seaford Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1		✓			
2	✓				
3				✓	
4				✓	
5				✓	
6	✓				
7	✓				
8	✓		✓		

Figure A-19 Seaford Flood Map



Town of Selbyville

General Profile

The Town of Selbyville is encompasses 1.4 square miles.

According to the 2010 Census, the population of the Town of Selbyville is 2,167. The

Town of Selbyville's economy centers on the poultry industry.

Risk Assessment

The Town of Selbyville considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Selbyville	X		X	X	X	X			X		X	X	X	X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Selbyville	2016

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Selbyville	8

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Selbyville	7/16/91

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Selbyville	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Selbyville	M	M	M

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Mitigation Actions Review

Town of Selbyville Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Replace deteriorating bridge and culverts on Railroad Avenue over major storm water management ditch.	Flood	Ongoing	Pending funding source.	Mayor	HMGP, CDBG, PS	1.2 million
2	Educate residents and improve public awareness on being better prepared to face hazards.	All	Ongoing	Ongoing	Mayor	HMGP, FMA, PDM, CDBG	4,000 start up 2,500 annual
3	Storm Preparedness Plan: plan calls for community alerts, storm vulnerable materials removal by public works	All	N/A	Ongoing	Mayor	N/A	Minimal built in

Under timeline for completion, the County has identified the following parameters:

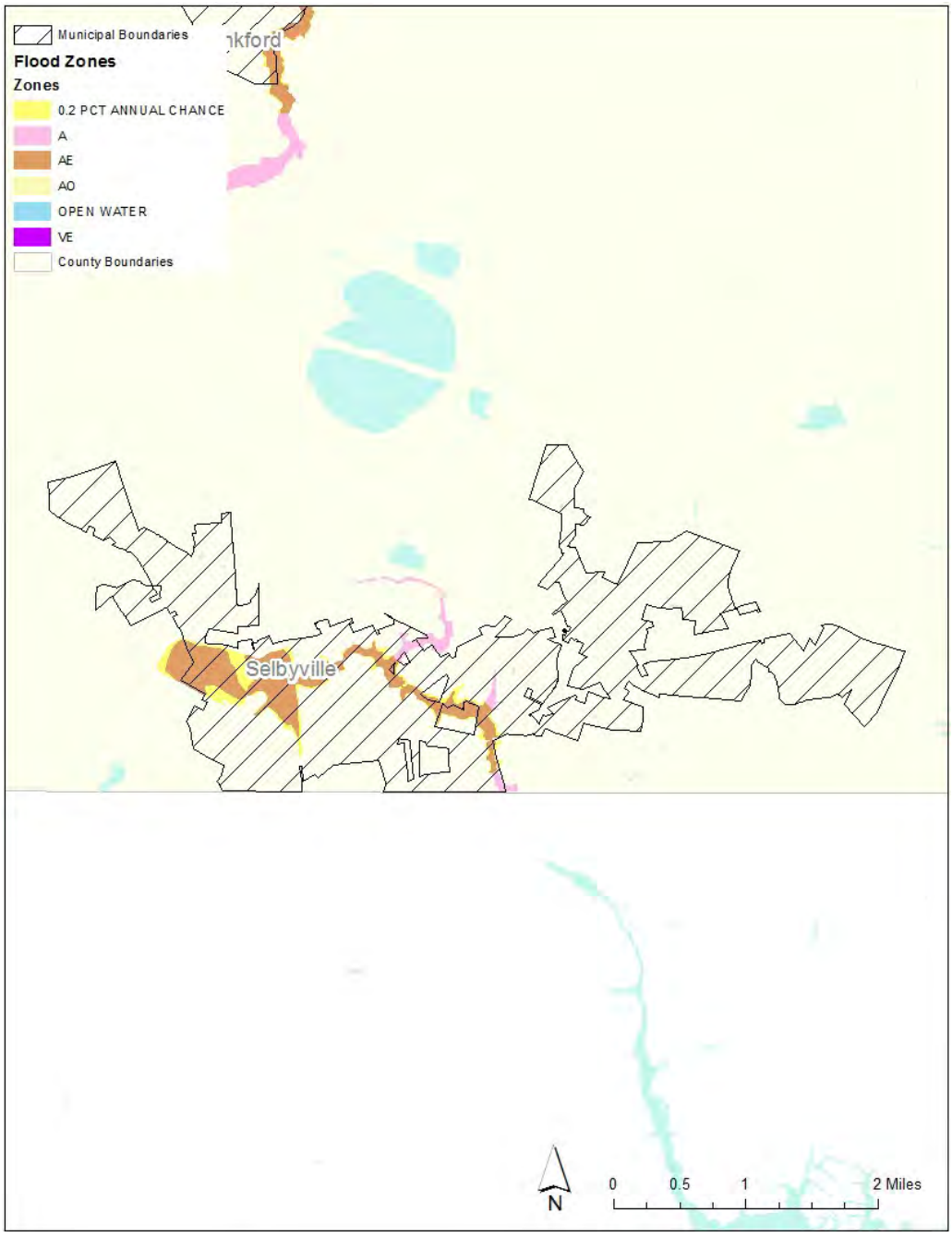
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Selbyville Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1		✓			
2		✓			
3			✓		

Figure A-20: Selbyville Flood Map



Town of Slaughter Beach

General Profile

The Town of Slaughter Beach encompasses 1.3 square miles.

According to the 2010 Census, the population of the Town of Slaughter Beach is 207. The

Town of Slaughter Beach economy centers on the tourism and vacation industry.

Risk Assessment

The Town of Slaughter Beach considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Slaughter Beach			X			X	X		X			X		X	X	X	X		X

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Slaughter Beach	2010, update 2016

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
Slaughter Beach	8*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Slaughter Beach	7/02/80

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Slaughter Beach	N/A	N/A

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Slaughter Beach	L	L	L

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
N/A	N/A	N/A	N/A

Town of Slaughter Beach Mitigation Actions							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Improve storm-water drainage throughout the Town.	Flood	Short term	Ongoing	Mayor	HMGP, FMA, PDM	180,000
2	Flood-proof water pumping stations.	Flood	Short term	Ongoing	Mayor	HMGP, FMA, PDM	Unknown
3	Elevate access and evacuation roads that flood (Route 224 - Slaughter Beach Road approximately 1' - 4' from intersection of Bay Avenue to west boundary of Prime Hook National Wildlife Refuge (± 1 mile).	Flood	Short term	Pending Vulnerability Assessment	Mayor	HMGP, FMA, PDM, CDBG, PS, USACE	10 million
4	Elevate flood-prone homes.	Flood	Short term	Ongoing	Mayor	DEMA	205,000
5	Initiate storm-water management system improvements along ± 1 mile of North Bay	Flood	Short term	Ongoing	Mayor	HMGP, FMA, PDM	180,000
6	Beach Restoration & Contouring with Grass Planting.	Coastal Erosion	Long term	Ongoing	Mayor	DNERC	15,000
7	Perform regular beach re-nourishment.	N/A	Ongoing	Delayed	Mayor		
8	Develop automated telephone warning system.	All	Short term	Completed via email system	Mayor	Self	1,000
9	Restore and/or re-nourish beach and protective dunes.	Coastal Erosion	When funds become available	Not started	Mayor		
10	Develop a strategy to improve NFIP enforcement processes to include local permitting processes.	Flood	Ongoing	Completed	Floodplain Administrator	Self	Administrative costs
11	Provide building/zoning/flood zone ordinances to public via Web site or other electronic means.	Flood	Short term	Completed	Floodplain Administrator	Self	Administrative costs
12	Community Vulnerability Assessment	All	Ongoing	Ongoing	Mayor	Delaware Coastal Program	
13	Wastewater Management Feasibility Study	Flood	Short term	Ongoing	Mayor	CBDG, HMGP, HSGP, FMA, PDM, PS	60,000
14	Severe Weather Sheltering Facility	High Winds, Hurricane, Severe Winter Weather	Ongoing	Ongoing	Mayor	Fire Department, HMGP, PDM, PS	Administrative Costs
15	Wildfire – Phragmites control project	Wildfire	Short term	Ongoing	Mayor	Delaware Forest Service	10,000
16	Water Level Monitoring in Marsh	Flood	Short term	Ongoing	Floodplain Administrator	University of Delaware, DNREC	Unknown
17	North Jetty Repair	Flood, Coastal Erosion	Short term	Long term	Mayor	USACE	30,000,000
18	Propane tank tie down ordinance	Hazardous	Short term	Long term	Mayor	Community	1,500

		Materials					

Under timeline for completion, the County has identified the following parameters:

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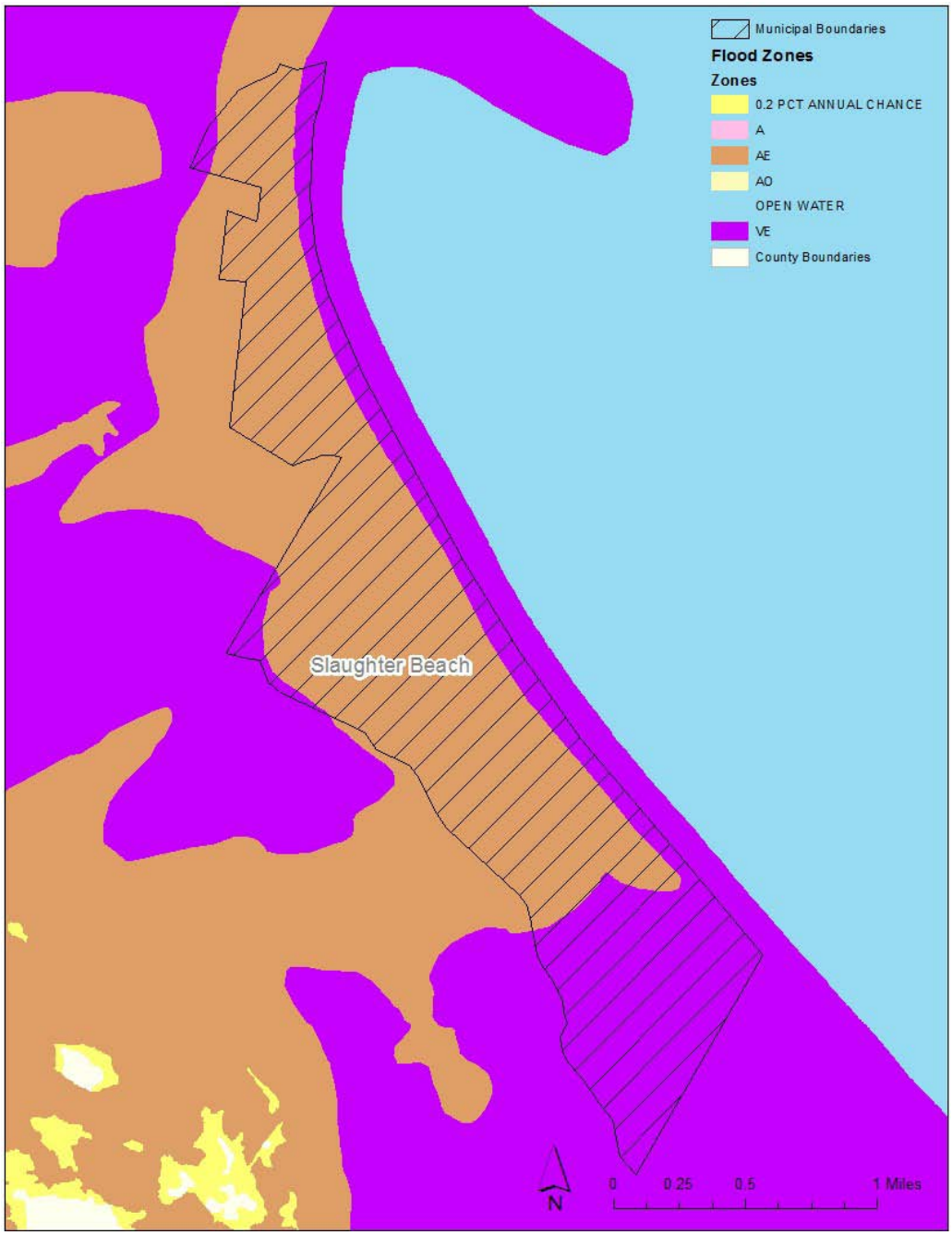
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of Slaughter Beach Mitigation Actions Status					
ID#	Completed	Carry Over	New	Removed	Comments
1		✓			
2		✓			
3		✓			
4		✓			
5		✓			
6			✓		
7				✓	Not a fundable mitigation action
8	✓				
9		✓			
10	✓		✓		
11			✓		
12			✓		
13			✓		
14			✓		
15			✓		
16			✓		
17			✓		
18			✓		

Figure A-21: Slaughter Beach Flood Map



Town of South Bethany

General Profile

The Town of South Bethany encompasses 0.5 square miles. The town is bordered to the north by Bethany Beach, Fenwick Island to the south, the Atlantic Ocean to the east, and unincorporated sections of Sussex County to the west.

According to the 2010 Census, the population of the Town of South Bethany is 449 but will swell to over 1,400 during the summer vacation season.

The Town of South Bethany economy centers on the tourism and vacation industry.

Risk Assessment

The Town of South Bethany considers their top hazards to be flooding, wind related events and winter storms, and extreme heat / cold.

Capabilities

Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
South Bethany		x	x	x		x	x		x		x	x		x	x	x	x	x	x

- **HMP** – Hazard Mitigation Plan
- **DRP** – Disaster Recovery Plan
- **CLUP** – Comprehensive Land Use Plan
- **FMP** – Floodplain Management Plan / Flood Mitigation Plan
- **SMP** – Stormwater Management Plan
- **EOP** – Emergency Operations Plan
- **COOP** – Continuity of Operations Plan
- **REP** – Radiological Emergency Plan
- **SARA** – SARA Title III Emergency Response Plan
- **TRANS** – Transportation Plan
- **CIP** – Capital Improvements Plan (that regulates infrastructure in hazard areas)
- **REG-PL** – Regional Planning
- **HPP** – Historic Preservation Plan
- **ZO** – Zoning Ordinance
- **SO** – Subdivision Ordinance
- **FDPO** – Flood Damage Prevention Ordinance
- **NFIP** – National Flood Insurance Program
- **CRS** – Community Rating System
- **BC** – Building Codes

The following indicates significant indicators for a local jurisdiction's ability to implement mitigation strategy. Not all jurisdictions have all five subsections.

- B-1 - Local Comprehensive Plan Update
- B-2 - Building Code Effectiveness Grading Schedule (BCEGS)
- B-3 - National Flood Insurance Program participation
- B-4 - Community Rating System Participation
- B-5 - Self-assessment of Local Capability

B-1: Local Comprehensive Plan Updates

Jurisdiction	Plan Status
South Bethany	Complete 10-year re-cert (2016) Pending

B-2: BCEGS Grades for Sussex County Jurisdiction's

Jurisdiction	BCEGS Grade
South Bethany	*Declined Participation*

B-3: NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
South Bethany	10/06/76

B-4: CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
South Bethany	10/01/07	8

B-5: Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
South Bethany	M	L	H

L=Low capability, M=Moderate capability, H=High capability

NFIP Registered Repetitive Loss Properties

Jurisdiction	Number of Properties	Number of Losses	Total Cost
Repetitive Loss Properties			
N/A	N/A	N/A	N/A
Severe Repetitive Loss Properties			
Town of South Bethany	1	5	$100,038

Mitigation Actions Review

Town of South Bethany Mitigation Actions Status							
ID	**Mitigation Action**	**Hazard Addressed**	**Timeline**	**Status**	**Responsible Agency**	**Potential Funding Sources**	**Estimated Cost**
1	Implement regular and emergency beach replenishment or re- nourishment as part of the DNREC/ Corps of Engineers 50-year plan.	Coastal Erosion	Ongoing	In Progress	Public Works Director	USACE, DNREC	N/A
2	Improve storm-water drainage throughout the Town.	Flood	Ongoing	In Progress	Town Administrator	HMGP, FMA, PDM	250,000
3	Continue to identify and promote flood-proofing/elevation solutions to at-risk homes throughout the Town in accordance with current FEMA regulations.	Flood	Ongoing	In Progress	Town Administrator	HMGP, FMA, PDM	2,000
4	Upgrade the Town's Building and Zoning Ordinances to reflect NFIP and ISO requirements.	Flood	Short term	Complete	Floodplain Administrator	Self-funding	1,000
5	Flood elevation one house - Back bay (204 Carlisle Road/Drive)	Flood	Short term	Complete	Town Administrator	N/A	59,000
6	Sea Level Rise Committee formed: Elevation mapping of entire town	Flood	Ongoing	Ongoing	Town Administrator	HMGP, FMA, PDM	10,000
7	Public Outreach by Sea Level Committee	All	Ongoing	Ongoing	Town Administrator	Self-funding	1,000

Under timeline for completion, the County has identified the following parameters:

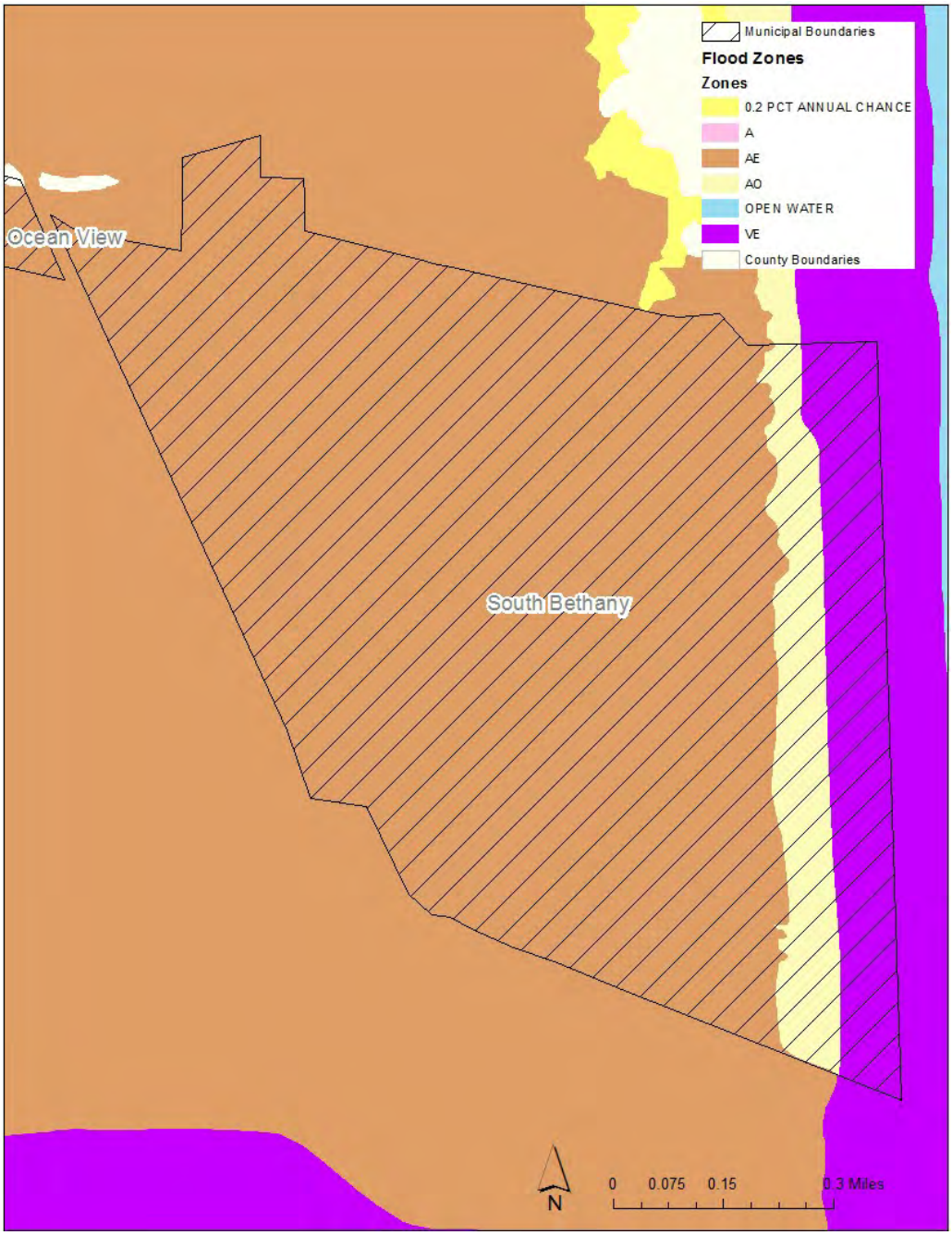
- **Ongoing:** Initiative is currently being implemented under existing programs and budgets.
- **Short-term:** Initiative can be completed within 1 to 5 years once funding has been secured.
- **Long-term:** Initiative will take 5 or more years to complete once funding has been secured.

Under the potential funding sources, the acronyms align with the following programs:

- **CDBG:** Community Development Block Grant Program
- **FMA:** Flood Mitigation Grant Program
- **HMEP:** Hazardous Materials Emergency Preparedness Grant
- **HMGP:** Hazard Mitigation Grant Program
- **HSGP:** Homeland Security Grant Program
- **PDM**: Pre-Disaster Mitigation Grant Program
- **PS:** Private Sector Grants
- **RERP:** Radiological Emergency Response Program

Town of South Bethany Mitigation Actions Status					
ID#	**Completed**	**Carry Over**	**New**	**Removed**	**Comments**
1				✓	Not a fundable mitigation action
2		✓			
3		✓			
4	✓				
5	✓				
6			✓		
7			✓		

Figure A-22: South Bethany Beach Flood Map



ANNEX B: ACRONYMS

A

AL	Annualized Loss
ALOHA	Area Locations of Hazardous Atmospheres
ALR	Annualized Loss Ratio

B

BC	Building Codes
BCEGS	Building Code Effectiveness Grading Schedule
BFE	Base Flood Elevation

C

CDBG	Community Development Block Grant
CFM	Certified Floodplain Manager
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
CLUP	Comprehensive Land Use Plan
COOP	Community of Operation Plan
CPRI	Calculated Priority Risk Index
CRS	Community Rating System (National Flood Insurance Program)

D

DEMA	Delaware Emergency Management Agency
DFIRM	Digital Flood Insurance Rate Maps
DLLG	Delaware League of Local Governments
DNREC	Delaware Department of Natural Resources and Environmental Control
DOE	Department of Energy
DRBC	Delaware River Basin Commission
DRP	Disaster Recovery Plan
DSP	Delaware State Police

E

EF-Scale	Enhanced Fujita Scale

EG	Estimated Gust
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOP	Emergency Operations Plan

F

FDPO	Flood Damage Prevention Ordinance
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FMP	Flood Plain Manager
FR	Final Rule

G

GIS	Geographic Information System
GPS	Global Positioning System

H

Hazus-MH	FEMA's loss estimation software
HazMat	Hazardous Materials
HI	Heat Index
HIRA	Hazard Identification and Risk Assessment
HMEP	Hazardous Materials Emergency Preparedness Grant
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HMSC	Hazard Mitigation Steering Committee
HMWG	Hazard Mitigation Working Group
HPP	Historic Preservation Plan
HSGP	Homeland Security Grant Program

I

ISO	Insurance Services Office

L

Annex B

LEPC	Local Emergency Planning Committee
LNG	Liquefied Natural Gas
M	
MCD	Minor Civil Division
MG	Measured Gust
N	
NCDC	National Climate Data Center
NESIS	Northeast Snowfall Impact Scale
NFIP	National Flood Insurance Program
NHC	National Hurricane Center
NID	National Inventory of Dams
NOAA	National Oceanic and Atmospheric Administration
NSFHA	No Special Flood Hazard Area
NWS	National Weather Service
O	
OEM	Sussex County Office of Emergency Management
OGL	The Olson Group Ltd.
P	
PDM	Pre-Disaster Mitigation
PDSI	Palmer Drought Severity Index
PSG	Private Sector Grant
R	
REG-PL	Regional Plan
REP	Radiological Emergency Plan
RERP	Radiological Emergency Response Program
RFC	Repetitive Flood Claim (NFIP)
S	
SCAT	Sussex County Association of Towns
SCEOC	County Emergency Operations Center
SERC	SERC Reliability Corporation, North American Electric Reliability Corporation

SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SLOSH	Sea, Lake, and Overland Surges from Hurricanes
SMP	Stormwater Management Plan
SO	Subdivision Ordinance
SRL	Severe Repetitive Loss (NFIP)

T

TRANS	Transportation Plan

U

UR	Unranked
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey

W

WCT	Wind Chill Temperature Index
WMD	Weapon of Mass Destruction

Z

ZO	Zoning Ordinance

ANNEX C: PLANNING PROCESS

Contents of this Appendix

C.1 Meetings and Working Sessions

On the following pages are copies of agendas, sign-in sheets, presentation materials, and meeting notes where appropriate for the following meetings and working sessions:

November 30, 2015	Project Kick-off Meeting
January 8, 2016	Steering Committee Coordination
January 20, 2016	Steering Committee Kick-off Meeting
January 20, 2016	Working Group Kick-off Meeting
March 24, 2016	Combined Steering Committee and Working Group Meeting
March 24, 2016	Sussex County Planning & Zoning Public Meeting
April 5, 2016	HAZUS Coordination Meeting
August 8, 2016	County Council Presentation
August 10 /11, 2016	One-on-one Municipal Working Sessions
September 1, 2016	Public Meeting with Mallard Lake Community
September 1, 2016	Public Meeting, Combined Steering Committee and Working Group Meeting

HMP Steering Committee Coordination Agenda

9:30 AM 11/30/2015

- **Review of minutes from last meeting**
- **Status of HMP Grant Extension Request to DEMA/FEMA**
- **Identification of Steering Committee and Stakeholder Group Members**
- **Discussion of date for the Initial Planning Meetings with the HMP Steering Committee and the HMP Stakeholder Working Group**
- **Outstanding Actions**

PROJECT KICKOFF MEETING MINUTES

11/30/2015

Date and Location. A Project Kickoff Meeting conference call was held on November 30, 2015 at 2:30 PM in preparation for an upcoming Hazard Mitigation Plan (HMP) Steering Committee Coordination meeting.

Participants. Project Kickoff Meeting conference call attendees included:

- Sussex County Emergency Operations Center (EOC)
- The Olson Group, LTD (OGL)

Purpose. The purpose of the Project Kickoff Meeting was to review the OGL proposal, project plan, and timeline, set a date for the Steering Committee Coordination Meeting, and initiate discussion of HMP objectives, and stakeholders. Discussion and agreements made between meeting attendees during the meeting are provided below.

Overview of Activities

Review of Proposal, Project, Plan, and Timeline: Adam Montella from OGL led a review of the components of OGLs proposal, project plan, and timeline. Attendees were in agreement on the approach and timeline, but recognized the need to request an extension of the grant funding the HMP update from DEMA and FEMA due to a delay in contracting due to the County's procurement process. Joe Thomas of the Sussex County EOC requested OGL provide a revised timeline, assuming a formal kickoff of the project on January 8, 2015 with the Steering Committee Coordination Meeting.

Discussion of Steering Committee and Stakeholder Group Members: Mr. Montella facilitated a discussion with the meeting attendees regarding the formation of a HMP Steering Committee and Stakeholder Group to participate in the revision of the updated HMP. Anthony Mangeri of the OGL Team discussed the need to involve the "Whole Community" in the process and the stakeholder group should be a combination of county, municipal, state, and private sector representation. The meeting attendees agreed the HMP Steering Committee should be a much smaller group that represented the interests of the larger Stakeholder Group. The attendees discussed the following organizations and agencies to be part of the Stakeholder Group:

- Sussex County Emergency Operations Center
- Delaware Emergency Management Agency (DEMA)
- Sussex County Planning and Zoning
- Sussex County LEPC
- Floodplain Manager from the LEPC
- Representatives from the 18 Municipalities
- Sussex County Economic Development Office
- Chamber of Commerce

- DelDOT
- Sussex County Conservation District
- University of Delaware
- Delmarva Poultry Industry

It was decided to table the discussion of Steering Committee Member until the Steering Committee Coordination Meeting on January 8, 2016

Planning Conferences. Additional planning conferences were scheduled as follows:

- **Steering Committee Coordination Meeting:** The Steering Committee Coordination Meeting, scheduled for January 8, 2016 at 9:30 AM via conference call, will be conducted to finalize the selection of HMP Steering Committee Members, and schedule the Initial Planning Meeting of the HMP Steering Committee and Stakeholders.

Outstanding Actions

The following actions remain:

- OGL to revise Project Timeline and submit to Sussex County Emergency Operations Center
- OGL to send out Minutes from this meeting
- Sussex County Emergency Operations Center to finalize OGL contract
- Sussex County Emergency Operations Center to request HMP grant extension from DEMA/FEMA

Hazard Mitigation Plan Update Project Points of Contact (POCs)

Sussex County:

Joe Thomas
302-855-7801

The Olson Group, Ltd.

Adam Montella, Project Manager
813-657-5395

Anthony Mangeri Lead Planner
856-217-9172

Attendee List

The following individuals attended the Initial Planning Meeting.

Name	Organization	Phone Number	E-Mail
Joe Thomas	Sussex EOC	302-855-7801	jthomas@sussexcountyde.gov
Adam Montella	The Olson Group	813-657-5395	amontella@olsongroupltd.com
Anthony Mangeri	Mangeri Group	856-217-9172	amangeri@mangerigroup.com

HMP Steering Committee Coordination Meeting Minutes

1/8/2016

Date and Location. A HMP Steering Committee Coordination Meeting conference call was held on January 8, 2016 at 9:30 AM in preparation for an upcoming Hazard Mitigation Plan (HMP) Steering Committee Initial Planning Meeting and a HMP Stakeholder Working Group Initial Planning Meeting.

Participants. HMP Steering Committee Coordination Meeting conference call attendees included:

- Sussex County Emergency Operations Center (EOC)
- The Olson Group, LTD (OGL)
- The Mangeri Group

Purpose. The purpose of the HMP Steering Committee Coordination Meeting was to review the status of the HMP grant extension request and set a date for the Initial Planning Meetings for the HMP Steering Committee and the HMP Stakeholder Working Group. Discussion and agreements made between meeting attendees during the meeting are provided below.

Overview of Activities

Status of HMP Grant Extension Request to DEMA/FEMA: Joe Thomas from the Sussex County Emergency Operations Center briefed the meeting attendees of the status of the HMP Grant extension request. Mr. Thomas met with DEMA and FEMA by conference call on January 7 to discuss the project, the project timeline, and the request for an extension to the Grant funding for the project. Mr. Thomas advised that DEMA concurred with the request and FEMA is expected to approve a six-month extension to the project. This will provide a buffer of an additional 2 months based on the revised project timeline. Mr. Thomas will be preparing the formal request.

Discussion of Steering Committee and Stakeholder Group Members: Mr. Montella facilitated a discussion with the meeting attendees regarding the formation of a HMP Steering Committee and Stakeholder Group to participate in the revision of the updated HMP. Anthony Mangeri of the OGL Team re-iterated the need to involve the "Whole Community" in the process and the stakeholder group should be a combination of county, municipal, state, and private sector representation. The meeting attendees agreed on the composition of the Stakeholder Working Group, but acknowledged the Group may be expanded to incorporate other stakeholders as the planning progresses. The Stakeholder Working Group member organizations identified for the Initial Planning Meeting were:

- Sussex County Emergency Operations Center
- Delaware Emergency Management Agency (DEMA)
- Sussex County GIS

- Sussex County Planning and Zoning
- Sussex County LEPC
- Floodplain Manager from the LEPC
- Representatives from the 18 Municipalities
- Sussex County Economic Development Office
- Chamber of Commerce
- DelDOT
- Sussex County Conservation District
- University of Delaware
- Delmarva Poultry Industry

Participants then discussed the organization of the HMP Steering Committee members and agreed on a five-person committee consisting of the following agency/organizational representatives:

- Sussex County Emergency Operations Center
- Sussex County Planning and Zoning
- Sussex County LEPC
- Sussex County Association of Town
- DEMA

The meeting participants then set the date of the date and time of the Initial Planning Meeting of the HMG Steering Committee for January 20 at 2:00 PM at the Sussex County EOC, followed by the Initial Planning Meeting of the HMP Stakeholder Working Group at 3:00 at the same location. OGL/Mangeri Group will develop an agenda and read-ahead packet that will be sent out in advance of the meeting. Joe Thomas will send out invitations early next week to get the date and time on invitees calendars. The remainder of the planning schedule and public meetings will be discussed at the Initial Planning Meeting of the HMP Steering Committee.

Planning Conferences. Additional planning conferences were scheduled as follows:

- **Initial Planning Meeting for the HMP Steering Committee:** January 20, 2016 at 2:00 PM in the Sussex County Emergency Operations Center
- **Initial Planning Meeting for the HMP Stakeholder Working Group:** January 20, 2016 at 3:00 PM in the Sussex County Emergency Operations Center

Outstanding Actions

The following actions remain:

- OGL to send out Minutes from this meeting
- OGL and Mangeri Group to develop meeting agendas and prepare read-ahead materials

- OGL and Mangeri Group to review and analyze the current Sussex County Hazard Mitigation Plan
- Sussex County Emergency Operations Center to request HMP grant extension from DEMA/FEMA
- Sussex County Emergency Operations Center to send out invites to the upcoming planning meetings

Hazard Mitigation Plan Update Project Points of Contact (POCs)

Sussex County:

Joe Thomas
302-855-7801

The Olson Group, Ltd.

Adam Montella, Project Manager
813-657-5395

Anthony Mangeri Lead Planner
856-217-9172

Attendee List

The following individuals attended the Initial Planning Meeting.

Name	Organization	Phone Number	E-Mail
Joe Thomas	Sussex EOC	302-855-7801	jthomas@sussexcountyde.gov
Adam Montella	The Olson Group	813-657-5395	amontella@olsongroupltd.com
Hana Beckerle	The Olson Group	703-518-9982	hbeckerle@olsongroupltd.com
Anthony Mangeri	Mangeri Group	856-217-9172	amangeri@mangerigroup.com
Pete Dennen	Mangeri Group	609-922-5593	Pdennen44@gmail.com

HMP Steering Committee Initial Planning Meeting Agenda

1/20/2016

1. Introductions

2. Steering Committee / Working Group
   a. Steering Committee Responsibilities
   b. Working Group Responsibilities

3. Work Plan / General Schedule
   a. Proposed Work Plan
   b. Draft General Schedule
   c. Grant Performance Period

4. Data and Information
   a. GIS Capabilities
   b. Data / Information Requests

5. Next Steps
   a. Review of HAZUS run critical infrastructure information
   b. Collect and compile additional information to augment / highlight changes
   c. Initiate hazard identification and profiles
   d. Produce and distribute capability assessment survey

6. Project Administration
   a. Monthly Progress Reporting

DATA AND INFORMATION REQUESTS

The following is a list of data and information that would be helpful during the update evaluation of the Sussex County Delaware Hazard Mitigation Plan Update. Areas should focus on any areas that have changed in any degree since the plan was last approved. The assumption is much of this data or information either does not exist or is not available. However, anything that can be located and provided to the planning team will assist in the process. Highlighted items in particular would be helpful in the process of updating the issues related to each community. Conversely, this list should not be considered as exhaustive; any data or information that are of a similar nature or focus as the examples shown below would likely be of interest.

A. Data regarding the community

1. Floodplain mapping and / or studies including Digital Flood Insurance Rate Maps (DFIRMs) if available, inundation maps from past hazard events
2. Any existing lists of self- or state- identified critical facilities including HSIP (Homeland Security Infrastructure Protection)
3. Digital base maps with political boundaries (including special districts like schools, utilities, etc.), water features, roads (by use classification and ownership), topography, soils, physical geography, etc.
4. Studies, etc. (from organizations such as chamber of commerce, regional and/or local economic development authorities or councils of governments) that provide insight into development trends / patterns / rates (this could also include permit data from building departments in the various jurisdictions)

B. Data regarding public infrastructure

1. Insurance records (private, self-insured, State compilations, etc.) and/or any other records re: damages sustained from past hazard events including date, source of damages (i.e., hazard type), description and amount of damages to facilities, contents and length of time the facility was out of service
2. Any past mitigation projects completed or currently contemplated for facilities (including any related engineering studies)
3. Utility line locations, size / capacity, and type (above and below ground including party responsible for maintenance)
4. Sewer and water systems (including pump stations and any supporting infrastructure)
5. Flood management and pumping systems

C. Data regarding individual structures (public and private ownership)

1. Insurance records (private, self-insured, State compilations, etc.) and/or any other records re: damages sustained from past hazard events including date, source of damages (i.e., hazard type), description and amount of damages to structures, contents and length of time the structure was out of service
2. Any past mitigation projects ongoing, completed or currently contemplated for structures (including any related engineering studies)
3. Street address

4. Exact location (latitude/longitude and/or distinct planimetric feature in GIS)
5. Ownership
6. Age / date of construction
7. Construction type (i.e., wood frame, un-reinforced masonry, etc.)
8. Construction details (i.e., hazard specific information regarding flood proofing features, wind rating of windows)
9. First floor elevation
10. Number of floors
11. Square footage (total and floor by floor if available)
12. Assessed value
13. Market value
14. Replacement value
15. Use, e.g., in general land use categories such as "office / commercial", "single-family residential", etc. but also designating facilities that would be considered critical facilities (which may include facilities included in A.4 above) such as police stations, fire stations, EMS facilities, hospitals, communications towers, etc.)
16. Occupancy (e.g., rated capacity per Fire Marshall for public and commercial buildings, etc.)
17. Contents in terms of what, where and value (obvious things that would be good to know is the location of electrical equipment relative to flood elevations for the presence of hazardous materials, etc.)
18. Estimates of annual operating budgets of public operations / facilities
19. Current status (i.e., occupied, unoccupied, inhabitable, etc.)

D. Other Plans and Studies

1. Emergency Operations Plans, Continuity of Operations, Business Continuity Plans, Evacuation Plans etc.
2. Regional, County and/or Municipal Comprehensive Land Use and/or Zoning Plans and/or Maps

E. Miscellaneous information

1. Locations of facilities (and known transportation routes) that store or handle hazardous materials (some of which may show up as part of content listings for existing structures above per B.15).
2. Any demographic surveys or studies that would provide more current information about residents and/or property values.

PROJECT TIMELINE AND TASKS

Dates of specific meetings will be determined by the Steering Committee in conjunction with the Stakeholder Committee (Working Group) as the project is ongoing. This timeline will be adjusted as needed.

Task	# of Weeks/Month	Details
Project Management	Continuous throughout project	• Monthly status reports to the Sussex County Project Officer • Frequent communication and prompt reply to email and phone calls
Task 1 – Conduct Project Kickoff Meeting	Conducted within two weeks of contract execution	• Review scope of project • Identify a steering committee/planning team • Refine project schedule
Task 2 – Review Documents	• Weeks 2 through 4	• Review existing HMP • Review floodplain/other pertinent ordinances • Review other documents (e.g. land use, zoning, etc.)
Task 3 – Conduct Stakeholder Kick-off Meeting	• Week 5	• Introduce the project to public and private stakeholders • Provides first opportunity for municipal participation • Sets the stage for the planning effort
Task 4 – Update Risk Assessment	• Week 6 - Review with steering committee • *Weeks 7-Public Meeting*	• Update risk assessment • Produce hazard maps • Review during public meeting
Task 5 – Review and Update Mitigation Strategy	• Week 9 - Review with steering committee • *Week 10-Public Meeting*	• Update status of mitigation projects • Identify new projects for County/municipalities
Task 6 – Complete Revised Draft	• Week 13 - Draft complete	• Incorporates new risk assessment/mitigation strategy • Update all other plan parts
Task 7 – Review and Finalize Updated Draft	• Week 15 - Review with steering committee • Weeks 16 thru 19 Mandatory public comment period • Week 20 - *Public meeting*	• Ensure consistency throughout document • Make necessary changes
Task 8 – Submit Draft to DEMA	• Week 21 - Submit draft	• Submit via appropriate means (e.g. hard copy, electronic, etc.)
Task 9 – Submit Draft to FEMA Region IV	• Week 23 - Submit draft	• Submitted after initial review by DEMA
Task 10 – Facilitative Adoption	• Targeted for Week 27 - Following "received pending community adoption"	• Present to County/municipalities for formal adoption
Task 11 – Conduct Close-out Meeting	• Week 27 - 29	

Multi-Jurisdiction Hazard Mitigation Plan Update Initial Planning Meeting

Today's Agenda

- Introductions
- Steering Committee & Working Group
- Hazard Mitigation Planning Overview
- Work Plan / General Schedule
- Data & Information Needs
- Next Steps
- Project Administration
- Next Meeting / Action Items

Welcome and Introductions

- Sussex County Steering Committee
- Sussex County Working Group
- Sussex County Emergency Operations
- Participating LEPC Members
- Special Districts and Organizations
- Contractor Team

Welcome and Introductions

- Name, Position, Organization
- Previous Experience in Hazard Mitigation Planning or Implementation?
- Specialized area for inclusion within the plan update

Multi-Jurisdiction Hazard Mitigation Plan Update Overview

Project Types Review

Potential Mitigation Projects

"Soft" Mitigation Projects:

- Building code enforcement
- Land development regulations
- Public education
- Studies and plans
- More…

Potential Mitigation Projects

"Hard" Mitigation Projects or "Property Protection" Construction:

- Acquisition / elevation / mitigation reconstruction of structures
- Retrofits for high wind loads such as installing hurricane shutters
- Improving drainage
- More…

Acquisition

- Most cost-effective mitigation measure.
- Permanently removes vulnerable property from the floodplain.

"No way did I want to sandbag again," says Joe Moore, visiting the site where his house once stood. "1993 was my last flood."

Taken from *Missouri Buyout Program 2002*

Acquisition

- The structure is demolished or relocated and the land is dedicated as open space in perpetuity.
- Requires willing sellers and communities.

"No way did I want to sandbag again," says Joe Moore, visiting the site where his house once stood. "1993 was my last flood."

Taken from *Missouri Buyout Program 2002*

Elevation

- Raising a structure above the Base Flood Elevation.
- Building size, structural integrity, and type of foundation must be considered.
- There are different types of elevation which can be used depending on the structure.

Top Picture: A house in Miami in the process of being elevated.

Bottom Picture: That same house once completed.

Taken from FEMA, *Above the Flood, 2000*

Mitigation Reconstruction

- Pilot program funded under Disaster Declarations 1603 and 1607 (Hurricanes Katrina and Rita)
- If acquisition and elevation are not feasible then a structure may be demolished and reconstructed at the same location meeting current construction codes and standards.

Hardening or Retrofitting of Critical Facilities

Potential Projects for public buildings, hospitals and health care facilities, utilities, police stations, fire stations, emergency operations center, jails and detention centers, and schools:

- Install shutters or impact resistant glass on windows
- Strengthen the doors.
- Install hurricane straps and clips to strengthen roof.
- Bolt walls to foundation.
- Relocate utility lines underground.
- Elevate the heating, ventilating and cooling (HVAC) equipment, such as furnace and hot water heater.

Hardening or Retrofitting of Critical Facilities

Install Shutters or Impact Resistant Glass on Windows

Accordion Shutters

Roll-Down Shutters

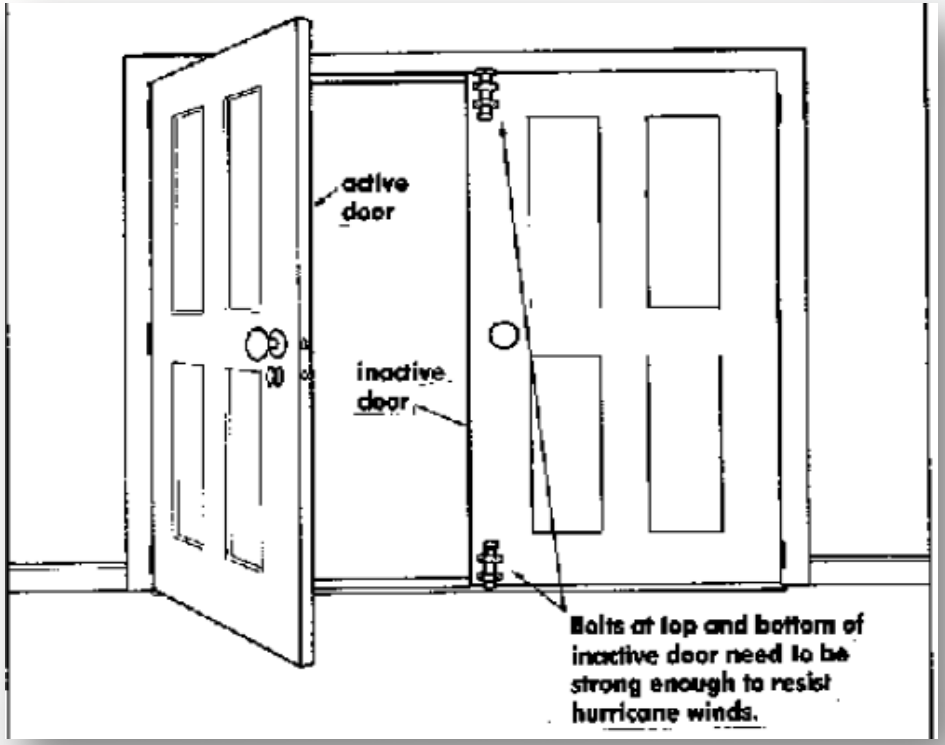
Colonial Shutters

Impact Resistant Glass

Corrugated Metal Panel

Hardening or Retrofitting of Critical Facilities

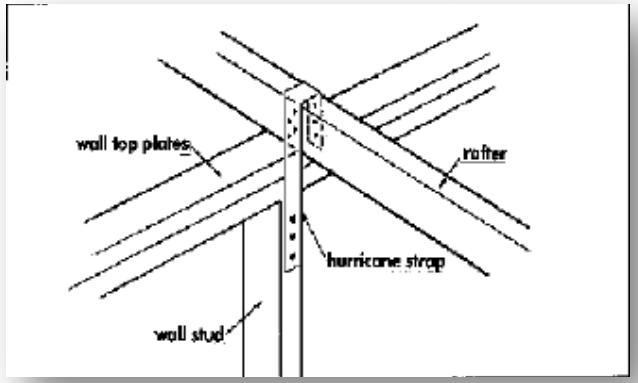
Strengthen the Doors



From *Against the Wind*

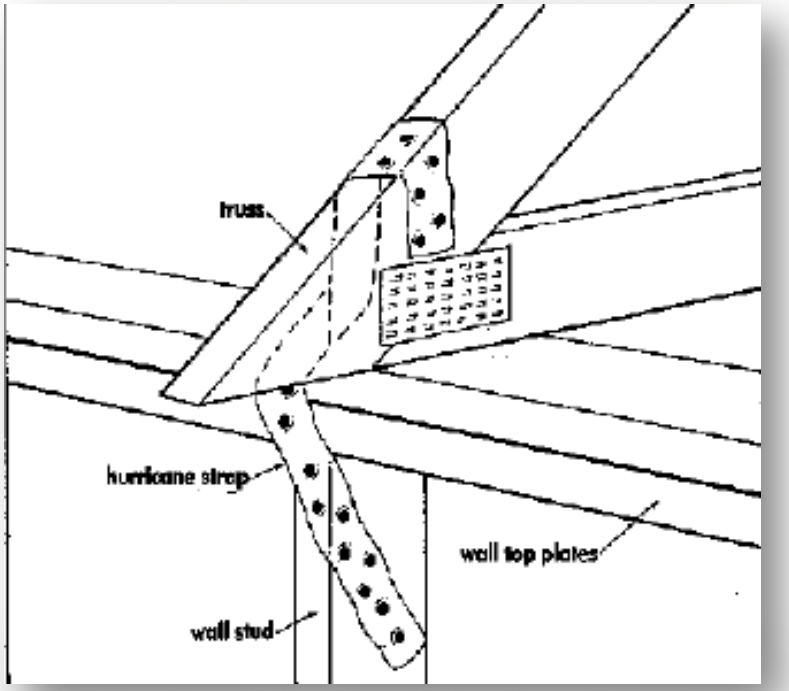
Hardening or Retrofitting of Critical Facilities

Install Hurricane Straps and Clips to Strengthen the Roof



From *Against the Wind*

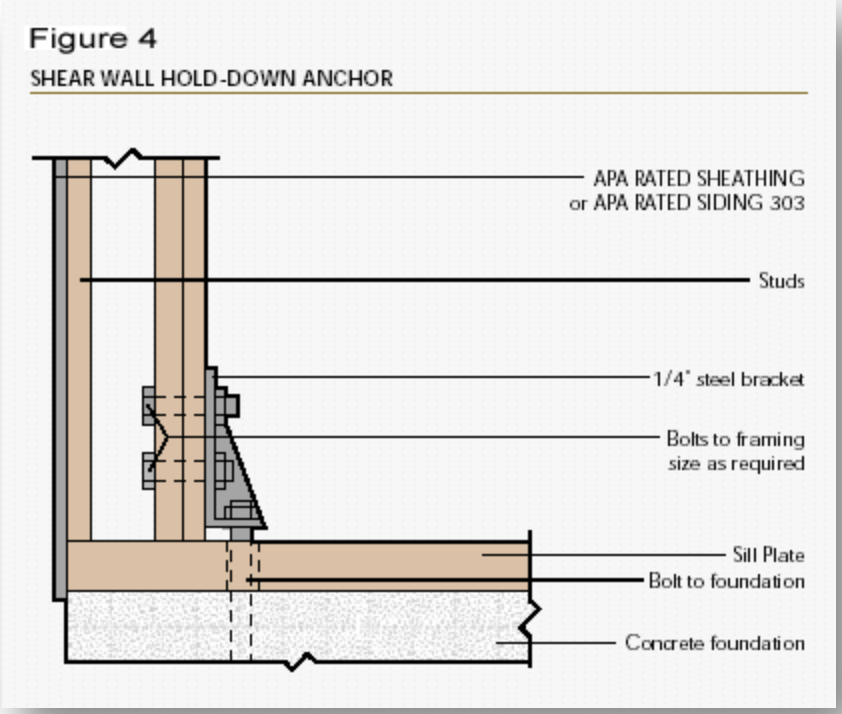
From *The Advocate*



From *Against the Wind*

Hardening or Retrofitting of Critical Facilities

Bolt Walls to Foundation



From www.townparkconstruction.com

Hardening or Retrofitting of Critical Facilities

Relocate Utility Lines Underground

Fallen utility lines after Wilma. From www.galtmile.com

Hardening or Retrofitting of Critical Facilities

Elevate The Heating, Ventilating and Cooling (HVAC) Equipment, Such as Furnace and Hot Water Heater

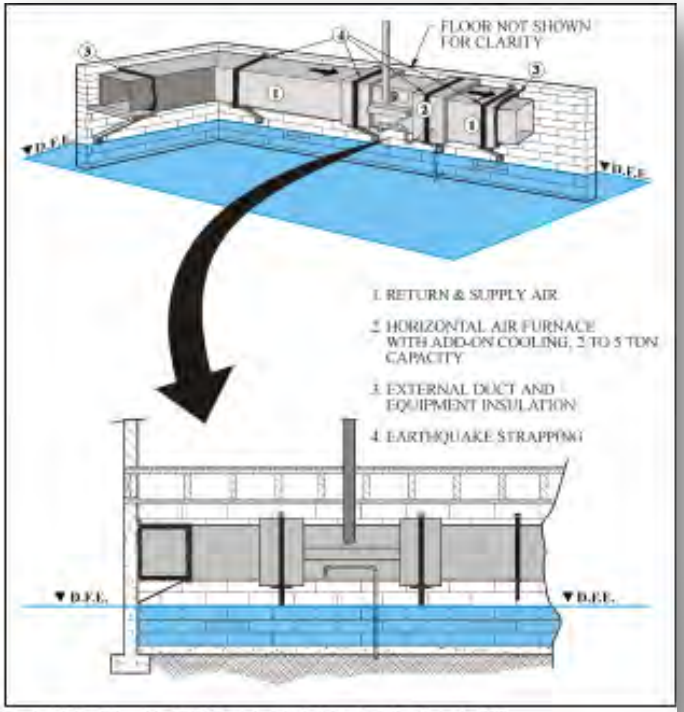


Figure 3.1.4A: Elevation of HVAC components below a floor, but above the DFE

From FEMA, *Protecting Building Utilities*

Hardening or Retrofitting of Critical Facilities

Potential projects for pump stations, water control facilities, water treatment and delivery systems, power generation facilities, sewage collection and treatment facilities:

- Install backflow valves.
- Elevate the generators and pumps.
- Anchor fuel tanks.
- Eliminate infiltration problems with underground utility systems.

Drainage Improvements

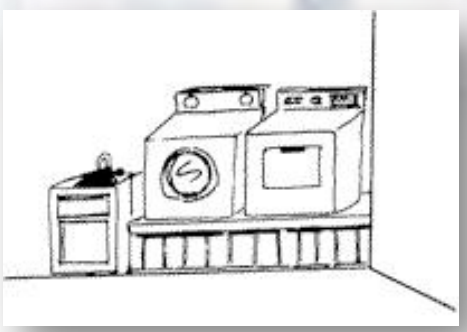
- Creating detention/ retention ponds and reservoirs.
- Building floodwalls and diversions.
- Constructing storm sewers and increasing culvert capacity.
- Maintenance is not an eligible project.

Retention Pond in North Carolina

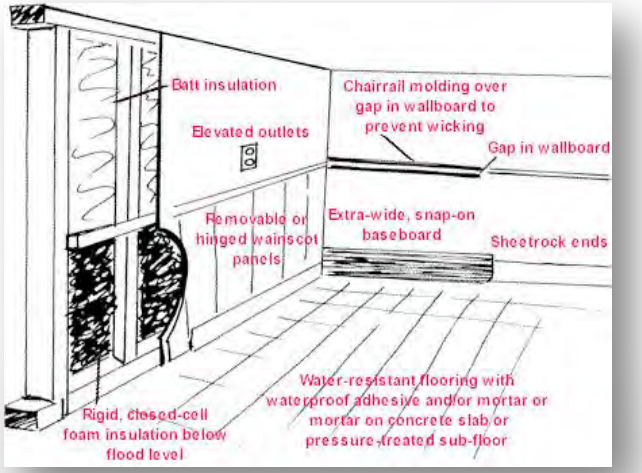
A culvert

Wet Floodproofing

- Modifying uninhabited portions of the structure to allow floodwaters to enter without causing significant damage.
- Materials must be water resistant.
- Not practical for most slab-on-grade structures with living space near ground level.



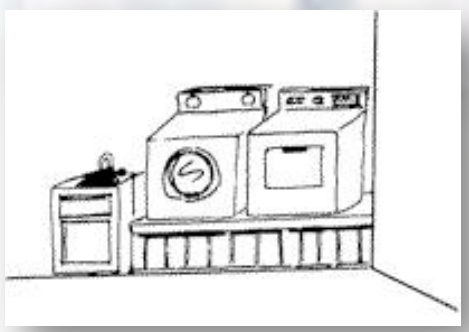
Elevated Appliances from www.louisianafloods.org



From www.louisianafloods.org

Wet Floodproofing

- Does not reduce damage from high velocity floods.
- Only appropriate in limited situations.



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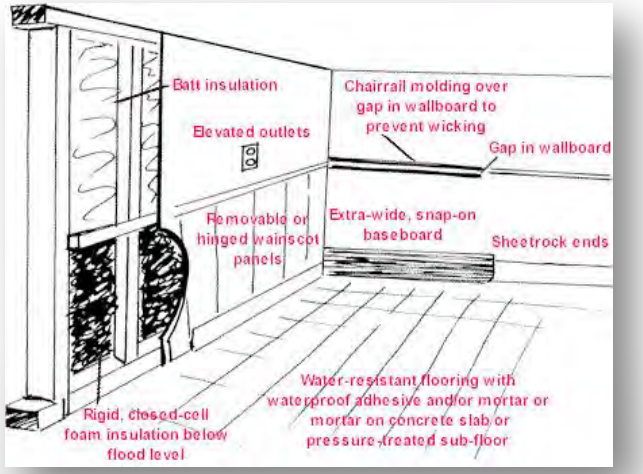
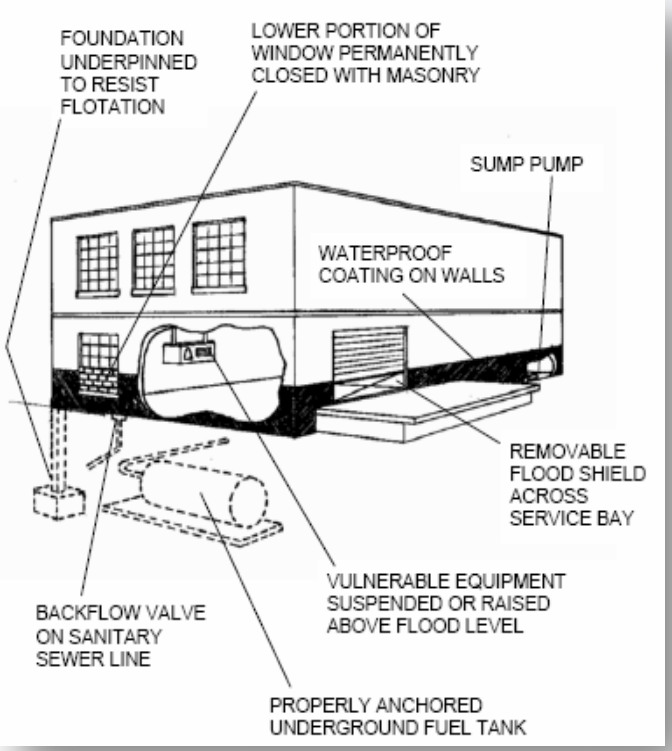


From www.louisianafloods.org

Dry Floodproofing

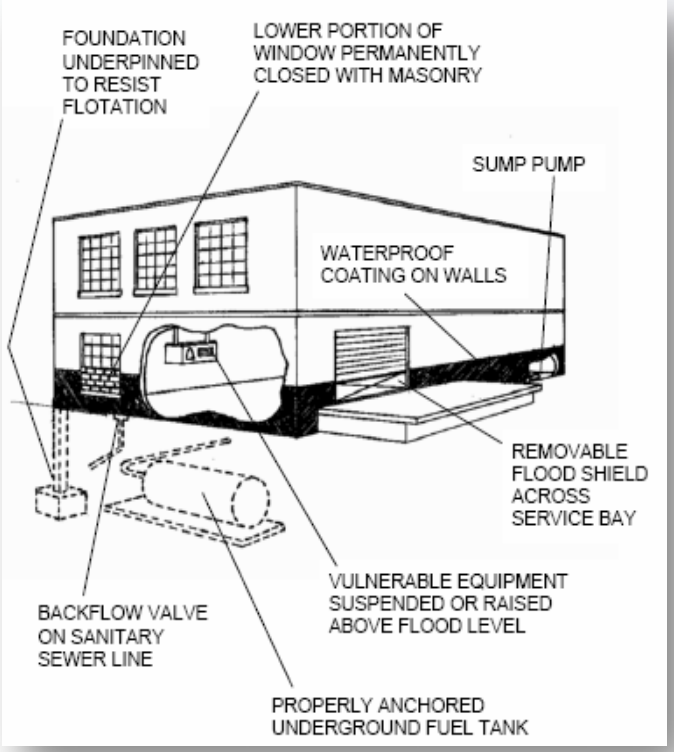
- Making the structure watertight below the level that needs flood protection.
- Requires sealing the walls and providing waterproof closures for any openings such as doors.



From FEMA, *Protecting Your Business from Flooding*

Dry Floodproofing

- Effective for low duration flooding with depths under 3 feet.
- Not effective for high velocity flooding.



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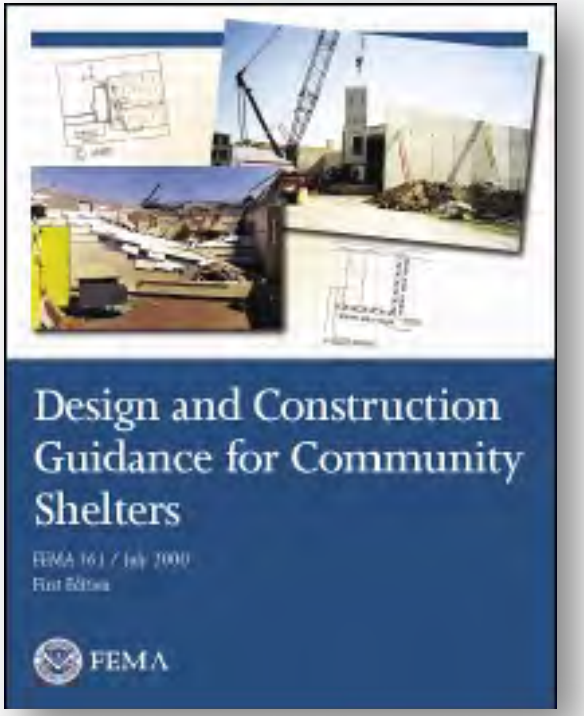
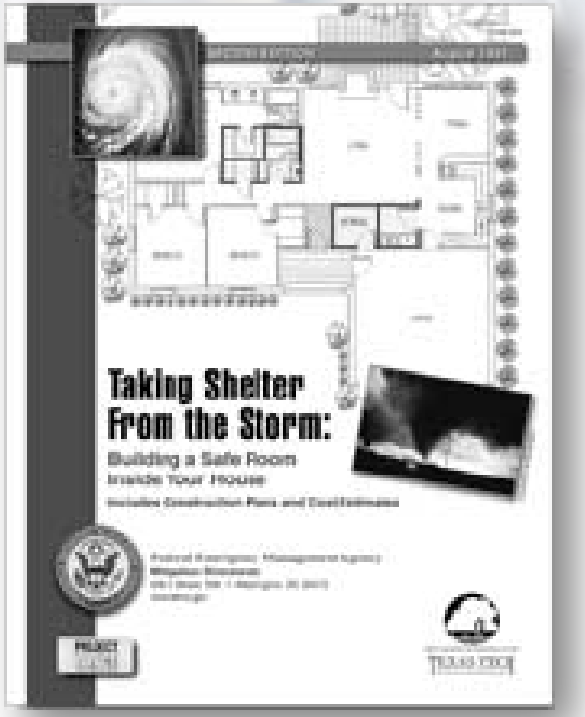
Community Shelters

- A structure built to withstand extreme winds and flying debris from tornadoes, hurricanes, and other storms that is accessible to the public.
- Guidelines can be found in FEMA 361.
- The shelter cannot be used for anything else.



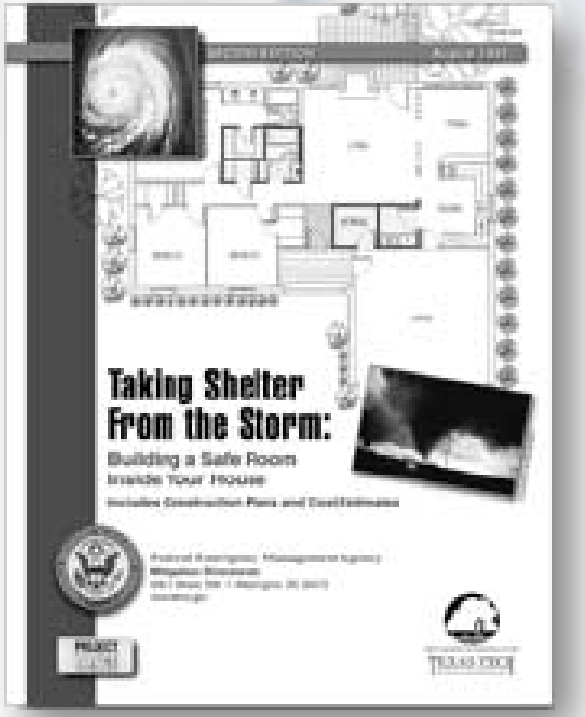
Safe Rooms

- Can be built on-site, or manufactured.
- Can be installed in new or existing homes.
- Must have adequate ventilation.
- Guidelines are outlined in FEMA Publication 320



Safe Rooms

- Must be securely anchored to the foundation and structurally isolated from the main structure.
- Can be on the first floor, in a basement, or outside.
- Guidelines are outlined in FEMA Publication 320



5% Initiative Mitigation Projects

5% Initiative Projects eligible for funding can include new, unproven mitigation techniques and technologies where benefits are not proven or not clearly measurable:

- Generators; or
- Disaster warning equipment and systems.

Municipal Participation

Municipal Participation

- Responding to data and document requests
- Completing Capability Assessment
- Reviewing and editing Critical Facility inventories
- Project review, identification and prioritization

Municipal Participation

- Attendance at regularly scheduled local Mitigation coordination meetings
- A commitment to read plan materials and to participate in the joint planning process
- Plan adoption (at the end of the process)

Municipal Participation

Implications

- Pre-disaster hazard mitigation grant programs
- Post-disaster public assistance and hazard mitigation grant programs

General Schedule

Project Management	Continuous throughout project	Officer Frequent communication and prompt reply to email and phone calls
Task 1 – Conduct Project Kickoff Meeting	Conducted within two weeks of contract execution	• Review scope of project • Identify a steering committee/planning team • Refine project schedule
Task 2 – Review Documents	Weeks 2 through 4	• Review existing HMP • Review floodplain/other pertinent ordinances • Review other documents (e.g. land use, zoning, etc.)
Task 3 – Conduct Stakeholder Kick-off Meeting	• Week 5	• Introduce the project to public and private stakeholders • Provides first opportunity for municipal participation • Sets the stage for the planning effort
Task 4 – Update Risk Assessment	Week 6 - Review with steering committee Weeks 7-Public Meeting	Update risk assessment Produce hazard maps Review during public meeting
Task 5 – Review and Update Mitigation Strategy	• Week 9 - Review with steering committee • Week 10-Public Meeting	• Update status of mitigation projects • Identify new projects for County/municipalities
Task 6 – Complete Revised Draft	Week 13 - Draft complete	Incorporates new risk assessment/mitigation strategy Update all other plan parts
Task 7 – Review and Finalize Updated Draft	• Week 15 - Review with steering committee • Weeks 16 thru 19 Mandatory public comment period • Week 20 - Public meeting	• Ensure consistency throughout document • Make necessary changes
Task 8 – Submit Draft to DEMA	• Week 21 - Submit draft	• Submit via appropriate means (e.g. hard copy, electronic, etc.)
Task 9 – Submit Draft to FEMA Region IV	• Week 23 - Submit draft	• Submitted after initial review by DEMA
Task 10 – Facilitative Adoption	Targeted for Week 27 - Following "received pending community adoption"	• Present to County/municipalities for formal adoption
Task 11 – Conduct Close-out Meeting	• Week 27 - 29	

Work-in-Progress

Work-in-Progress

- Data/Information Requests
- Public Participation
- Hazard Identification Review
- Hazard Profiling

Next Steps

Municipal Participation

Implications

- Pre-disaster hazard mitigation grant programs

- Post-disaster public assistance and hazard mitigation grant programs

Next Steps

- Data Acquisition
- Review of Current HAZUS
- Hazard Identification Review & Profiling
- Capability Assessment Survey

Project Administration

- Force Account / In-Kind Services Documentation
- Monthly Progress Reporting

Meeting Schedule

- Steering Committee Meetings
- Working Group Meetings
- Public Hearings

Questions and Comments

HMP Steering Committee Initial Planning Meeting Minutes

1/20/2015

Date and Location. A Hazard Mitigation Plan (HMP) Steering Committee Initial Planning Meeting (IPM) was held on January 20, 2016 at 2:00 PM to begin the Sussex County Hazard Mitigation Plan Update Project.

Participants. HMP Steering Committee IPM attendees included representatives from the following organizations:

- Sussex County Emergency Operations Center (EOC)
- Delaware Emergency Management Agency (DEMA)
- Sussex County LEPC Floodplain Manager
- Sussex County GIS
- The Olson Group, LTD (OGL)
- The Mangeri Group L.L.C.

Purpose. The purpose of the HMP Steering Committee IPM was to introduce the HMP Steering Committee to the HMP Update Project and discuss the timeline and process for the project. Discussion and agreements made between meeting attendees during the meeting are provided below.

Overview of Activities

Status of HMP Grant Extension Request to DEMA/FEMA: Joe Thomas from the Sussex County Emergency Operations Center gave welcome remarks and briefed the meeting attendees of the status of the HMP Grant extension request. Mr. Thomas prepared a formal request to DEMA and FEMA to extend the grant funding for this project. FEMA is expected to approve a six-month extension, which will provide a buffer of two additional months based on the revised project timeline.

Introduction of Steering Committee Members: Members of the Steering Committee introduced themselves and their role in hazard mitigation efforts in Sussex County.

Project Process and Future Meetings: Mr. Adam Montella and Mr. Mangeri, Sr. MPA, CPM, CEM discussed the project process. The project team will attempt to hold future public meetings for both the Steering Committee and Working Group in conjunction with existing meetings in order to maximize stakeholder engagement. The HMP Update process must be transparent to the public, and all meetings and documentation will be available to the public through the county website and other avenues.

Data and Information Request Process: The project team will work with the Steering Committee and Stakeholder Working Group to gather the information and data necessary to complete the plan update. Updated information on critical facilities will be used to do a tier two

HAZUS run. Other information gathered will include the sector for each identified critical facility (transportation, health, etc.), the repetitive loss inventory from county Floodplain Management, the participating National Flood Insurance Program (NFIP) jurisdictions, and current local hazard mitigation ordinances, projects and strategies.

DEMA will be included throughout out the process in order to get incremental approval of the HMP update.

Future Planning Conferences. Additional meetings will be scheduled as the project progresses. The project team will attempt to schedule meetings during or in conjunction with existing meetings in an effort to and maximize stakeholder attendance and engagement.

Outstanding Actions

The following actions remain:

- OGL to send out Minutes from this meeting
- OGL and Mangeri Group to develop meeting agendas and prepare read-ahead materials for future planning meetings
- OGL and Mangeri Group to continue review and analysis of the current Sussex County Hazard Mitigation Plan
- OGL and Mangeri Group to begin outreach to gather data from Stakeholder Working Group and other stakeholders
- OGL, Mangeri Group and Sussex County Emergency Operations Center to schedule future planning meetings with the Stakeholder Working Group
- Sussex County Emergency Operations Center to confirm HMP grant extension from DEMA/FEMA
- Sussex County GIS to provide relevant data to OGL and Mangeri Group within three weeks

Hazard Mitigation Plan Update Project Points of Contact (POCs)

Sussex County:

Joe Thomas
302-855-7801

The Olson Group, Ltd.

Adam Montella, Project Manager
813-657-5395

Anthony Mangeri, Sr. MPA, CPM, CEM Lead Planner
856-217-9172

Attendee List

The following individuals attended the Initial Planning Meeting.

Name	Organization	Phone Number	E-Mail
Art Paul	DEMA	302-659-2253	Arthur.paul@state.de.us
Ed Strouse	DEMA	302-659-2214	Edward.strouse@state.de.us
Anthony Mangeri, Sr. MPA, CPM, CEM	Mangeri Group L.L.C.	856-217-9172	amangeri@mangerigroup.com
Joe Thomas	Sussex County EOC	302-855-7801	jthomas@sussexcountyde.gov
Charles Stevenson	Sussex County EOC	302-855-7800	cstevenson@sussexcountyde.gov
Jeff Shockley	Sussex County Floodplain Mgmt.	302-855-7884	jcshockley@sussexcountyde.gov
Megan Nehrbas	Sussex County GIS	302-855-1176	mnehrbas@sussexcountyde.gov
Adam Montella	The Olson Group	813-657-5395	amontella@olsongroupltd.com
Hana Beckerle	The Olson Group	703-518-9982	hbeckerle@olsongroupltd.com

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update
Steering Committee Initial Planning Meeting
January 20, 2016

SIGN-IN SHEET

Name	Title	Organization	Phone	Email
Art Paul	Planner	DEMA	659-2253	arthur.paul@state.de.us
Ed Strouse	DEMA Supervisor	DEMA	659-2214	edward.strouse@state.de.us
Jeff Sholdey	Floodplain Manager	Sussex County	302-855-7884	jsholdey@sussexcountyde.gov
Charles Stevenson	Sussex EEPC	Sussex County	302-855-7810	cstevenson@sussexcountyde.gov
Adam Montella	Project Manager	OGL	813-657-5395	amontella@oglgroup.com
Megan Nehrbas	GIS Manager	Sussex Co.	3028551176	mnehrbas@sussexcountyde.gov
Anthony S. Mangeri, CFM	Mitigation Planner	OGL (Mangeri Group)	856217-9172	AMangeri@mangerigroup.com
Hana Beckerle	Planner/Project Support	OGL	703-518-9782	hbeckerle@oglgroup.com
Joe Thomas	Director	Sussex EOC	302-855-7801	jthomas@sussexcountyde.gov

HMP Working Group Initial Planning Meeting Agenda

1/20/2016

1. Introductions

2. Steering Committee / Working Group
   a. Steering Committee Responsibilities
   b. Working Group Responsibilities

3. Work Plan / General Schedule
   a. Proposed Work Plan
   b. Draft General Schedule
   c. Grant Performance Period

4. Data and Information
   a. GIS Capabilities
   b. Data / Information Requests

5. Next Steps
   a. Review of HAZUS run critical infrastructure information
   b. Collect and compile additional information to augment / highlight changes
   c. Initiate hazard identification and profiles
   d. Produce and distribute capability assessment survey

6. Project Administration
   a. Monthly Progress Reporting

PROJECT TIMELINE AND TASKS

Dates of specific meetings will be determined by the Steering Committee in conjunction with the Stakeholder Committee (Working Group) as the project is ongoing. This timeline will be adjusted as needed.

Task	# of Weeks/Month	Details
Project Management	Continuous throughout project	• Monthly status reports to the Sussex County Project Officer • Frequent communication and prompt reply to email and phone calls
Task 1 – Conduct Project Kickoff Meeting	Conducted within two weeks of contract execution	• Review scope of project • Identify a steering committee/planning team • Refine project schedule
Task 2 – Review Documents	• Weeks 2 through 4	• Review existing HMP • Review floodplain/other pertinent ordinances • Review other documents (e.g. land use, zoning, etc.)
Task 3 – Conduct Stakeholder Kick-off Meeting	• Week 5	• Introduce the project to public and private stakeholders • Provides first opportunity for municipal participation • Sets the stage for the planning effort
Task 4 – Update Risk Assessment	• Week 6 - Review with steering committee • *Weeks 7-Public Meeting*	• Update risk assessment • Produce hazard maps • Review during public meeting
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DATA AND INFORMATION REQUESTS

The following is a list of data and information that would be helpful during the update evaluation of the Sussex County Delaware Hazard Mitigation Plan Update. Areas should focus on any areas that have changed in any degree since the plan was last approved. The assumption is much of this data or information either does not exist or is not available. However, anything that can be located and provided to the planning team will assist in the process. Highlighted items in particular would be helpful in the process of updating the issues related to each community. Conversely, this list should not be considered as exhaustive; any data or information that are of a similar nature or focus as the examples shown below would likely be of interest.

A. Data regarding the community

1. Floodplain mapping and / or studies including Digital Flood Insurance Rate Maps (DFIRMs) if available, inundation maps from past hazard events
2. Any existing lists of self- or state- identified critical facilities including HSIP (Homeland Security Infrastructure Protection)
3. Digital base maps with political boundaries (including special districts like schools, utilities, etc.), water features, roads (by use classification and ownership), topography, soils, physical geography, etc.
4. Studies, etc. (from organizations such as chamber of commerce, regional and/or local economic development authorities or councils of governments) that provide insight into development trends / patterns / rates (this could also include permit data from building departments in the various jurisdictions)

B. Data regarding public infrastructure

1. Insurance records (private, self-insured, State compilations, etc.) and/or any other records re: damages sustained from past hazard events including date, source of damages (i.e., hazard type), description and amount of damages to facilities, contents and length of time the facility was out of service
2. Any past mitigation projects completed or currently contemplated for facilities (including any related engineering studies)
3. Utility line locations, size / capacity, and type (above and below ground including party responsible for maintenance)
4. Sewer and water systems (including pump stations and any supporting infrastructure)
5. Flood management and pumping systems

C. Data regarding individual structures (public and private ownership)

1. Insurance records (private, self-insured, State compilations, etc.) and/or any other records re: damages sustained from past hazard events including date, source of damages (i.e., hazard type), description and amount of damages to structures, contents and length of time the structure was out of service
2. Any past mitigation projects ongoing, completed or currently contemplated for structures (including any related engineering studies)
3. Street address

4. Exact location (latitude/longitude and/or distinct planimetric feature in GIS)
5. Ownership
6. Age / date of construction
7. Construction type (i.e., wood frame, un-reinforced masonry, etc.)
8. Construction details (i.e., hazard specific information regarding flood proofing features, wind rating of windows)
9. First floor elevation
10. Number of floors
11. Square footage (total and floor by floor if available)
12. Assessed value
13. Market value
14. Replacement value
15. Use, e.g., in general land use categories such as "office / commercial", "single-family residential", etc. but also designating facilities that would be considered critical facilities (which may include facilities included in A.4 above) such as police stations, fire stations, EMS facilities, hospitals, communications towers, etc.)
16. Occupancy (e.g., rated capacity per Fire Marshall for public and commercial buildings, etc.)
17. Contents in terms of what, where and value (obvious things that would be good to know is the location of electrical equipment relative to flood elevations for the presence of hazardous materials, etc.)
18. Estimates of annual operating budgets of public operations / facilities
19. Current status (i.e., occupied, unoccupied, inhabitable, etc.)

D. Other Plans and Studies

1. Emergency Operations Plans, Continuity of Operations, Business Continuity Plans, Evacuation Plans etc.
2. Regional, County and/or Municipal Comprehensive Land Use and/or Zoning Plans and/or Maps

E. Miscellaneous information

1. Locations of facilities (and known transportation routes) that store or handle hazardous materials (some of which may show up as part of content listings for existing structures above per B.15).
2. Any demographic surveys or studies that would provide more current information about residents and/or property values.

Multi-Jurisdiction Hazard Mitigation Plan Update
Initial Planning Meeting

Today's Agenda

- Introductions
- Steering Committee & Working Group
- Hazard Mitigation Planning Overview
- Work Plan / General Schedule
- Data & Information Needs
- Next Steps
- Project Administration
- Next Meeting / Action Items

Welcome and Introductions

- Sussex County Steering Committee
- Sussex County Working Group
- Sussex County Emergency Operations
- Participating LEPC Members
- Special Districts and Organizations
- Contractor Team

Potential Mitigation Projects

"Soft" Mitigation Projects:

- Building code enforcement
- Land development regulations
- Public education
- Studies and plans
- More…

Potential Mitigation Projects

"Hard" Mitigation Projects or "Property Protection" Construction:

- Acquisition / elevation / mitigation reconstruction of structures
- Retrofits for high wind loads such as installing hurricane shutters
- Improving drainage
- More…

Acquisition

- Most cost-effective mitigation measure.
- Permanently removes vulnerable property from the floodplain.

"No way did I want to rebuild again," says Joe Moore, visiting the site where his house once stood. "1993 was my last flood."

Taken from Missouri Buyout Program 2002

Hardening or Retrofitting of Critical Facilities

Potential Projects for public buildings, hospitals and health care facilities, utilities, police stations, fire stations, emergency operations center, jails and detention centers, and schools:

- Install shutters or impact resistant glass on windows
- Strengthen the doors.
- Install hurricane straps and clips to strengthen roof.
- Bolt walls to foundation.
- Relocate utility lines underground.
- Elevate the heating, ventilating and cooling (HVAC) equipment, such as furnace and hot water heater.

Hardening or Retrofitting of Critical Facilities

Install Shutters or Impact Resistant Glass on Windows

Accordion Shutters

Roll-Down Shutters

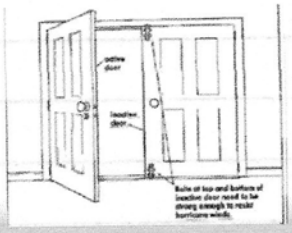
Impact Resistant Glass

Colonial Shutters

Corrugated Metal Panel

Hardening or Retrofitting of Critical Facilities

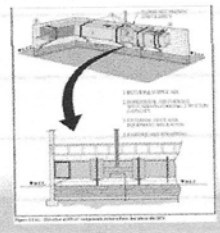
Strengthen the Doors



From *Against the Wind*

Hardening or Retrofitting of Critical Facilities

Elevate The Heating, Ventilating and Cooling (HVAC) Equipment, Such as Furnace and Hot Water Heater



From FEMA, *Protecting Building Utilities*

Hardening or Retrofitting of Critical Facilities

Potential projects for pump stations, water control facilities, water treatment and delivery systems, power generation facilities, sewage collection and treatment facilities:

- Install backflow valves.
- Elevate the generators and pumps.
- Anchor fuel tanks.
- Eliminate infiltration problems with underground utility systems.

Drainage Improvements

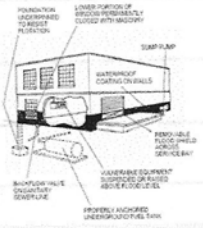
- Creating detention/retention ponds and reservoirs.
- Building floodwalls and diversions.
- Constructing storm sewers and increasing culvert capacity.
- Maintenance is not an eligible project.

Retention Pond in North Carolina

A culvert

Dry Floodproofing

- Effective for low duration flooding with depths under 3 feet.
- Not effective for high velocity flooding.



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- Guidelines can be found in FEMA 361.
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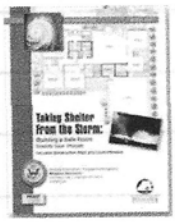

Municipal Participation

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- Reviewing and editing Critical Facility inventories
- Project review, identification and prioritization

Municipal Participation

- Attendance at regularly scheduled local Mitigation coordination meetings
- A commitment to read plan materials and to participate in the joint planning process
- Plan adoption (at the end of the process)

Municipal Participation

Implications

- Pre-disaster hazard mitigation grant programs
- Post-disaster public assistance and hazard mitigation grant programs

Work-in-Progress

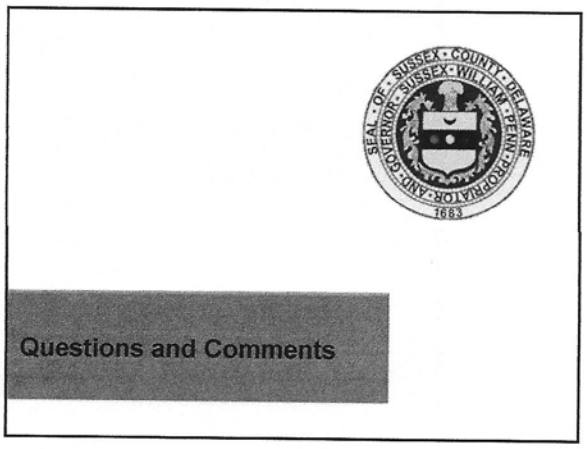
- Data/Information Requests
- Public Participation
- Hazard Identification Review
- Hazard Profiling

Next Steps

Municipal Participation

Implications

- Pre-disaster hazard mitigation grant programs
- Post-disaster public assistance and hazard mitigation grant programs


SEAL · OF · SUSSEX · COUNTY · DELAWARE
SUSSEX · WILLIAM · PENN · PROPRIATOR · AND · GOVERNOR
1683
Questions and Comments

HMP Stakeholder Working Group Initial Planning Meeting Minutes

1/20/2015

Date and Location. A Hazard Mitigation Plan (HMP) Stakeholder Working Group Initial Planning Meeting (IPM) was held on January 20, 2016 at 3:00 PM to begin the Sussex County Hazard Mitigation Plan Update Project.

Participants. HMP Working Group IPM attendees included representatives from the following organizations:

- City of Rehoboth Beach
- Department of Natural Resources and Environmental Control (DNREC)
- Ocean View
- Seaford
- Selbyville
- Sussex County Emergency Operations Center (EOC)
- Sussex County GIS
- Sussex County LEPC Floodplain Manager
- The Mangeri Group L.L.C.
- The Olson Group, Ltd. (OGL)
- Town of Henlopen Acres
- Town of Laurel
- Town of Slaughter Beach
- Town of South Bethany
- University of Delaware

Purpose. The purpose of the HMP Working Group IPM was to introduce the HMP Stakeholder Working Group to the HMP Update project and discuss the timeline and process for the project. Discussion and agreements made between meeting attendees during the meeting are provided below.

Overview of Activities

Welcome Remarks: Joe Thomas from the Sussex County Emergency Operations Center gave welcome remarks and discussed the purpose of the HMP Update project.

Introduction of Stakeholder Working Group Members: Members of the Working Group introduced themselves.

Project Process and Future Meetings: Mr. Adam Montella and Mr. Anthony Mangeri, Sr., MPA, CPM, CEM discussed the project process. The project team will attempt to hold future meetings for the Working Group in conjunction with existing meetings in order to maximize stakeholder engagement. The HMP Update process must be transparent to the public, and all meetings and documentation will be available to the public through the county website and other avenues.

Data and Information Request Process: The project team will work with the Stakeholder Working Group to gather the information and data necessary to complete the plan update. Updated information on critical facilities will be used to do a tier two HAZUS run. Other information gathered will include the sector for each identified critical facility (transportation, health, etc.), the repetitive loss inventory from county Floodplain Management, the participating National Flood Insurance Program (NFIP) jurisdictions, and current local hazard mitigation ordinances, projects and strategies.

Mr. Mangeri discussed mitigation strategies and efforts that may be included in jurisdiction data, such as acquisition of vulnerable facilities, elevation, mitigation reconstruction, hardening and retrofitting facilities, drainage improvements, floodproofing, mitigation for community shelters, and safe rooms.

The current County Hazard Mitigation Plan can be found on the Sussex County Emergency Operations Center website at the following address:

http://www.sussexcountyde.gov/sites/default/files/PDFs/SussexCounty_March2010_HMP_Update.pdf.

Municipal Participation. Mr. Mangeri discussed the expectations for municipal participation during the HMP Update. Municipalities will respond to data a document requests, complete capability assessments, review and edit critical facility inventories, attend regularly scheduled mitigation coordination meetings, review and provide comment on plan materials and the updated draft plan, and adopt the plan at the end of the update process.

Project Timeline. The HMP Update will tentatively be held over a 29-week timeframe, pending the approval of a grant extension. The current project timeline was distributed to Stakeholder Working Group IPM attendees.

Future Planning Conferences. Additional meetings will be scheduled as the project progresses. The project team will attempt to schedule meetings during or in conjunction with existing meetings in an effort to and maximize stakeholder attendance and engagement.

Outstanding Actions

The following actions remain:

- OGL to send out Minutes from this meeting
- OGL and Mangeri Group to develop meeting agendas and prepare read-ahead materials for future planning meetings
- OGL and Mangeri Group to continue review and analysis of the current Sussex County Hazard Mitigation Plan
- OGL and Mangeri Group to begin outreach to gather data from Stakeholder Working Group and other stakeholders

- OGL, Mangeri Group and Sussex County Emergency Operations Center to schedule future planning meetings with the Stakeholder Working Group
- Sussex County Emergency Operations Center to confirm HMP grant extension from DEMA/FEMA
- Sussex County GIS to provide relevant data to OGL and Mangeri Group within three weeks
- Working Group to provide names and contact information for other representatives from their organization who will be involved in the planning process

Hazard Mitigation Plan Update Project Points of Contact (POCs)

Sussex County:

Joe Thomas
302-855-7801

The Olson Group, Ltd.

Adam Montella, Project Manager
813-657-5395

Anthony Mangeri, Sr. MPA, CPM, CEM Lead Planner
856-217-9172

Attendee List

The following individuals attended the Initial Planning Meeting.

Name	Organization	Phone Number	E-Mail
Keith Banks	City of Rehoboth Beach	302-227-2577	Keith.banks@cj.state.de.us
Greg Williams	DNREC	302-739-9921	Gregory.williams@state.de.us
Janice Shute	DNREC	302-739-9921	Janice.shute@state.de.us
Anthony Mangeri, Sr. MPA, CPM, CEM	Mangeri Group L.L.C.	856-217-9172	amangeri@mangerigroup.com
Charles McMullen	Ocean View	302-539-1208	admintov@oceanviewde.com
Charles Anderson	Seaford	302-629-9173	canderson@seaford.com
Michael S. Deal	Selbyville	302-436-8314	tmselbyville@mchsi.com
Joe Thomas	Sussex County EOC	302-855-7801	jthomas@sussexcountyde.gov
Charles Stevenson	Sussex County EOC	302-855-7800	cstevenson@sussexcountyde.gov
Jeff Shockley	Sussex County Floodplain Mgmt.	302-855-7884	jcshockley@sussexcountyde.gov
Megan Nehrbas	Sussex County GIS	302-855-1176	mnehrbas@sussexcountyde.gov
Joel Marshall	Sussex County GIS	302-875-2277	Joel.marshall@sussexcountyde.gov
Mark Deau	Sussex County GIS	302-855-1176	mdeau@sussexcountyde.gov
Adam Montella	The Olson Group	813-657-5395	amontella@olsongroupltd.com

Name	Organization	Phone Number	E-Mail
Hana Beckerle	The Olson Group	703-518-9982	hbeckerle@olsongroupltd.com
Thomas Roth	Town of Henlopen Acres	302-227-6411	townmgr@henlopenacres.com
Sgt. Adam Hitchens	Town of Laurel	302-875-2244	Adam.hitchens@cj.state.de.us
James Fosky	Town of Laurel	302-875-2277	laurelpwd@comcast.net
Jamie Smith	Town of Laurel	302-875-2277	laureltm@comcast.net
Bob Wood	Town of Slaughter Beach	443-845-6509	Woodduck418@gmail.com
Melvin Cusick	Town of South Bethany	302-539-3653	townmanager@southbethany.org
Mark Seifert	University of Delaware	302-831-7394	seifert@udel.edu

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update
Working Group Initial Planning Meeting
January 20, 2016

SIGN-IN SHEET

Name	Title	Organization	Phone	Email
Bob Wood	SEC	Town of Slaughter Beach	443-845-6509	woodduck418@gmail.com
Adam Montella	Project Manager	OBL	813-355-7988	amontella@olsongroup.com
Melvin Cusick	Town Manager	Town of South Bethany	302-539-3653	townmanager@southbethany.org
Mark Seifert	Emergency Manager	Univ. of DE	8317394	seifert@udel.edu
Sgt. Adam Hitchens	Sergeant	Town of Laurel	875-2244	adam.hitchens@cj.state.de.us
James Fosky	Public Works Director	Town of Laurel	875-2277	laurelpwd@comcast.net
Joel Marshall	GIS Specialist	Sussex County	"	joel.marshall@sussexcountyde.gov
Mark Dean	"	"	855-1176	mdean@sussexcountyde.gov
Keith Banks	Chief of Police (EOP)	City of Rehoboth Beach	227-2577	Keith.banks@cj.state.de.us
Charles Anderson	Asst. CM	Seaford	629-9173	canderson@seafordde.com
Jamie Smith	TM Laurel	Laurel	875-2277	laureltm@comcast.net
Jeff Shockley	Floodplain Manager	Sussex County	302-855-7884	jshockley@sussexcountyde.gov
Charles McMullen	Admin. Official	Ocean View	302539 1208	admintov@oceanviewde.com
Michael S. Deal	Town Manager	Selbyville	302-436-8314	tmselbyville@mchsi.com
Charles Stevenson	Sussex EOC	Sussex EOC	302-855-7810	cstevenson@sussexcountyde.gov
Thomas Roth	Town Manager	Town of Henlopen Acres	302-227-6411	townmgr@henlopenacres.com
Greg Williams	NFIP Coordinator	DNREC	739-9921	gregory.williams@state.de.us
Janice Shute	Floodplain + Dam Safety Programs	DNREC	739 9921	janice.shute@state.de.us
Hana Beckerle	Project Support	OBL		hbeckerle@olsongroupltd.com
Joe Thomas	Director	Sussex EOC	302-855-7801	jthomas@sussexcountyde.gov

HMP Combined Steering Committee/Working Group Meeting Agenda

3/24/2016 300 PM

Sussex County Emergency Operations Center

1. HAZUS Update
2. Sussex County Hazards – Information Package
   a. List of Hazards
   b. Ranking of Hazards
   c. Methodology and Justification Behind Hazard Rankings
3. Presentation of Hazards
   a. PowerPoint Presentation
4. Working Group Discussion
   a. Hazard Rankings Presented
   b. Potential Changes to Rankings
   c. Finalized Hazard Ranking
5. Going Forward
   a. HIRA Development Expectations

Hazards Identified Within Plan to be Updated

Identified Hazards to be Updated		
Flood	Tornado	Tsunami
Drought	Hurricane Wind	Volcano
Winter Storm	Hail	Terrorism
Thunderstorm	Wildfire	HazMat Incident
Extreme Heat/Cold	Coastal E5osion	Pipeline Failure
Earthquake	Dam/Levee Failure	

Hazard Ranking Process

Calculated Priority Risk Index
CPRI

The Calculated Priority Risk Index (CPRI) combines user input and a mathematic equation to establish a ranking for each hazard.

There are four main criteria within the CPRI; *Probability, Magnitude/Severity, Warning Time*, and *Duration*. Each of these criteria are sub divided to further define and access the potential impact of the hazard.

These choices each represent a value from 0 to 4. Zero is the default value or the value utilized when an option is not assigned.

The CPRI is calculated based on the four selections with the following weightings for each criterion:

- Probability (P) = 45%
- Magnitude/Severity (M) = 30%
- Warning Time = 15%
- Duration (D) = 10%

Example:

.45(P) + .30(M) + .15(W) + .10(D) = CPRI #

The CPRI is subjective based on user selection of the criteria. The CPRI may be amended to reflect decisions by the Working Group.

CPRI Categories and Risk Levels

CPRI Category	Level ID	Degree of Risk Description	Index Value	Assigned Weighting Factor
Probability	Unlikely	• Rare with no documented history of occurrences or events. • Annual probability of less than 0.01.	1	45%
	Possibly	• Infrequent occurrences with at least 1 documented or anecdotal historic event. • Annual probability that is between 0.1 and 0.01.	2	
	Likely	• Frequent occurrences with at least 2 or more documented historic events. • Annual probability that is between 1 and 0.1	3	
	Highly Likely	• Common events with a well-documented history of occurrence. • Annual probability that is greater than 1.	4	
Magnitude /Severity	Negligible	• Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure). • Injuries / illnesses are treatable with first aid with no deaths. • Negligible quality of life lost. • Shut down of critical facilities for less than 24 hrs.	1	30%
	Limited	• Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). • Injuries / illnesses do not result in permanent disability with no deaths. • Moderate quality of life lost. • Shut down of critical facilities for more than 1 day and less than 1 week.	2	
	Critical	• Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). • Injuries / illnesses result in permanent disability and at least 1 death. • Shut down of critical facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	• Severe property damages (greater than 50% of critical and non-critical facilities and infrastructure). • Injuries / illnesses result in permanent disability and multiple deaths. • Shut down of critical facilities for more than 1 month.	4	
Warning Time	Less than 6 hrs.	Self-explanatory	4	15%
	6 to 12 hrs.	Self-explanatory	3	
	12 to 24 hrs.	Self-explanatory	2	
	More than 24 hrs.	Self-explanatory	1	
Duration	Less than 6 hrs.	Self-explanatory	1	10%
	Less than 24 hrs.	Self-explanatory	2	
	Less than 1 week	Self-explanatory	3	
	More than 1 week	Self-explanatory	4	

CPRI Ranking Index

CALCULATED PRIORITY RANKING INDEX SUMMARY						
Hazard	Probability	Magnitude and/or Severity	Warning Time	Duration	CPRI Score	Hazard Ranking
Flood	1.8	.60	.30	.30	3	1
Drought	.90	.60	.15	.40	2.05	4
Winter Storm	1.35	.30	.15	.20	2	6
Thunderstorm	1.8	.60	.30	.20	2.9	2
Extreme Heat/Cold	1.35	.30	.15	.30	2.1	5
Tornado	.45	.60	.60	.10	1.75	7
Hurricane Wind	1.8	.60	.30	.20	2.9	2
Hail	.90	.30	.45	.10	1.75	8
Tsunami	.45	.30	.15	.10	1	9
Earthquake	--	--	--	--	--	10
Wildfire	--	--	--	--	--	Unranked
Coastal Erosion	--	--	--	--	--	Unranked
Dam/Levee Failure	--	--	--	--	--	Unranked
Volcano	--	--	--	--	--	Unranked
Terrorism	--	--	--	--	--	Unranked
HazMat Incident	--	--	--	--	--	Unranked
Pipeline Failure	--	--	--	--	--	Unranked

CHANGE IN HAZARD RANKING

CHANGE IN HAZARD RANKING			
Hazard	2010 Ranking	2016 Ranking	Change Status
Flood	1	1	Unchanged
Drought	2	4	Down 2
Winter Storm	3	6	Down 3
Thunderstorm	4	2	Up 2
Extreme Heat/Cold	5	5	Unchanged
Tornado	7	7	Unchanged
Hurricane Wind	8	2	Up 6
Hail	9	8	Up 1
Tsunami	Unranked	9	Up 9
Earthquake	6	Unranked	Down 6
Wildfire	Unranked	Unranked	Unchanged
Coastal Erosion	Unranked	Unranked	Unchanged
Dam/Levee Failure	Unranked	Unranked	Unchanged
Volcano	Unranked	Unranked	Unchanged
Terrorism	Unranked	Unranked	Unchanged
HazMat Incident	Unranked	Unranked	Unchanged
Pipeline Failure	Unranked	Unranked	Unchanged

Hazard Ranking

Identified Hazards to be Updated	
Flood	1
Thunderstorm	2
Hurricane Wind	2
Drought	4
Extreme Heat/Cold	5
Winter Storm	6
Tornado	7
Hail	8
Tsunami	9
Earthquake	Unranked
Wildfire	Unranked
Coastal E5osion	Unranked
Dam/Levee Failure	Unranked
Volcano	Unranked
Terrorism	Unranked
HazMat Incident	Unranked
Pipeline Failure	Unranked

HMP Steering Committee & Working Group Combined Planning Meeting Minutes

3/24/2016

Date and Location. A Hazard Mitigation Plan (HMP) combined Steering Committee and Working Group Planning Meeting was held on March 24, 2016 at 3:00 PM at the Sussex County Emergency Operations Center.

Participants. The combined Steering Committee and Working Group meeting attendees included representatives from the following organizations:

- Department of Natural Resources and Environmental Control (DNREC)
- Town of Ocean View
- Town of Selbyville
- Sussex County Emergency Operations Center (EOC)
- The Mangeri Group L.L.C.
- The Olson Group, Ltd. (OGL)
- Town of Henlopen Acres
- Town of South Bethany

Purpose. The purpose of the meeting was to provide an update the HMP Steering Committee and Working Group on the status of the HMP Update project and discuss next steps. Discussion and agreements made between meeting attendees during the meeting are provided below.

Overview of Activities

Project Update: Mr. Anthony Mangeri, Sr., MPA, CPM, CEM discussed the project progress. Mr. Mangeri discussed the process of using HAZUS software, courtesy of the University of Delaware in cooperation with Sussex County EOC and Sussex County GIS. HAZUS is a software program that uses GIS and data provided to map hazards and risk facilities in a given jurisdiction.

Mr. Mangeri then presented a list of hazards, the priority ranking of those hazards, and the methodology and justification behind the hazard rankings. Meeting attendees discussed past events, current mitigation projects and expenditures, and other factors that may change the ranking of hazards.

Please see the meeting packet sent separately from these minutes to view the current hazard rankings.

Public Meetings. As per FEMA requirements for the HMP Update project, it is required that the public be notified of the project and updated on its progress. The Olson Group team presented the project to the Sussex County Planning and Zoning Commission at its public meeting on March 24, 2016 at 6 p.m.

Data and Information Request Process: The project team continues work with the Stakeholder Working Group to gather the information and data necessary to complete the plan update. Information gathered will include the sector for each identified critical facility (transportation, health, etc.), the repetitive loss inventory from county Floodplain Management, the participating National Flood Insurance Program (NFIP) jurisdictions, and current local hazard mitigation ordinances, projects and strategies.

Next Steps. The Olson Group team will analyze data provided by Steering Committee and Working Group members to revise the current priority rankings for hazards. The Olson Group team will also continue development of the Hazard Identification and Risk Analysis (HIRA) for Sussex County.

Project Timeline. The HMP Update project received a deadline extension from FEMA until October 2016 due to the county's emergency declaration in response to Winter Storm Jonas. It is anticipated that the project will be completed well before the extension deadline. The original project timeline was distributed to the Steering Committee and Stakeholder Working Group at the January 20 Initial Planning Meeting.

Future Planning Meetings. Additional meetings will be scheduled as the project progresses. The project team will attempt to schedule meetings during or in conjunction with existing meetings in an effort to and maximize stakeholder attendance and engagement. The next meeting will tentatively be scheduled in late April or early May 2016.

Outstanding Actions

The following actions remain:

- OGL to send out Minutes from this meeting.
- OGL and Mangeri Group to develop meeting agendas and prepare read-ahead materials for future planning meetings.
- OGL and Mangeri Group to schedule future planning meetings with the Steering Committee, Stakeholder Working Group and other stakeholders.
- Sussex County municipalities to provide additional data on past events and current expenditures to OGL and Mangeri Group for analysis.
- OGL and Mangeri Group to begin HIRA development.

Hazard Mitigation Plan Update Project Points of Contact (POCs)

Sussex County:

Joe Thomas
302-855-7801

The Olson Group, Ltd.

Adam Montella, Project Manager
813-657-5395

Anthony Mangeri, Sr. MPA, CPM, CEM Lead Planner
856-217-9172

Attendee List

The following individuals attended the Planning Meeting.

Name	Organization	Phone Number	E-Mail
Eric Norenberg	City of Milford	302-424-8394	enorenberg@milford.de.gov
Mike Powell	DNREC	302-739-9921	Michael.powell@state.de.us
Anthony Mangeri, Sr. MPA, CPM, CEM	Mangeri Group L.L.C.	856-217-9172	amangeri@mangerigroup.com
Charles McMullen	Ocean View	302-539-1208	admintov@oceanviewde.com
Charles Stevenson	Sussex County EOC	302-855-7800	cstevenson@sussexcountyde.gov
Hana Beckerle	The Olson Group	703-518-9982	hbeckerle@olsongroupltd.com
Thomas Roth	Town of Henlopen Acres	302-227-6411	townmgr@henlopenacres.com
Michael S. Deal	Town of Selbyville	302-436-8314	tmselbyville@mchsi.com
Scott Collins	Town of Selbyville	302-436-5085	Ward.collins@cj.state.de.us
Joseph Hinks	Town of South Bethany	302-539-3653	inspector@southbethany.org

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Sussex County
Planning & Zoning Commission

AGENDA

March 24, 2016

6:00 P.M.

Call to Order

Approval of Agenda

Approval of Minutes – March 10, 2016

Special Business

Hazard Mitigation Plan Presentation

Old Business

CZ 1759 Osprey Point D, LLC

Application of Osprey Point D, LLC to amend the Comprehensive Zoning Map of Sussex County from an AR-1 Agricultural Residential District to a MR-RPC Medium Density Residential District – Residential Planned Community for a certain parcel of land lying and being in Lewes and Rehoboth Hundred, Sussex County, containing 126.8795 acres, more or less, land lying west of Old Landing Road (Road 274) 1.2 mile south of Warrington Road (Road 275) (911 Address: 20836 Old Landing Road, Rehoboth Beach, DE) (Tax Map I.D. # 3-34-18.00-83.00).
Announcement of receipt of DelDOT comments and applicants response.

C/U #2043 Edward J. Kaye

An Ordinance to amend Condition No. 19 of Conditional Use No. 1431 (Ordinance No. 1530) to allow additional time to complete existing borrow pit operation located on a certain parcel of land lying and being in Seaford Hundred, Sussex County, containing 200.5 acres, more or less. The property is located at the northeast corner of Rd. 531 (Eskridge Rd.) and Rd. 533 (Sandfilippo Rd.). (911 Address: 22223 Eskridge Rd., Seaford). Tax Map I.D. 331-4.00-49.00

C/Z #1798 David and Veronica Hamm/Clarksville Auto

An Ordinance to amend the Comprehensive Zoning Map of Sussex County from an AR-1 (Agricultural Residential District) and a C-1 (General Commercial District) to a CR-1 (Commercial Residential District) for a certain parcel of land lying and being in Baltimore Hundred, Sussex County containing 3.99 acres, more or less. The property is located northeast of Atlantic Ave. (Rt. 26) approximately 300 ft. northeast of the

Clarksville intersection of Omar Rd. (Rt. 54). (911 Address: None Available) Tax Map I.D. 134-11.00-155.00, 153.00, and 83.01

Public Hearings

C/Z #1796 Lockwood Design and Construction Inc., – an Ordinance to amend the Comprehensive Zoning Map of Sussex County from an AR-1 (Agricultural Residential District) to a MR (Medium Density Residential District) for a certain parcel of land lying and being in Lewes and Rehoboth Hundred, Sussex County containing 35.45 acres, more or less. The property is located on the northeast side of Warrington Rd. (Rd. 275), 0.25 mile southeast of John J. Williams Hwy. (Rt. 24). (911 Address: None Available) Tax Map I.D. 334-12.00-127.02, 127.04, 127.05

C/U #2046 Lockwood Design and Construction Inc.,– an Ordinance to grant a Conditional Use of land in a MR (Medium Density Residential District) for multi-family dwelling structures located on a certain parcel of land lying and being in Lewes and Rehoboth Hundred, Sussex County, containing 35.45 acres, more or less. The property is located on the northeast side of Warrington Rd. (Rd. 275) 0.25 mile southeast of John J. Williams Hwy. (Rt. 24). (911 Address: None Available). Tax Map I.D. 334-12.00-127.02, 127.04, 127.05

Other Business

Harbor Point 2013-4
Final Subdivision Plan

Cape Henlopen State Park
Final Site Plan

Bay Forest Club Phases 4 & 5
Final Site Plan

Harbor Point 2013-4 – Amenities
Preliminary Site Plan

Coastal Station
Preliminary Site Plan

Lands of Reyna, Jr on Coon Den Rd.
Minor Subdivision with 50 ft. easement

Lands of Farmer John B. Calhoun Farm, LLC
Minor Subdivision with 50 ft. easement

Lands of George West off West Beach Rd.
Minor Subdivision off 50 ft. easement

Lands of Calvanesa off Dublin Hill Rd.
Minor Subdivision with 50 ft. easement

****

Planning and Zoning Commission meetings can be monitored on the internet at www.sussexcountyde.gov.

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In accordance with 29 Del. C. §10004(e)(2), this Agenda was posted on March 17, 2016, 2016, at 8:37 am., and at least seven (7) days in advance of the meeting.

This Agenda is subject to change to include the addition or deletion of items, including Executive Sessions, which arise at the time of the Meeting.

Agenda items listed may be considered out of sequence.

####

Sussex County Multi-Jurisdiction Hazard Mitigation Plan Update
County Council Briefing August 9, 2016

Hazard Mitigation is any action taken to reduce or eliminate long-term risk to people and property from natural hazards.

HMP Update Project: The purpose of this grant-funded project is to update the County's existing Hazard Migration Plan. The project involves stakeholders from the County, each municipality, DEMA and other Delaware agencies, Delaware State University, and the public.

Where we are with the Update:

- 4 of the 7 Plan Sections are completed in draft form and are in the process of final edits before submission to DEMA.
- We are in the process of updating the data found in Sections 4: Risk Assessment, Section 5: Capabilities and Resources and Section 6: Mitigation Strategy with each municipality.
- Currently we are working define and update significant hazards that may impact the County.
    - The Team is working to secure and analyze data related to Hazardous Materials Incidents in the County since the last update.
    - Adding language to discuss the potential risk from coastal zone erosion into the erosion section.
- With the assistance of the County GIS Office, the team is in the process of updating Section 4 Risk Assessment.
- On August 10th and 11th, we will be holding working sessions with all participating municipalities to review material from the previous plan, assess local capabilities to manage hazards and to review potential hazard mitigation projects as warranted to reduce community risk.
- We have taken steps to engage the community in the process. The project has a web presence on the Sussex County EOC website. Residents will be able to review the draft document and provide feedback for discussion within the working group.
- We have held public meetings to include presenting the intent of the update to the County Planning Board. The next public meeting is tentatively scheduled for September 1, 2016 during our Advisory Committee and Working Group meeting.
- The draft Plan will be submitted to DEMA in September and to FEMA for Review and Approval in October.
- We will come back before Council after FEMA Approval for adoption and seek municipal adoption at that time.

Meeting Summary

HAZUS and GIS Status
April 5, 2016, 10 AM Conference Call

Attendees:

Megan Nehrbas, Sussex County GIS Manager
Anthony S. Mangeri representing Olson Group
Pete Dennen representing Olson Group

Agenda

1. HAZUS Run review and update.
2. Data extraction from HAZUS
3. Mapping products general review
4. Hazard specific mapping at County and local level
5. General issues/concerns

The meeting was requested by the planning group to discuss the status of the HAZUS Run as well as the status of the previously provided list of GIS related products and deliverables. Of primary concern is the status of mapping in support of hazard profiles for Sussex County. During the last Working Group meeting, mapping and data needs were reviewed and discussed. This meeting was intended to support this effort.

HAZUS Review

- Megan Nehrbas informed the contract team that her office was performing the HAZUS Run, and were 3 days into the run.
- The University of Delaware is providing technical support and information as needed.
- The University will continue to provide technical assistance throughout the process.
- The HAZUS run should be complete shortly. The county GIS will evaluate the data returns and then inform all when the modeling is complete and available.

Questions/concerns/issues:

During the discussion covering the HAZUS Run, there were a few areas that continue to need discussion and clarification. The most significant areas that needing to be resolved are:

- Which agencies that can provide map production/update for hazard profiles that are currently in the SC Mitigation Plan
- Revision of tabular data and table builds from the HAZUS Run

Maps Review

- Discussed hazards mapping needs at the county and municipal level
- Floodplain mapping needs
- Critical Infrastructure data verification and mapping
- County and local jurisdiction mapping requirements
- HAZUS generated information/data layers to create mapping

Questions/concerns/issues:

The following items need continue dialogue to assure plan revision

Meeting Summary

HAZUS and GIS Status
April 5, 2016, 10 AM Conference Call

- A determination by the county as to who has mapping products creation/updating responsibilities for hazard profiles that are currently in the SC Mitigation Plan
- Revision of tabular data and table builds
- Production of tabular data sets responsibilities
- Development of a matrix to identify what mapping products are need for plan update

The group discussed the need for available information that can be turned into tabular form and maps. There has thus far been a lack of data/information coming from a majority of plan update participants.

- Anthony suggested that we work through Mr. Thomas to request participating communities to review data ASAP before moving on with the existing data.
- Ms. Nehrbas provided a screenshot of available information related to most recent storm data. Ms. Nehrbas felt the data is not very accurate in general. However, it is felt that it is best available data from the past few years.
- The data storage site has restrictions and not all of the provided data is viewable from outside the network. Built in security parameters.
- Ms. Nehrbas will work to provide the data in map and tabular form to identify the general location of the damaged property and value of reported damage.
- The discussion focused on the need to show Flood Hazard Boundaries and D-FIRM data maps by county and municipality to identify flood hazard boundaries

A determination needs to be made for:

- Identification of what agency can assist with map production and graphics that are beyond the scope of the County GIS Office.
- Other graphic need

Recommendations:

1. The Olson Group provide an updated matrix of the previously requested;
    a. Map figures
    b. Reports
    c. Data sets
2. When the HAZUS modeling is complete, review with Ms. Nehrbas the actual map request parameters.
3. Identify map examples as those found within the current Hazard Mitigation Plan.

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Sussex County Council

AGENDA

AUGUST 9, 2016

10:00 A.M.

**AMENDED ON AUGUST 5, 2016 AT 9:45 A.M.[1]

Call to Order

Approval of Agenda

Approval of Minutes

Reading of Correspondence

Public Comments

Todd Lawson, County Administrator

1. **Wastewater Agreement No. 984-6**
   Sussex County Project No. 81-04
   Coastal Club – Land Bay 4 – Phase 1
   Goslee Creek Planning Area

2. **Possible Introduction of a Proposed Ordinance Relating to Signs**

3. **Proposed Amendment to Ordinance No. 2414 entitled "AN ORDINANCE TO ESTABLISH A MORATORIUM UPON THE ACCEPTANCE OF SPECIAL USE EXCEPTION APPLICATIONS FOR OFF-PREMISES SIGNS"**

4. **Administrator's Report**

Vince Robertson, Assistant County Attorney

1. **Consideration of Annual Comprehensive Plan Report to the Governor's Advisory Council**

Jim Hickin, Director of Airport and Industrial Park Operations

1. **Hangar Lease Assignment – M&C Group, Inc.**

Joe Thomas, Director of Emergency Operations Center

1. **Sussex County Multi-Jurisdictional Hazard Mitigation Plan Update**

Hans Medlarz, County Engineer

1. **Administrative Office Building Chimney & Stair Repairs, Project 16-30**

   A. **Bid Rejection**

** 2. **Runway 4-22 24 Inch Storm Drain Lining**

   A. **Change Order No. 1**

John Ashman, Director of Utility Planning

1. **Proposed Resolution of the Boundary for the Chapel Branch Area of the Sussex County Unified Sanitary Sewer District**

Grant Requests

1. **Chamber of Commerce for Greater Milford for festival and fireworks expenses**
2. **CHEER for Car, Truck & Bike Show fundraiser**
3. **Milton Little League for trip expenses (9/10 All Star Team)**
4. **Nanticoke River Arts Council for general operating expenses**

Introduction of Proposed Zoning Ordinances

Council Members' Comments

Executive Session – Job Applicants' Qualifications, Personnel, Pending Litigation, Land Acquisition pursuant to 29 Del. C. §10004(b)

Possible Action on Executive Session Items

Adjourn

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Sussex County Council meetings can be monitored on the internet at www.sussexcountyde.gov.

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In accordance with 29 Del. C. §10004(e)(2), this Agenda was posted on August 2, 2016 at 4:50 p.m., and at least seven (7) days in advance of the meeting.

This Agenda was prepared by the County Administrator and is subject to change to include the addition or deletion of items, including Executive Sessions, which arise at the time of the Meeting.

Agenda items listed may be considered out of sequence.

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[1] **Per 29 Del. C. § 10004 (e) (5) and Attorney General Opinion No. 13-IB02, this agenda was amended to address a matter which arose after the initial posting of the agenda but before the start of the Council meeting.**

Sussex County Multi-Jurisdiction Hazard Mitigation Plan Update
County Council Briefing August 9, 2016

Hazard Mitigation is any action taken to reduce or eliminate long-term risk to people and property from natural hazards.

HMP Update Project: The purpose of this grant-funded project is to update the County's existing Hazard Migration Plan. The project involves stakeholders from the County, each municipality, DEMA and other Delaware agencies, Delaware State University, and the public.

Where we are with the Update:

- 4 of the 7 Plan Sections are completed in draft form and are in the process of final edits before submission to DEMA.
- We are in the process of updating the data found in Sections 4: Risk Assessment, Section 5: Capabilities and Resources and Section 6: Mitigation Strategy with each municipality.
- Currently we are working define and update significant hazards that may impact the County.
    - The Team is working to secure and analyze data related to Hazardous Materials Incidents in the County since the last update.
    - Adding language to discuss the potential risk from coastal zone erosion into the erosion section.
- With the assistance of the County GIS Office, the team is in the process of updating Section 4 Risk Assessment.
- On August 10th and 11th, we will be holding working sessions with all participating municipalities to review material from the previous plan, assess local capabilities to manage hazards and to review potential hazard mitigation projects as warranted to reduce community risk.
- We have taken steps to engage the community in the process. The project has a web presence on the Sussex County EOC website. Residents will be able to review the draft document and provide feedback for discussion within the working group.
- We have held public meetings to include presenting the intent of the update to the County Planning Board. The next public meeting is tentatively scheduled for September 1, 2016 during our Advisory Committee and Working Group meeting.
- The draft Plan will be submitted to DEMA in September and to FEMA for Review and Approval in October.
- We will come back before Council after FEMA Approval for adoption and seek municipal adoption at that time.

Sussex County Hazard Mitigation Plan
Update Workshop Schedule

August 10th

Scheduled Time	Interviewee
08:00am	Selbyville
09:00am	Frankford
10:00am	South Bethany
11:00am	
Noon	N/A
1:00pm	Henlopen
2:00pm	Fenwick Island
3:00pm	
4:00pm	

Scheduled Time	Interviewee
08:00am	
09:00am	
10:00am	
11:00am	
Noon	N/A
1:00pm	Ocean View
2:00pm	Laurel
3:00pm	
4:00pm	

August 11th

Scheduled Time	Interviewee
08:00am	Seaford
09:00am	Greenwood
10:00am	
11:00am	Millsboro
Noon	N/A
1:00pm	Bethany Beach
2:00pm	Milford
3:00pm	Bladen
4:00pm	Milton

~~Milford~~
Milton
Georgetown

Scheduled Time	Interviewee
08:00am	Millville
09:00am	Delmar
10:00am	Rehoboth
11:00am	Sussex County
Noon	N/A
1:00pm	Lewes
2:00pm	
3:00pm	
4:00pm	Georgetown

Bethel
Dagsboro
Dewey Beach
~~Georgetown~~

Slaughter beach - 9/2/16

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Sussex County

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Sussex County	X	X	X	X		X		X	X	X	X	X	X	X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Sussex County	8

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Sussex County	10/06/76

B-4

Self Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Sussex County	M	~~L~~M	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Sussex County Unincorporated Areas							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Work with DelDOT to improve all emergency access routes throughout the County.	Yes	High	4-5 years	In Progress		No
2	Improve the County's Community Rating System rating. Review and update community plans and ordinances and incorporate updated information into the CRS update.	Yes	High	24 months	In Progress		
3	Encourage residents to elevate manufactured housing located on the coast to above the base flood elevation (BFE).	Yes	High	Ongoing	In Progress		Warp into building code assist.
4	Work with homeowners to identify ways to elevate flood-prone structures.	Yes	High	Ongoing	In Progress		no
5	Improve educational awareness through better notifications, training, and properly marked flood evacuation routes.	Yes	High	9 months	In Progress		
6	Standardize Response Levels Plan and rewrite Emergency Operations Plan.	Yes	High	24 months	In Progress		No
7	Construct four-lane East/West emergency evacuation route to Maryland toll road (Routes 918 and 404).	Yes	Moderate	12 months	Not started		No
8	Distribute disaster preparedness and hazard mitigation-related information using brochures and website link.	Yes	Moderate	Ongoing	In Progress	1200	
9	Work with DelDOT to install storm drain of culvert on 1100 Block of South Bayshore Drive in Broadkill Beach.	~~Yes~~	~~High~~	~~24 months~~	~~Not started~~		
10	Work with DNREC and DelDOT to endorse Federally funded restoration projects to restore portions of the Sussex County coastline that are experiencing significant coastal erosion, both from rising sea levels and coastal storms.	No	Moderate	Ongoing	In Progress		Re-write
11	Work with DNREC to explore ways to finance beach restoration projects in private communities that are experiencing significant coastal erosion, both from rising sea levels and coastal storms.	No	Moderate	24 months	Not started		No
12	Develop a close working relationship between the county EOC and public utility companies. Identify a staff person from the utility companies to serve as a liaison to the County EOC for the inclusion of utility issues with emergency planning.	No	High	9 months	Not started		No
13	Work closely with unincorporated places, major	No	High	Ongoing	Not started		no

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	subdivisions, and beach communities like Broadkill and Prime Hook, and manufactured home parks to more accurately allocate resources and plan for hazard mitigation, evacuation, etc. and make them more inclusive in the planning process.						
14	Conduct a study to identify stormwater management systems that need to be retrofitted and channels that need to be improved in order to reduce flooding throughout the County.	No	Moderate	24 months	Not started		Yes
15	Work with DelDOT to identify possible elevation alternatives for the rebuilding of SR 38 (Prime Hook Road).	No	Moderate	24 months	~~Not started~~in progress	1.45 million	Yes

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
HMGP Project Funding				
Sussex County	Flood Mitigation Plan	Developed Flood Mitigation Plans for New Castle and Sussex Counties, and Bethany Beach, Dewey Beach, Lewes, Wilmington and Delaware City.	$85,396	Nov. 99
Sussex County	Fire Weather Monitoring Stations	Install fire-weather monitoring stations at Redden State Forest and Blackbird State Forest to allow Forest Service to monitor and predict forest fire potential	$22,495	Dec-98
Sussex County	Sussex County Home Elevation	Elevation of 11 flood-prone structures onto properly elevated engineered foundation.	$382,252	Dec 02
???	Wastewater Pump Mitigation Project	????	$10,706	Dec 07
FMA Project Funding				
Sussex County	Sussex County Home Elevation Project	Elevate three flood-prone houses to pile foundation in estuarine V Zone near Oak Orchard.	$205,000	2003
~~???~~	~~Elevation/ Relocation of Residential Structures~~	~~Approximately fifteen residential structures were elevated or relocated.~~	~~$750,000~~	~~???~~
Current Pending Mitigation Actions				
	3 Rep Loss Property elevations		300,000	In progress

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SECTION E: NFIP Participation and Qualifications Review (County)

NFIP Questions Matrix Verification

1. **Floodplain Identification and Mapping**				
Requirement	SHMO Recommended Action	Yes/No	County Action	Same / Changed
a. Does the County maintain a copy effective FIRM (flood insurance rate map) maps and FIS (flood insurance study) that is accessible to the public?	Place these documents in the local libraries.	Yes	Maintained on file by the Sussex County Department of Planning and Zoning.	
b. Has the County adopted the most current DFIRM or FIRM and FIS?	State date of adoption, if done.	Yes	~~Jan 6, 2005~~Dec 2, 2013	
c. Does the County support request for map updates?	If yes, state how.	No	Map changes, revisions, and amendments are reviewed by the County CFM (Jeff Shockley), and submitted to FEMA for further study and determination.	
d. Does the County share with FEMA any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	Sussex County has not conducted any studies that have included new data for map revisions. Suggestions and ideas for certain areas have been offered.	
e. Does the County provide assistance with local floodplain determinations?	If yes, specify how.	Yes	Sussex County Planning and Zoning Dept. assists property owners identify their location relative to the FIRMs.	
f. Does the County maintain a record of approved Letters of Map Change?	If yes, specify the office that does it.	Yes	The Sussex County Department of Planning and Zoning maintain these files on record.	

2. **Floodplain Management**				
Requirement	SHMO Recommended Action	Yes/No	County Action	Same / Changed
a. Has the municipality adopted a compliant floodplain management ordinance that at a minimum regulates the following:	If yes answer, (1) through (4) below.	Yes	Yes	
(**1**)Does the County issue permits for all proposed development in the SFHA?	If yes, specify the office.	Yes	Permits for proposed development and subdivision in the SFHA are issued by the Department of Planning and Zoning Commission and Sussex County Council.	
(**2**)Does the County obtain, review and utilize any Base Flood Elevation and floodway data, and require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office that does it.	Yes	This is required by the Sussex County Department of Planning and Zoning for proposed subdivision application.	
(**3**)Does the County identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the Base Flood Elevation, including anchoring, using flood resistant materials, designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office that does it.	Yes	Inspection and enforcement done by the Sussex County Department of Planning and Zoning.	
(**4**) Does the County document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures.	If yes, specify the office that does it.	Yes	Files on record and maintained by the Sussex County Department of Planning and Zoning.	
b. If a compliant floodplain ordinance was adopted, does the County enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Sussex County Planning and Zoning coordinates with DNREC and FEMA for community assessments; identifies properties in violation; and works with property owners to achieve compliance	

3. **Flood Insurance**				
Requirement	SHMO Recommended Action	Yes/No	County Action	Same / Changed
a. Does the County educate community members about the availability and value of flood insurance?	If yes, specify how. See Note 1.	No	Sussex County focuses primarily on proposed development and construction requirements within the floodplain. The flood insurance issues are directed to DNREC.	
b. Does the County inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	The public is notified when the maps are updated and prior to Sussex County adoption of the maps.	
c. Does the County provide general assistance to community members relating to insurance issues?		Yes	Sussex County offers preliminary assistance relating to flood insurance issues, but directs on to DNREC for finalization.	

1) Intent to participate form:
2) POC: Joe
3) Floodplain Manager: Jeff Shockley, CFM Environmental Manager
4) Main Hazards: Flood, Wind,
5) Jurisdiction Population:

5 Rep Loss properties
5 Sev Rep Loss

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Bethany Beach

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
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Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

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Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

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Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Bethany Beach	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
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REG-PL – Regional Planning
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ZO – Zoning Ordinance
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FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Bethany Beach	2010

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Bethany Beach	*Declined Participation*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Bethany Beach	4/06/73

B-4

CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Bethany Beach	5/1/09	8

B-5

Self Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Bethany Beach	M	M	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Improve existing drainage system throughout the Town, particularly east of Route 1 and also include a plan maintenance schedule.	Yes	High	Long term	In Progress	3.5 Million	HMGP, FMA, PDM, PS
Consider purchasing an inflatable dam for Loop and Assawoman Canal to protect against incoming tide waters.	Yes	Moderate	Short term	Delayed due to funding.		HMGP, FMA, PDM, PS
Continue to educate residents and improve public awareness on being better prepared to face hazards.	Yes	High	Short term	In Progress	1000	HMGP, FMA, PDM, PS, CDBG
Create 2 new outfalls leading from large ditch that runs from Route 26 behind Lake Bethany to the marsh and install flap gates.	No	High	Short term	Pending funding source	??	HMGP, FMA, PDM, PS
Conduct Phase 2 of Bethany West drainage improvements. Replace and upgrade existing storm-water system between Collins Street and Tudor Court along Halfmoon Drive including Tudor Court, Sandstone Court, and Pebble Court	No	High	Short term	Pending funding source		HMGP, FMA, PDM, PS
Conduct Phase 3 of Bethany West drainage improvements. Replace and upgrade existing storm-water facilities at West Side Development, enlarge outfall, replace driveway culverts, replace old pipe systems, re-grade ditches.	No	High	Short term	Pending funding source		HMGP, FMA, PDM, PS
Mitigation Actions Started / Completed since 2010 Plan Update						
Potential / New Mitigation Actions For Consideration						
Storm water runoff on Pennsylvania Ave from Garfield to 5th	No	High	Short term	Pending funding source	250,00	HMGP
Storm water management at 8th Street and Evans Ave (low lying area	No	High	Short term	Pending funding source	250,00	HMGP

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
HMGP Project Funding				
Bethany Beach	Long Neck, Bethany Sewer Flood-proofing	Elevate manhole openings, flood-proof hatch-cover doors, elevate electrical components in water proof cabinets in sanitary sewer system.	$26,997	Dec-96
Bethany Beach	Bethany Beach Handicapped Ramp Retrofit	Bury overhead electric power lines to Primehook, DE by Delaware Electric Cooperative to protect the line from wind and ice damage.	$71,204	Nov 98
FMA Project Funding				
Bethany Beach	Bethany Beach Tideflex Valve Project	Install backflow valves to prevent tidal flooding from backing up through storm drains and flooding streets and businesses in downtown Bethany Beach.	$90,000	2002

POC: Darin Cathell, 302-539-1000
Floodplain Manager: Susan Frederick
Main Hazards: Flooding, Storm Runoff, Dunes

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Bethel

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Bethel									X			X	X	X		X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
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SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Bethel	Contacted

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Bethel	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Bethel	1/16/81

B-5

Self Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Bethel	L	L	L

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Bethel							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Educate the public regarding preparedness and protection measures.	Yes	High	Ongoing	Delayed		
2	Review County Office of Emergency Services plans regarding protective measures and evacuation procedures for hazardous materials incidents and share this information with citizens. Information should include ways to elevate and/or harden oil and gas storage tanks to avoid spills and contamination of surrounding areas.	Yes	High	12 months	Delayed		
3	Educate the public on the necessity of periodic well testing, especially during periods of drought.	Yes	High	12 months	Delayed		
4	Educate the public regarding special needs populations in the event of winter storms.	Yes	High	12 months	Delayed		
5	Identify shelters and notify the public about their location.	Yes	High	12 months	Delayed		
6	Educate the public concerning sheltering-in-place should a terrorist attack occur.	Yes	High	24 months	Delayed		
7	Identify historic structures and develop mitigation strategies to protect any at-risk properties.	Yes	Moderate	24 months	Delayed		
New Mitigation Actions							
8							
9							
10							
11							
12							
13							
14							
15							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				

1) Intent to participate form:
2) POC:
3) Floodplain Manager:
4) Main Hazards:
5) Jurisdiction Population:

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Blades

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

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SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Blades			X						X					X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
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FMP – Floodplain Management Plan / Flood Mitigation Plan
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BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Blades	**Certified (2002) 2008**

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Blades	***Declined Participation***

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Blades	**1/16/81**

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Blades	~~L~~M	~~L~~M	~~L~~M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Blades							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Fix stormwater drainage problems with existing underground pipes and outfall areas to help prevent future flooding.	Yes	High	When funds become available	Delayed		
2	Install new storm drains in strategic areas to allow removal of standing water during storms.	Yes	High	When funds become available	~~Delayed~~ongoing	2 million	Yes
New Mitigation Actions							
3							
4							
5							
6							
7							
8							
9							
10							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				
Blades	Stormwater management upgrade	Enlarged and improved culverts West 3rd Street (150 ft)	3500	complete
Blades	Stormwater management upgrade	East 2nd ~~s~~St - East 3rd street - culvert expansion and upgrade (150 ft)	3000	complete
Blades	Stormwater management	Enforcement of building and zoning codes in support of new construction (Fire House)		ongoing
Blades	Stormwater management upgrade	Market Street stormwater system upgrade	500,000	Under development
	Blades stormwater Management Project	5Phase study completed	10,000	Complete
	Blades stormwater Management Project	Phase I - upgrade to culvert along Hollaway Street and West 2nd Street, West High Street	250,000	Complete
	Blades stormwater Management Project	Phases 2 thru 5 are pending funding		pending

1) Intent to participate form: will do
2) POC: Vikki Prettyman - Town Administrator
3) Floodplain Manager: Vikki Prettyman
4) Main Hazards: Flood,
5) Jurisdiction Population:

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Bridgeville

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Bridgeville	X		X	X		X	X	X	X	X	X	X	X	X		X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Bridgeville	**2016**

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Bridgeville	**8***

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Bridgeville	**1/07/77**

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Bridgeville	**M**	**L**	**M**

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Purchase mobile surveillance cameras for town use - protection for possible terrorist threats, drug activity, burglaries, etc.	No	High	Short term	Grant pending	45,000	HSGP
Currently the police department is housed separate from the other administrative offices in an old building. Relocate the police department and Town offices to one building to increase efficiency.	No	High	Short term	Architectural plans in place, awaiting funding		CDBG
Mitigation Actions Started / Completed since 2010 Plan Update						
Potential / New Mitigation Actions For Consideration						
Security fence at well-house and lift station	No	High	Short term	Pending funding	50,000	HSGP
Storm water management plan development with replacement timeline	No	High	Short term	Pending funding	150,000	HMGP, FMA, PDM

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						

POC: Jesse Savage
Floodplain Manager: Jerry Butler, 302-337-7135
Main Hazards: Wind, Rain, Hurricane

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Dagsboro

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Dagsboro			X						X		X	X		X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Dagsboro	Certified (2003)

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Dagsboro	*Declined Participation*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Dagsboro	6/01/81

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Dagsboro	L	L	L

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Dagsboro							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	In coordination with Sussex County, fully participate in public outreach programs designed to promote hazard education and awareness for residents and businesses.	Yes	Moderate	Ongoing	Delayed		
New Mitigation Actions							
2							
3							
4							
5							
6							
7							
8							
9							
10							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				

1) Intent to participate form:
2) POC:
3) Floodplain Manager:
4) Main Hazards:
5) Jurisdiction Population:

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Delmar

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Delmar			X		X	X	X		X	X	X			X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Delmar	Complete (2005)

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Delmar	*Not Evaluated*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Delmar	*Not in NFIP*

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Delmar	L	L	L

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Mitigation Actions Started / Completed since 2010 Plan Update						
Potential / New Mitigation Actions For Consideration						
Develop a disaster recovery plan	No	Medium	Short term	Pending funding source	2,000	CDBG, HSGP
Community outreach program development to include web based preparedness.		Medium	Short term	Pending funding source	2,500	HMGP, FMA, PDM, CDBG
GPS tracking for snow removal vehicles		Low	Short term	Pending funding source	3.500	CDBG, HSGP, PS

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Conduct a vulnerability assessment of wastewater and stormwater management systems throughout the Town.	Yes	High	3-5 years	Completed	10,000	N/A
Develop an Emergency Operations Plan to include identifying additional local hazards.	Yes	High	12-24 months	Completed	2,000	N/A

POC: Sara Bynum-King, 302-846-2664
Floodplain Manager: William Hardin, 302-846-2664
Main Hazards: Snow, Wind

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Dewey Beach

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Dewey Beach			X	X					X			X		X	X	X	X	X	X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Dewey Beach	In Progress

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Dewey Beach	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Dewey Beach	6/18/82

B-4

CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Dewey Beach	10/1/94	8

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Dewey Beach	H	H	L

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Dewey Beach							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Develop a Disaster Warning System to notify the community of an impending disaster.	No	High	12-24 months	Not started		
2	Consider reconstructing the Rehoboth Bay shoreline which has been eroded due to heavy flooding from seawater and drainage from Nor' Easter storms.	No	Moderate	24-36 months	Not started		
3	Prepare and stock handouts of what to do in case of a disaster.	No	High	12 months	Not started		
4	Prepare an update to the Town's Emergency Operation Plan.	No	High	12-24 months	Not started		
New Mitigation Actions							
5							
6							
7							
8							
9							
10							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
HMGP Project Funding				
Dewey Beach	Dewey Beach Protective Dune	Project managed by DNREC to develop protective dune for Dewey Beach	$64,834	Sep-94
Current Pending Mitigation Actions				

1) Intent to participate form:
2) POC:
3) Floodplain Manager:
4) Main Hazards:
5) Jurisdiction Population:

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Ellendale

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Ellendale			X						X					X	X				X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Ellendale	Update in Progress (2009)

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Ellendale	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Ellendale	*Not in NFIP*

B-5

Self Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Ellendale	L	L	L

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Ellendale							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Develop an Emergency Transportation Plan for the Town that addresses Route 16 and the railroad crossing through the Town. Identify what other evacuation routes are available if Route 16 is closed due to a railroad problem.	Yes	High	12 months	Delayed due to funding.		
2	Evaluate the Town's storm drainage systems to identify problem areas.	No	High	12 months	Not started		
3	Continue to educate residents and improve public awareness on being better prepared to face hazards.	No	High	Ongoing	Not started		
New Mitigation Actions							
4							
5							
6							
7							
8							
9							
10							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				

1) Intent to participate form:
2) POC:
3) Floodplain Manager:
4) Main Hazards:
5) Jurisdiction Population:

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Fenwick Island

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Fenwick Island	X		X	X	X	X			X		X	X		X	X	X	X	X	X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Fenwick Island	~~Contacted~~2006 completed, 2011 updated, 2016 update underway

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Fenwick Island	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Fenwick Island	3/23/73

B-4

CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Fenwick Island	10/1/94	8

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Fenwick Island	~~L~~M	~~L~~M	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Fenwick Island							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Continue retrofitting drainage system and back water valves.	Yes	High	24 months	~~Unknown~~phase 1 complete, phase 2 continuing.	45,000	Yes
2	Educate property owners of water runoff-to bulkhead should be the responsibility of the homeowner.	Yes	Moderate	6 months	~~Unknown~~continuing	administrative	Yes
3	Adopt a stormwater management ordinance that regulates private property water runoff.	Yes	Moderate	9 months	~~Unknown~~Completed	2,500	Yes
4	Re-grade street ends at intersections along Bunting Avenue to direct the flow of water towards Coastal Highway.	No	Moderate	36 months	~~Not started~~Completed	55,000	Yes
New Mitigation Actions							
5	West Dagsboro Street upgrade and improvement of stormwater management culverts - 1000 ft				complete	130,000	
6	North Schultz Road upgrade and improvement of stormwater management culverts - 40 ft				complete	50,00	
7	Bay Street Street upgrade and improvement of stormwater management culverts - 500 ft				complete	65,000	
8	1 NFIP House Elevations		High		ongoing	62,000	
9							
10	See sheet from client						

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SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
HMGP Project Funding				
Fenwick Island	Fenwick Island Home Elevation	Elevation of two flood-prone structures onto properly elevated engineered foundations.	$41,690	June 2000
Fenwick Island	Fenwick Island Home Elevation Phase II	Elevation of seven flood-prone structures onto properly elevated engineered foundations. Also funded under Disaster 1205	$120,798	April 2002
Fenwick Island	Fenwick Island Home Elevation Re-scope	Elevation of four flood-prone structures onto properly elevated engineered foundation.	$84,432	June 2002
FMA Project Funding				
Fenwick Island	Fenwick Island Elevation Project	Elevate two flood-prone houses.	$100,000	2003
Current Pending Mitigation Actions				

1) Intent to participate form: Yes
2) POC: Patricia J Schuchman
3) Floodplain Manager: Patricia J Schuchman
4) Main Hazards: Flood, Wind, Snowstorm
5) Jurisdiction Population: 350 permanent, 5000 seasonal

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Frankford

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Frankford			X	X					X		X		X	X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Frankford	Complete (2009)

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Frankford	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Frankford	9/16/81

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Frankford	M	L	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Identify private and county owned ditches, determine drainage patterns and what should be done to reduce flood related impacts.	Yes	High	Short term	Delayed	50,000	HMGP, FMA, PDM
Conduct stormwater drainage assessment for the Town.	Yes	High	Short term	Delayed	40,000	HMGP, FMA, PDM
Create and distribute material targeted to Frankford residents to include contact numbers and "What to do in the event of information.	Yes	High	As funds become available	Not started	1,200	HMGP, FMA, PDM, CDBG
Update the county's web page to address emergency contact information for individuals and departments specific to the Town of Frankford.	Yes	Moderate	As funds become available	Not started	Administrative costs	N/A
Mitigation Actions Started / Completed since 2010 Plan Update						
Potential / New Mitigation Actions For Consideration						

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						

POC: Joanne Bacon, 302-732-6990
Floodplain Manager: Cheryn Lynch, 302-732-9424
Main Hazards: Flooding, Wind, Snow

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Georgetown

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Georgetown			X	X					X		X	X		X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Georgetown	Certified (2001) 2010

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Georgetown	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Georgetown	5/05/03

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Georgetown	L	M	L

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Georgetown							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Develop an Emergency transportation plan that addresses railroad activity on both sides of the tracks.	Yes	High	12 months	Unknown		No
2	Develop a Continuity of Government Plan.	Yes	High	12 months	Unknown		No
3	Establish critical facility emergency back-up power (police and fire stations).	Yes	High	12 months	Unknown		No
4	Install or provide portable back-up pumps for wastewater treatment facility (bypass pump).	Yes	High	24 months	Unknown		No
5	Develop a brochure for the public dealing with emergency situations.	Yes	Moderate	9 months	Unknown		No
6	Develop emergency generator back-up capability for production and distribution of potable water.	Yes	Moderate	12 months	Unknown		No
7	Develop corrective actions for Route 9, Route 113 and Route 18/404 that tend to bottleneck during the evacuation of residents, college students and transients.	Yes	Low	12 months	Unknown		No
	Tree cutback/trimming to clear power lines to protect against wind related tree impacts to said power lines		High		complete		
New Mitigation Actions							
8							
9							
10							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				
	Ed oiutreach	Hurricane Info outreach ed program (multi-lingual)	2500	pending
	Hazard related warning system		???	pending

1) Intent to participate form: Yes
2) POC: Gene Dvornick Town Manager
3) Floodplain Manager: Jeff Ward Construction Coordinator
4) Main Hazards: Wind, Snowstorm
5) Jurisdiction Population: 6422 2010 Census

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Greenwood

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Greenwood			X	X					X					X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Greenwood	~~In Progress~~Completed in 2013

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Greenwood	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Greenwood	2/24/78

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Greenwood	~~L~~M	~~L~~M	~~L~~M
	Change of personnel and experience	Change of personnel and experience	Change of personnel and experience

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Greenwood							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Dredge Cart Branch ditch.	Yes	High	12 months	~~Unknown~~Complete 2013	$750,000	
New Mitigation Actions							
2	Market Street (Addix Ave) stormwater management upgrade, piping diameter upgrades(increase) to facilitate run off flow.		Medium	5 years	Not initiated	$500,00	
3							
4	Market & Sussex		Medium	5 years	Not initiated	$500,00	
5							
6							
7							
8							
9							
10							

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SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				
	Stormwater Runoff upgrade	Market Street (Addix Ave) stormwater management upgrade, piping diameter upgrades(increase) to facilitate run off flow.	500K	
		Market & Sussex	500K	

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1) Intent to participate form: John F McDonnell
2) POC: John F McDonnell
3) Floodplain Manager: John F McDonnell
4) Main Hazards: Flood, Wind, Snowstorms
5) Jurisdiction Population: 973 2010 census

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Henlopen Acres

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Henlopen Acres		X	X	X	X	X	X		X		X	X		X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Henlopen Acres	2016

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Henlopen Acres	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Henlopen Acres	8/15/78

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Henlopen Acres	M	M	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Maintain beach dune system.	Yes	Moderate	Ongoing	Ongoing		HMGP, FMA, PDM
Mitigation Actions Started / Completed since 2010 Plan Update						
Potential / New Mitigation Actions For Consideration						
Risk and vulnerability assessment of town hall	No	Moderate	Ongoing	Pending funding source	3,000	HMGP, FMA, PDM, CDBG
Back-up generator for town hall	No	Moderate	Short term	Pending funding source	145,000	HMGP, HSGP
Instillation of backflow valves on storm water management system	No	High	Short term	Pending funding source	15,000	HMGP, FMA, PDM, CDBG

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Develop a marina plan for the Town.	Yes	High	Ongoing	Completed	1,000	N/A
Develop an Emergency Management Plan for the Town.	Yes	Moderate	Ongoing	Completed	3,000	N/A

POC: Thomas Roth
Floodplain Manager: Richard Kollar, 302-227-6411
Main Hazards: Flooding, Wind

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Laurel

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Laurel			X		X				X		X			X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Laurel	2011

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Laurel	6

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Laurel	1/18/81

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Laurel	L	L	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Create a service road to the wastewater manholes on West Sixth Street.	Yes	High	Short term	Delayed due to funding.	40,000	
Replace bulkhead on the north side of Broad Creek, between Popular Street and the railroad bridge.	Yes	High	Short term	Delayed due to funding.	500,000	HMGP, FMA, PDM
Relocate the Town Hall, Public Works and Police Departments.	Yes	Low	Short term	Delayed due to funding.	1 million	HMGP, FMA, PDM
Mitigation Actions Started / Completed since 2010 Plan Update						
Potential / New Mitigation Actions For Consideration						
Segregate storm water system from sanitary system.	Yes	High	Short term	Pending funding source	1 million	HMGP, FMA, PDM. CDBG

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Consider closing the well at 10th & Deshields street and replace waterlines on 10th Street.	Yes	Moderate	Ongoing	Complete pending closeout	N/A	N/A

POC: Ken West, 302-875-2277
Floodplain Manager: Ken West
Main Hazards: Heavy Rain, Flooding

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

City of Lewes

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
City of Lewes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Lewes	In Progress 2005, updated 2010 2015 update in process

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Lewes	9

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Lewes	3/15/77

B-4

CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Lewes	10/1/92	9

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Lewes	M	~~L~~M	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

City of Lewes							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Review and update evacuation and notification procedures for the City.	Yes	High	12-24 months	Unknown		No
2	Improve stormwater management throughout the City.	Yes	Moderate	3-5 years	~~Delayed due to funding.~~ in progress		
3	Increase participation in the National Flood Insurance Program.	Yes	Moderate	1-3 years	Unknown		No
4	Minimize damages from high wind events.	Yes	Moderate	Ongoing	~~Unknown~~ongoing		Re-write to reflect building code adoption.
5	Implement Continue application and improvement of hazard mitigation education ~~a~~ community outreach program.	Yes	Moderate	Ongoing	~~Unknown~~ongoing	5000	Yes
6	Reduce vulnerability to wildfires.	Yes	Moderate	1-3 years	~~Unknown~~ongoing	n/a	
7	Continue data acquisition and enhancements to the GIS.	Yes	Moderate	1-5 years	~~Unknown~~complete		
8	Enlist the services of City service organizations in implementing a disaster preparedness outreach program.	No	High	Ongoing	Not started		Connect to 5
9	Facilitate the coordination of response procedures related to events.	No	High	12 months	Not started		No
10	Develop response plans (including evacuation and sheltering procedures) related to special needs populations and pets. Also include a "Refuge of Last Resort" Plan and a plan to transport City residents to county designated shelters.	No	High	12-24 months	Not started		No
New Mitigation Actions							
11							
12							
13							
14							
15							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
HMGP Project Funding				
Lewes	City of Lewes Home Elevation	Elevation of eight flood-prone structures onto properly elevated engineered foundations.	$326,848	June 2000
Lewes	City of Lewes Home Elevation Re-scope	Elevation of five flood-prone structures onto properly elevated engineered foundations.	$12,292	Sept 2002
Lewes	City of Lewes Fire Department Wind Retrofit	Installation of hurricane strapping to Station #82, which also serves as the City's Emergency Operations Center.	$12,292	Sept 2001
Current Pending Mitigation Actions				
	Study	Study to determine evacuation route elevations to identify flood prone sections/areas.	10,000	Sept 2015
	Ordinance adoption	Adoption of International Building Codes		2014

1) Intent to participate form: Will do
2) POC: see card
3) Floodplain Manager: Henry Baynum Jr Building Official
4) Main Hazards: Flood, Wind, Snow Storm
5) Jurisdiction Population: 2780 Census 2010

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

City of Milford

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
	X		X			X			X		X	X		X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Milford	2009

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
	7

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
	06/01/1977

B-4

CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
		Not participating

B-5

Self Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
	M	H	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Bethany Beach							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
	SEE KENY COUNTY PLAN						
New Mitigation Actions							
7							
8							
9							
10							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
HMGP Project Funding				
FMA Project Funding				
Current Pending Mitigation Actions				
Milford	Water Treatment Facility Relocation	Removal and relocation of water treatment plant out of the floodplain		In progress
	Theater Elevation	Elevate existing theater structure to meet current ordinances in preparation for expansion.	1.5 million	Project under development
	Relocation of police station	Relocation of police station out of floodplain	9 million	Project under development

1) Intent to participate form: pending
2) POC: Eric Norenberg
3) Floodplain Manager: Don Williams Chief Building
4) Main Hazards: Flood, Wind,
5) Jurisdiction Population: 10179 2014

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Millsboro

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Millsboro			X						X					X	X	X	X		X

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EOP – Emergency Operations Plan
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REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Millsboro	2012

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Millsboro	7

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Millsboro	9/01/78

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Millsboro	M	M	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Improve storm-water drainage within the Town. (Wilson Highway and Progress)	Yes	High	Short term	In progress	500,000	HMGP, FMA, PDM
Retrofit two pump stations.	Yes	Moderate	Short term	Ongoing	500,000	HMGP, FMA, PDM
Mitigation Actions Started / Completed since 2010 Plan Update						
Potential / New Mitigation Actions For Consideration						
Mitchel Street study to evaluate potential bulkhead instillation.	No	High	Ongoing	Pending funding source	100,000	HMGP, FMA, PDM
Develop storm-water management plan	No	High	Ongoing	Pending funding source	150,000	HMGP, FMA, PDM
Cuplin Park (Indian Rive) bulkhead upgrade	No	High	Ongoing	Pending study		HMGP, FMA, PDM

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Conduct a study to identify roads that need to be elevated and culverts that need to be widened.	Yes	Moderate	Short term	Completed	100,000	HMGP, FMA, PDM

POC: Sheldon P. Hudson, 302-984-8171
Floodplain Manager: George K. Niblett
Main Hazards: Tidal Flooding

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Millville

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Millville			X	X					X			X	X	X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
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REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Millville	2011

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Millville	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Millville	9/25/81

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Millville	L	L	L

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Mitigation Actions Started / Completed since 2010 Plan Update						
Potential / New Mitigation Actions For Consideration						
Develop mitigation (wind loads) outreach program specifically targeting Millville by the Sea development	No	Moderate	Short term	Pending funding source	2,000	HMGP, FMA, PDM, CDBG
Improve and upgrade water flow and discharge capacities of tax ditches town wide	No	Moderate	Short term	Pending funding source	150,000	HMGP, FMA, PDM

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Retrofit the Millville Town Hall to include back up power supply. Install a propane powered generator.	Yes	High	Short term	Completed	360,000	N/A
Conduct an assessment of all culverts to include proper size and design based on current infrastructure and future development.	Yes	Moderate	Short term	Completed by DelDot	N/A	N/A

POC: Eric Evans, 302-539-0449
Floodplain Manager: Eric Evans
Main Hazards: Wind, Hurricane

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Milton

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Milton			X	X									X	X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
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CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Milton	2010

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Milton	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Milton	8/01/78

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Milton	L	M	L

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Promote emergency preparedness information.	Yes	Moderate	Short term	Ongoing	No cost	HMGP, FMA, PDM, CDBG
Join the Community Rating System.	Yes	Moderate	Short term	Delayed due to staffing	Administrative costs	N/A
Conduct a study to identify measures to mitigate flooding in down town area	No	High	Short term	Pending funding source	150,000	HMGP, FMA, PDM, CDBG
Potential / New Mitigation Actions For Consideration						
Modify floodplain management plan to include critical infrastructure protection strategies for police and fire facilities.	No	High	Short term	Pending funding source	Administrative costs	HMGP, FMA, PDM, CDBG

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Secure water towers and wellheads by enclosing them with approximately 1,200 feet of fence.	Yes	Moderate	Short term	Completed	35,000	DEMA
Route 5 storm-water management strategy study	Yes		N/A	Completed	30,000	Coastal Management Grant

POC: Kristy Rogers, 302-684-4110
Floodplain Manager: John Collier, 302-684-4110
Main Hazards: Flooding, Storm Water Management

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Ocean View

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Ocean View	X		X	X		X			X		X	X		X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
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CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Ocean View	Update in Progress 2010 completed revised again in 2012

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Ocean View	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Ocean View	9/03/80

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Ocean View	~~L~~M	~~L~~M	~~L~~M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Ocean View							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Improve the Town's stormwater management system in some of the older sections of the Town (County Village, County Estates, Meyle Estates, Corner of Daisy and Woodland Avenue, West View Development, and Cottages on Whites Creek). These improvements would include engineering costs to redesign or improve the drainage systems, and the costs to reconstruct and repair swales, drains and culvert piping, and ditches.	Yes	High	Ongoing	In Progress Partially complete	750,000 done / outstanding work 3 million	Yes
2	Improve evacuation routes throughout the Town.	Yes	High	~~12 months~~Ongoing	~~Not started~~In progress	2 million	Yes
3	Implement public education and awareness activities to advise residents and visitors about hazards, hazardous areas and mitigation techniques they can use to protect about hazards, hazardous areas and mitigation techniques they can use to protect themselves and their property.	Yes	Moderate	Ongoing	In Progress	5,000	Yes
4	Adopt a tree management ordinance and maintenance program.	Yes	Moderate	Ongoing	In Progress		No
5	Purchase and install GIS to map hazardous areas and events.	Yes	Low	2-3 years	~~Delayed due to funding~~ in progress/development	10,000	
6	Adopt a building code ordinance for the Town.	Yes	Low	12-24 months	Complete, adaptations In Progress		
New Mitigation Actions							
7	Storm water management projects (3) drainage for roads					750,000	
8	(3) shovel ready stormwater management projects awaiting easement rights.					1.5 million	
9							
10							

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SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				
	Stormwater Drainage pipe system install	Central Ave - 100 feet (Banks Bennetts Tax Ditch floods)	500.00	
	Stormwater Drainage pipe system install	Hudson Ave - - 100 feet (Banks Bennetts Tax Ditch floods)	500.00	

1) Intent to participate form: Yes
2) POC: Charles F McMullen
3) Floodplain Manager: Charles F McMullen
4) Main Hazards: Flood, Wind, Snowstorm
5) Jurisdiction Population: 1900 2010 Census

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Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

City of Rehoboth Beach

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Rehoboth Beach		X	X	X	X	X	X		X		X		X	X	X	X	X	X	X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
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NFIP – National Flood Insurance Program
CRS – Community Rating System
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SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Rehoboth Beach	Revised 2014

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Rehoboth Beach	6

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Rehoboth Beach	3/30/73

B-4

CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Rehoboth Beach	N/A	N/A

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Rehoboth Beach	H	M	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Mitigation Actions Started / Completed since 2010 Plan Update						
Potential / New Mitigation Actions For Consideration						
Storm-water management system town wide	Yes	High	Short-term	Pending funding source	9 million	HMGP, FMA, PDM
Elevation and engineering study for barrier protection on County Road 300. (In A/V Zone)	No	High	Short-term	Pending funding source		HMGP, FMA, PDM
Wilmington and Delaware Ave storm-water management study	Yes	High	Short-term	Pending funding source	50,000	HMGP, FMA, PDM
Develop multi-lingual community outreach	No	High	Short-term	Pending funding source		HMGP, FMA, PDM, CDBG

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Project Description	Adopted	Priority	Timeline	Status	Estimated Cost	Potential Funding Source
Previous Plan Mitigation Actions Review						
Build retaining wall along boardwalk to prevent damage to businesses, the boardwalk and our street ends.	Yes	High	N/A	Completed		USACE, DENREC
Conduct drainage improvements on First Street to increase efficiency by increasing piping capacity.	No	Moderate	N/A	Completed		HMGP, FMA, PDM

POC: Keith Bard – 302-227-4640
Floodplain Manager: Damalier Molina
Main Hazards: Winds, Beach Erosion, Flooding

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

City of Seaford

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

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Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Relevant Plans and Programs in Place

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
City of Seaford		X	X	X		X	X		X	X		X	X	X	X	X	X	X	X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
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SMP – Stormwater Management Plan
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NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Seaford	Certified (2003) Certified 2008 Updated 2015

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Seaford	6/6

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Seaford	2/01/79

B-4

CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
Seaford	10/1/96	9

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Seaford	M	~~L~~M	~~L~~H

SECTION C: Mitigation Actions Review

Mitigation Actions Review

City of Seaford							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Conduct computer modeling of key drainage in and around the City to identify restrictions and/or potential problems. Also identify necessary modification or repairs to improve functionality.	Yes	High	24 months	~~Started~~In process	Zero cost	Yes
2	Address street flooding in the Washington and State Street area- identify necessary modification or repairs to improve functionality.	Yes	High	24 months	~~Started~~Completed	1.99 million	
3	Ensure security of water production sites and storage facilities.	Yes	High	24 months	Delayed		Remove
4	Develop agreements with local businesses to assist during emergencies (i.e., provide items such as heavy equipment and other resources).	Yes	Moderate	12 months	Delayed		Remove
5	Identify key personnel to manage a crisis.	Yes	Moderate	12 months	Delayed		Remove
6	Construct storm drain improvements on Washington Street to increase the drainage capacity of the area and prevent future flooding.	No	Moderate	12 months	~~Not started~~Completed	Same project as 2	
7	Construct stormwater drains on Porter Street to increase the drainage capacity of the area and prevent future flooding.	No	Moderate	12 months	~~Not started~~Completed	750.00	
New Mitigation Actions							
8							
9	Stormwater management system Virginia Ave (regional system project to protect rep loss properties due to improper construction.				Completed	200K	
10							
11							
12							
13							
14							
15							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				

1) Intent to participate form:
2) POC: Charles Anderson Assistant City Manager
3) Floodplain Manager: Joshua Littleton Building Offical
4) Main Hazards: Flood, Wind, Winter storm
5) Jurisdiction Population: 7200 2010 Census

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Selbyville

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Selbyville	X		X	X	X	X			X		X	X	X	X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Selbyville	Certified (2007)

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B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Selbyville	8

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Selbyville	7/16/91

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Selbyville	~~L~~M	~~L~~M	M

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Selbyville							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Replace deteriorating bridge and culverts on Railroad Avenue over major storm water management ditch.	No	High	6 months	Delayed due to funding.	1.2 million	Y
2	Educate residents and improve public awareness on being better prepared to face hazards.	No	High	Ongoing	~~Not started~~ Active	4000 start up 2500 annual	
New Mitigation Actions							
3	Storm Preparedness Plan: plan calls for community alerts, storm vulnerable materials removal by public works	July 2015	High	N/A	Active	Minimal built in	
4							
5							
6							
7							
8							
9							
10							

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SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				
		N/A		

Flooding
Wind
Snowstorm

Current population : 2342 as of 2014 (full time residents)

Floodplain Manager Mike Deal (Town Administrator) 2015

POC: W. Scott Collins (Chief of Police) www.selbyvillepolice.com 302-436-5085

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of Slaughter Beach

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
Slaughter Beach			X						X			X		X	X	X	X		X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
Slaughter Beach	In Progress

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
Slaughter Beach	8*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
Slaughter Beach	7/02/80

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
Slaughter Beach	L	L	L

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of Slaughter Beach							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Improve stormwater drainage throughout the Town.	Yes	High	24 months	Delayed		
2	Flood-proof water pumping stations.	Yes	High	24 months	Delayed		
3	Elevate access and evacuation roads that flood (Route 224 - Slaughter Beach Road approximately 1' - 4' from intersection of Bay Avenue to west boundary of Prime Hook National Wildlife Refuge (± 1 mile).	Yes	High	24 months	Delayed		
4	Elevate flood-prone homes.	Yes	High	24 months	Delayed		
5	Perform regular beach re-nourishment.	Yes	High	Ongoing	Delayed		
6	Develop automated telephone warning system.	Yes	High	When funds become available	Not started		
7	Restore and/or renourish beach and protective dunes.	Yes	High	When funds become available	Not started		
8	Develop a strategy to improve NFIP enforcement processes to include local permitting processes.	Yes	High	6 months	Delayed		
9	Provide building/zoning/flood zone ordinances to public via Web site or other electronic means.	Yes	Moderate	When funds become available	Not started		
10	Initiate stormwater management system improvements along ± 1 mile of North Bay	Yes	Low	When funds become available	Not started		
New Mitigation Actions							
11							
12							
13							
14							
15							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
Current Pending Mitigation Actions				

1) Intent to participate form:
2) POC:
3) Floodplain Manager:
4) Main Hazards:
5) Jurisdiction Population:

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update Workshop Interview Package

Town of South Bethany

Workshop Purpose:
To review and update county and municipal capabilities that may have changed, improved or degraded, since the 2010 Hazard Mitigation Plan update.

Why a Capabilities Assessment:
The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

Instructions by Section:

Section A - Relevant Plans and Programs in Place.

Review the plans and programs that were identified within the 2010 plan for your jurisdiction. Identify any changes during the workshop interview.

Section B - Significant indicators for local jurisdictions ability to implement mitigation strategy.
Not all jurisdictions have all four B subsections.

B-1 - Local Comprehensive Plan Update

B-2 - Building Code Effectiveness Grading Schedule (BCEGS)

B-3 - National Flood Insurance Program participation

B-4 - Community Rating System Participation

B-5 - Self-assessment of Local Capability

Review each table entry from the 2010 plan update. Be prepared to verify entry during the workshop interview.

Section C - Mitigation Actions Review

Review the current list of mitigation actions found within the 2010 plan. Be prepared to identify those actions that will remain or be removed from the plan update. The workshop interview is designed to address the mitigation actions specifically and in as much detail as you deem appropriate.

Section D - Historical Completed Mitigation Projects Review.

Review for accuracy of completed projects and be prepared to provide the identified information on any projects that have commenced after completion of the 2010 plan update.

Section E - NFIP Questions Matrix (**For Sussex County Only**)

Verify previous plan matrix answers, be prepared to discuss any changes during the workshop interview.

SECTION A: Relevant Plans and Programs in Place

Capabilities Review

Jurisdiction	HMP	DRP	CLUP	FMP	SMP	EOP	COOP	REP	SARA	TRANS	CIP	REG-PL	HPP	ZO	SO	FDPO	NFIP	CRS	BC
South Bethany		X	X	X		X	X		X		X	X		X	X	X	X	X	X

HMP – Hazard Mitigation Plan
DRP – Disaster Recovery Plan
CLUP – Comprehensive Land Use Plan
FMP – Floodplain Management Plan / Flood Mitigation Plan
SMP – Stormwater Management Plan
EOP – Emergency Operations Plan
COOP – Continuity of Operations Plan
REP – Radiological Emergency Plan
SARA – SARA Title III Emergency Response Plan
TRANS – Transportation Plan
CIP – Capital Improvements Plan (that regulates infrastructure in hazard areas)
REG-PL – Regional Planning
HPP – Historic Preservation Plan
ZO – Zoning Ordinance
SO – Subdivision Ordinance
FDPO – Flood Damage Prevention Ordinance
NFIP – National Flood Insurance Program
CRS – Community Rating System
BC – Building Codes

SECTION B: Abilities Indicators

B-1

Local Comprehensive Plan Updates

Jurisdiction	Plan Status
South Bethany	Complete (10 year re-cert 2016) pending

B-2

BCEGS Grades for Sussex County Jurisdictions

Jurisdiction	BCEGS Grade
South Bethany	*Declined Participation*

B-3

NFIP Participation in Sussex County

Jurisdiction	NFIP Entry Date
South Bethany	10/6/76

B-4

CRS Communities in Sussex County

Jurisdiction	CRS Entry Date	Current CRS Class
South Bethany	10/1/07	8

B-5

Self-Assessment of Local Capability

Jurisdiction	Technical Capability	Fiscal Capability	Administrative
South Bethany	M	L	~~M~~H

SECTION C: Mitigation Actions Review

Mitigation Actions Review

Town of South Bethany							
Action	**Description**	**Adopted**	**Priority**	**Timeline**	**Status**	**Estimated Cost**	**Remain in Plan**
1	Implement regular and emergency beach replenishment or re- nourishment as part of the DNREC/ Corps of Engineers 50-year plan.	Yes	High	Ongoing	In Progress		Y
2	Improve stormwater drainage throughout the Town.	Yes	High	Ongoing	In Progress		Y
3	Continue to identify and promote flood-proofing/elevation solutions to at-risk homes throughout the Town in accordance with current FEMA regulations.	Yes	Moderate	Ongoing	In Progress		Y
4	Upgrade the Town's Building and Zoning Ordinances to reflect NFIP and ISO requirements.	Yes	Moderate	12 months	~~In Progress~~Complete	$1000	
New Mitigation Actions							
5	Flood elevation one house				complete		
6							
7							
8							
9							
10							

SECTION D: Historical Completed Mitigation Projects Review

Historical Completed Mitigation Projects Review

Jurisdiction	Project	Description	Cost	Status
HMGP Project Funding				
South Bethany	Coastal Sewer Flood-proofing Near South Bethany	Elevate manhole openings, flood-proof hatch-cover doors where opening are in roadways, elevate electrical components in water proof cabinets in sanitary sewer system.	$74,548	Dec-97
South Bethany	South Bethany Emergency Pamphlet	Develop an emergency pamphlet for renters in South Bethany.	$2,162	Aug-96
South Bethany	South Bethany Ocean Drive Flood Protection	Construct rip-rap along Ocean Drive to protect homeowner's properties, Ocean Drive roadway, and infrastructure from future coastal storms.	$60,524	March 2000
FMA Project Funding				
South Bethany	South Bethany ~~Elevation Project~~	Elevate ~~two oceanfront~~one bayside house~~s and two adjacent houses on pilings~~.	???59,000	2000 (open)
Current Pending Mitigation Actions				
Same as above	Flood elevation	Back bay (204 Carlisle Road/Drive)	59,000	Construction complete (paperwork open
	Sea level Rise Committee formed	Elevation mapping of entire town	10,000	ongoing
	Public Outreach by Sea Level Committee		???	ongoing

1) Intent to participate form: will do
2) POC: Melvin A Cusick
3) Floodplain Manager: Joe Hinks (Code Enforcement Constable)

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4) Main Hazards: Flood, Wind
5) Jurisdiction Population: 1400 - (485 fulltime) 2010 Census

MALLARD LAKES SUBDIVISION PUBLIC INPUT MEETING AGENDA

9/1/2016 9:00 – 11:00 AM

Mallard Lakes Community Room

1. Welcome and Opening Remarks

2. Hazard Mitigation Plan Update Project Overview and Update

3. Public Review Period and Access to Draft Hazard Mitigation Plan

4. DEMA and FEMA Approval Process

5. Public Comment (limited to 3 minutes per person)

6. Adjourn

MALLARD LAKES 2016 HAZARD MITIGATION PLAN MEETING NOTES

9/1/2016

Date and Location: A Hazard Mitigation Plan (HMP) Update Meeting was held on September 1, 2016 at 9:00 AM at the Mallard Lakes Community Room.

Participants: Mallard Lakes Residents and representatives from the State of Delaware, Sussex County, and Sussex County contractor, Olson Group, LTD.

Purpose: The purpose of the meeting was to provide an overview of the Hazard Mitigation Plan update process plan changes, and next steps. Notes regarding discussion between attendees during the meeting are provided below.

Discussion

County Administrator Todd Lawson opened with a discussion of the purpose of the meeting and an invitation to residents who wish to attend an additional public meeting that at 1:30 at the County Emergency Operations Center to discuss the Plan.

Adam Montella, of the Olson Group Ltd., then provided an introduction of the Hazard Mitigation Plan and, its purpose, and the process through which it was updated.

- Mr. Montella commented on the Uniqueness of communities (25 cities and towns) in Sussex County, Delaware
    - County is also treated as own jurisdiction
    - Cities and Towns have differing capabilities
- Hazard Mitigation Planning and FEMA
    - HMP is a requirement for funding
    - EOP, COOP are required as well for other funding streams
- The role of the community
    - There is a forum online for any and all public comment to be submitted in regards to the current draft of the HMP
- Maintenance and update time
    - The plan will be updated throughout its approval process to include public remarks and further information
- How Unincorporated communities are covered under HMP
    - Local fire companies are first line of defense
    - County emergency management coordinates shelter, evacuation, and training, plus classes, meetings, etc.
- Mr. Montella then introduced the methodology behind the Hazard Mitigation plan
    - Overview of time table and plan conception
    - Scientific look at mitigating disaster
        - Strategies to reduce impact of disaster
- Mr. Montella explained the role of citizens in emergency management

- Emergency management is also the role of citizens
  - County will cover the community regardless, but preparedness starts at home
- Family/community disaster and emergency plans
  - CERT teams to increase local involvement and effectiveness during disasters
    - Community would like CERT plan included in HMP
    - Proposed mitigation strategy that says it will support Mallard Lakes community in private and public funding opportunities in order to create a CERT plan
- Community Plan – First Responders – EOC Plan with FEMA and DEMA supported response

- Difference in assessment periods/coverage
  - What Changes?
    - Mitigation doesn't look at liability, but strategy and prevention
    - Simply allows for grant requests and funding opportunities
      - HMP and CERT helps to achieve "competitive" grants
      - Corporations can also provide money and funding
- 2010 Plan and Mallard Lakes
  - Residents felt there was no mention of unincorporated community in plan
    - Community felt left out
    - Community would like it to be codified that HOAs have emergency management plans
    - Mr. Montella explained that County portions of the Plan included all the unincorporated areas of the County.
      - Joe Thomas, Emergency Operation Coordinator for Sussex County discussed the County's role in response and recovery
        - "Our purpose is to coordinate response and recovery"
        - Pushing out info through media at all times to inform public of impact of disasters and lead to decisions
        - During damage assessment EOC does a public survey to understand the damage in the area.
        - Seasonal homes do not get counted by FEMA, solely primary residents are counted in the federal assessment
- Seasonal versus Year Round Residency
  - Does that effect plan?
    - It can affect grants
    - Anthony Mangeri of the Olson Group Ltd. described the grant process
      - FEMA provides assistance to those with unmet needs
      - Few people get Individual and family grants
        - Most get loans based on capability to repay
      - Must qualify for the grant

        - Hard to receive hazard mitigation grant for seasonal home due to its classification of income property
            - There is no unmet need
    - FEMA does not look to disqualify on percentage of Seasonal vs Full Time, but on basis of unmet/met need
    - SBA loans are also available
- SBA Loans
    - So many of residents of Sussex County are in seconds home
    - Community views SBA as entity for a business, not secondary homes
    - Anthony
        - SBA loans can be used with 25 or more units with significant damage, defined by value of the unit
        - Flood insurance is tool to mitigate water in home
    - Pete Dennen of the Olson Group Ltd. provided further clarification
        - Some of the communities have opted for the adoption of disaster mitigation education programs which would address the misinformation, or lack thereof, regarding other funding sources available
    - Mr. Montella went on to talk about Sussex County's disaster education program
        - Sussex county has a large education program to inform people of appropriate avenues during a disaster

Mr. Lawson then engaged the attendees to address the question "What does this plan mean for you?"

- Mallard Lakes was unsuccessful in receiving grant money after hurricane Sandy
- How can Mallard Lakes ensure preparedness so that the issues of Hurricane Sandy do not repeat themselves?

Mr. Montella began to introduce the document, the information it updates, and what the community can expect from its implementation.

- The current plan captures damages from post-2010 and includes repeated loss figures, as well as estimated growth of communities.

Mr. Mangeri then introduced the pieces of the Hazard Mitigation Plan

- HMP is designed to provide a strategy
    - Plan is not a contract, nor does it obligate anyone to anything
- The University of Delaware was thanked for its role as a partner in operating HAZUS, FEMA's disaster simulation tool.
- Mr. Montella addressed a question from the audience on what FEMA provides after a disaster
    - FEMA rarely provides direct cash contribution in the wake of disasters
        - Their goal is also to return area to pre-existing condition
    - He commented that the cost of not having insurance is far greater than cost of insurance

Role of county in spending the FEMA money

- Mr. Dennen described the Hazard Mitigation Grant process
    - State is grantee, Sussex is sub-grantee
        - Money is spent by community and then reimbursed by FEMA as each phase is completed in a grant
        - If the phases are not completed in accordance to FEMA standards, the community may be liable to return the grant money

Mr. Montella then addressed other questions about the plan from the community

- The community brought up the change in Floodplain level by FEMA over the last few years
    - 2013 – 7 feet, 2015- 4 feet
    - The county appealed the FEMA recommendation and were unsuccessful
    - No units were out of compliance due to the flood level at time of construction decades ago
- The Community felt that the updated plan should review the past goals and their level of completion
- The Community also commented that the permitting process and enforcement of codes should be internally reviewed
- The Community then suggested that financial help should be provided to raise the elevation of homes in the area to be above 7 feet
    - They do not accept the FEMA recommendation of 4 feet
    - Floodplain Maps are updated every 7-8 years
        - This includes changes to floodplain level
- Community feels that building above the floodplain level should be mandatory and included in plan

Mr. Montella then provided closing remarks and, again, invited residents to the working group meeting in Georgetown

- Mr. Montella then invited residents to add comments to the online forum where the document will be posted.
- He closed by stressing that hazard mitigation and emergency preparedness are a community issue

Hazard Mitigation Plan Update Project Points of Contact (POCs)

Sussex County:

Joe Thomas
302-855-7801

The Olson Group, Ltd.

Adam Montella, Project Manager
813-657-5395

Anthony Mangeri, Sr. MPA, CPM, CEM Lead Planner
856-217-9172

Attendee List

The Sign-In Sheet is found on the following page.

Mallard Lakes -Sign In Sheet

John Caprari unit 398
Shirley Wiley Unit 397 shywi@comcast.net
Joyce Valdivia Unit 174 dfvaldivia@msn.com
Bruce Henry Unit 465 bruce_henry@verizon.net
[illegible] # 271 huntntsea@comcast.Net
Melissa Golden Unit 269 goldencomm@comcast.net
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David Wilson Unit 388
Donna [illegible] LID
Arnold Lohfink Unit 380
Frank + Jessie Marden unit 183
Jeff Shockley Sussex County jshockley@sussexcountyde.gov
Brad Whaley Sussex Cty bwhaley@sussexcountyde.gov
Adam Montella Olson Group amontella@olsongroupltd.com
Joe Thomas Sussex County jthomas@sussexcountyde.gov

Sussex County Multi-Jurisdiction Hazard Mitigation Plan Update

Hazard Mitigation is any action taken to reduce or eliminate long-term risk to people and property from natural hazards.

HMP Update Project: The purpose of this grant-funded project is to update the County's existing Hazard Migration Plan. The project involves stakeholders from the County, each municipality, DEMA and other Delaware agencies, University of Delaware, and the public.

Where we are with the Update:

- All Sections of the Plan are completed in draft form for final review by the Hazard Mitigation Steering Committee and Working Group and an open public comment period. One final Appendix will be added after the final meeting, which includes the supporting documentation for the planning process (meeting agendas, sign-in sheets, meeting notes, and presentations). The next step is for Sussex County to Submit for DEMA and FEMA review and approval.

- We have taken steps to engage the community in the process. The project has a web presence on the Sussex County EOC website. Residents are able to review the draft document and provide feedback for discussion within the working group.

- We have held public meetings to include presenting the intent of the update to the County Planning and Zoning Commission.

- The draft Plan will be submitted to DEMA in September and to FEMA for Review and Approval in October.

- We will come back before Council after FEMA Approval for adoption and seek municipal adoption at that time.

HMP Steering Committee, Working Group, and Open Public Combined Planning Meeting Notes

9/1/2016

Date and Location: A Final Planning Meeting for the Hazard Mitigation Plan (HMP) advertised to the public for Steering Committee, Working Group, and open Public Comment on the draft Hazard Mitigation Plan update was held on September 1, 2016 at 1:30 PM at the Sussex County Emergency Operations Center.

Participants: The participants for the meeting included members of the public, representatives from the State of Delaware, Sussex County, Sussex County municipalities, comprising the Steering Committee and Working Group, and representatives from the Sussex County contractor Olson Group LTD, responsible for developing the Hazard Mitigation Plan update.

Purpose: The purpose of the meeting was to provide review the draft Hazard Mitigation Plan (HMP) update with the HMP Steering Committee, Working Group, and members of the public, discuss next steps, and formally begin the public comment period for the Hazard Mitigation Plan update. Discussion and agreements made between meeting attendees during the meeting are provided below.

Overview of Activities

Welcome and Overview: Joseph (Joe) Thomas, Director of the Emergency Operation Center for Sussex County, opened the meeting with an explanation of the Hazard Mitigation Plan and its purpose.

The floor was then turned over to. Anthony Mangeri, of the Olson Group LTD.

- Mr. Mangeri provided an explanation working draft, steering committee, and working group
- Stated the purpose is to make sure the document is on track and public is aware of its contents
- Mr. Mangeri stressed that the Hazard Mitigation Plan is not a contract, no binding in any way
- Community asked who was contacted in regards to document
    - Working groups, county officials, town administrators
    - Community also asked if previously flooded areas were contacted
        - Yes
- An explanation of FEMA's HAZUS software was given
    - The software provides a statistical analysis of disasters and their impact
    - County GIS ran the software

Draft Plan Review: Mr. Mangeri then began a section-by-section presentation of the draft HMP update.

Section I

- Overview of sections and table of contents

- Methodology
  - Identify threats
  - Asses the risks and harms
  - Analyze Current Capabilities
  - Incorporate plans and recommendations
- Appendix A
  - Highlights each municipality which participated in the workshops
    - Jurisdictions will adopt by resolution following FEMA and DEMA approval
- Goals and Objectives
  - Prior goals were assessed to see progress and build on previous iterations of the section
- Participating Communities
  - 4 of 24 did not participate in the HMP
    - Did not attend meetings or working group sessions
    - Blades, Dagsboro, Ellendale, Dewey Beach
- Green areas indicate information that is yet to be attained
  - As information is attained the website will be updated to reflect an accurate draft

Section II

- The planning process
- Lists involved parties in the Mitigation Steering Committee
  - Highlighted the work of UD on the project
  - Olson group team is also listed
- Data Collection
  - Highlighted critical facilities
    - CF being fire companies, police stations, medical facilities, etc
- Hazard Mitigation Working Group List
- List of meetings
- Process
  - Public involvement, other interested parties
- Floodplain Administrator list
  - Also contains Municipal Points of Contact
- Federal Documents and Data Utilized
  - Why it was used
  - How it was used
- Delaware State Hazard Mitigation Plan and Counties

Section III: Hazard Identification

- Examined various types of Hazards and their history
  - Ranked based upon risk, concern, and history
    - If there was no historical ranked data (I.e. Volcanoes) no ranking was given

- Narrative discussion of risks and data consulted
  - The information contained in the draft Plan update is current as of the end of 2015 as of 2015
  - The information contains data regarding the identified hazards such as wind events, lightning strikes, hurricane, extreme heat, winter storms etc.
  - Nor-Easters comprise their own category separate from hurricanes
  - The information is localized for Delaware and combined with other national information.
- CPRI
  - Each box has a 0-5 value based on historical frequencies, duration, and damage
  - These values are added to a formula and calculated to produce a ranking, which is then presented to the steering committee.
- Mercalli Scale for Earthquake
  - Calculates the severity of a quake and their potential
- Wildfires
  - The definition of a wildfire is fairly lenient
    - Instances listed include approximated size and impact
- Coastal Erosion
  - Is not currently a major issue, but has been brought to the attention of the public so that a discussion can be started on solution and mitigation
- Dam Failure
  - There is a difference in information between national and state level data
    - Public input is being sought to rectify that section
  - May be a discrepancy between public and private dams
- Terrorism
  - Terrorist activity is included in order to encourage preparedness
  - The threat of terrorism is viewed as fluid, and as such should be prepared for.
- Pipeline
  - The Working Group requested a look into gas pipelines
    - Most pipelines are new and built to higher current standards
- Probability/ Magnitude Tables and Ranking
  - Explains the methodology behind the ranking of disasters
  - Floods, Thunderstorm, and Hurricanes topped the list

Section IV: Hazard Vulnerability

- What will each hazard effect?
  - This includes building stock and population
- HAZUS
  - This section includes a discussion on the methodology, science, and calculations behind the HAZUS program
  - HAZUS takes into account the cascading effects of critical facility damages and loss during disasters
  - Includes what has been lost, and a projection of what could be lost

- Census data
  - The data found in the US Census is based on the Census blocks depicted in a graphic found in this section
- The community is concerned as to whether part-time residents are included in the plan
  - The data regarding seasonal population is incorporated, when available, in Appendix A
- Loss Data
  - Loss data is based on historical record
  - The narrative works to explain the significance of HAZUS results
- Summary Sections
  - Includes every incorporated community and the county
    - Tables the results of expected loss for the varying disasters analyzed through the HAZUS simulation
- Unique Risks
  - Bethany Beach, Ellendale, and other coastal communities inquired about beach erosion, however beach erosion is not considered in a Hazard Mitigation Plan.

Section V: Capabilities Assessment

- Assessment were conducted at the local level with officials and community members
- Assessment inquired as to whether jurisdictions had emergency operations plans, zoning plans, regional plans, hazmat plans, and other precautions to prepare for certain risks
    - This section also includes a narrative discussion of these plans
  - More jurisdictions are doing more about risk management and risk reduction in their community
    - These plans show FEMA continuity and increased efforts towards attaining funding
- Rating scale of department efficiency by jurisdiction
  - Also includes a rating of fire departments
    - Leads to a "grade" and influences insurance costs
- NFIP Involvement
  - The document looked at participants and whether they were a member of the NFIP
  - 3/16/2015 provided updated FEMA information of flood plain
- Communities Rating System
  - 7 communities are involved
    - Leads to a 5-6% discount on insurance
  - More participation in community leads to a discount in flood insurance
- Self-Assessment
  - The HMP asked jurisdictions to review their own capabilities
    - This was a subjective study
  - County believes it has more financial resources than past years
- Recommendations
  - Modified to remain in line with 2010, yet provide an update

- Conclusion on Local Capability
    - County is going through a period of sustained growth. This growth proves difficult to measure due to seasonal residents

Section VI: Mitigation Strategy

- HMP seeks to target the reduction of inventory of NFIP

Section VII: Plan Monitoring and Maintenance

- As soon as first entity adopts the plan, the 5-year cycle restarts
- Section also includes a recommendation for the methodology used in the prior sections
    - Allows for the continual update and improvement to information and strategy

Annex A:

- Focuses on individual counties, their capabilities, and Mitigation Actions
    - Mitigation Actions are goals, not commitments

The community expressed concern as to the inclusion of unincorporated area and the difference between sections of the county (i.e., agricultural versus resort areas)
Joe Thomas responded by stating:

- Community is asked to report damages in private areas
- The county cannot enter and survey damage on a private land

The community expressed concerned as to the accuracy of public reporting and request codification from the state level in order to better analyze damages during disasters
The community is also concerned as to the level at which preparedness is discussed in the document. They do not feel they are informed as to the process of evacuation, nor where to go in such an instance.

- The community sites unincorporated areas as a concern, stating that the County does not have the ability to fully represent them and provide for them fiscally
    - Administrator Todd Lawson addressed the audience and opened a dialog
        - Acknowledges the lack of communication unincorporated communities have and urged community members to become more involved in emergency management activities, training, and other educational opportunities
- The community also expressed concern over the identification of shelter and the timeframe in which they are identified
    - Joe Thomas and Todd Lawson addressed this issue
        - This issue with a pre-designated shelter is that it does not account for roads being rendered unusable or other circumstances preventing the use of a particular shelter during a disaster.
        - While there is a list of designated shelters, the type, size, and scope of the emergency dictates the shelters that are ultimately opened during the emergency
- The community would like to include more unincorporated areas to attain their personal input and representation in the plan
- The community also request that people be considered more, not just property

Next Steps: Adam Montella from OGL explained the draft plan would be posted on the Hazard Mitigation section of the County website for public comment until Friday, September 9. Mr. Thomas will also be emailing the draft HMP update t the Steering Committee, Working Group, and Neighboring counties for review and comment. OGL will finalize the draft plan from the comments received, then Sussex County will submit to the Delaware Emergency Management Agency (DEMA) and the Federal Emergency Management Agency (FEMA) for review and pending approval. With "Approval Pending Adoption" the County and municipalities will adopt by resolution, beginning the next five-year update cycle.

Outstanding Actions

The following actions remain:

- OGL to send out notes from this meeting.
- Sussex County to post notes and draft HMP update to the County website for review and comment. Comments due by September 9.
- Sussex County to send a copy of the draft HMP to the HMP Steering Committee, Working Group, and neighboring counties for review and comment. Comments due by September 9.
- OGL to make final plan changes and Submit to Sussex County Emergency Operations Center by September 13.
- Sussex County to submit HMP Update to DEMA and FEMA for review and approval by September 16.
- Modifications based on DEMA and FEMA review and formal adoption, dates TBD.

Hazard Mitigation Plan Update Project Points of Contact (POCs)

Sussex County:

Joe Thomas
302-855-7801

The Olson Group, Ltd.

Adam Montella, Project Manager
813-657-5395

Anthony Mangeri, Sr. MPA, CPM, CEM Lead Planner
856-217-9172

Attendee List

The Sign-In Sheet for the meeting is attached.

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update
Steering Committee/Working Group Draft Plan Meeting
September 1, 2016

SIGN-IN SHEET

Name	Title	Organization	Phone	Email
DAVID WILSON				
FRAN LAZEROW	PRES/ML CHAIR	Southern Sussex Co Community Action Group	302 436 5696	flazerow@aol.com
Jeanette AKnter	Land Use Chair	Southern Sussex County Citizens Group	302 604 7523	jeaknter@gmail.com
Mohammad AKnter	medical Preparedness	Refuge HOA	202-277-7283	mohammad.aknter2@gmail.com
Nancy & Ken Flacco	Secretary	Southern Sussex County	302-388-	papitbull@aol.com
~~Jesse Savage~~	~~Town Manager~~	Community Action Grp	6756	
Jesse Savage	Town Manager	Bridgeville	(302) 337-7135	jsbridgeville@gmail.com
JOHN MCD ONNELL	TOWN MANAGER	GREENWOOD	302 349 4584	JMCDONNELL@TOWNOFGREENWOOD.US
DANNY VERRETT	Resident	Swann Keys	443-223-1099	Mdeuting@Hotmail.com
RONALD A. YOUNG	V.P SWANN KEYS Civic ASSN	SWANN KEYS	410-703-3698	0345ronnie@gmail.com
ROBERT E BAILEY	RESIDENT	ASHLEY MANOR	301-524-8103	cdbailey1@verizon.net
Carole Bailey	Pres. Ashley Manor	ASHLEY MANOR HOA	302-524-8103	cdbailey1@verizon.net
Jack & JOHANNA Beall	Home Owner	BAY Forest Com.- Sussex Co	302-616-1695	bhannajo@gmail.com
Barbara Shamp	Home owner	Southern Sussex County Community Action Group	301-518-1200	cherokka28@gmail.com
Milt Warren	Resident-Emer. Plan	Kenwick Sound	443-497-0057	Milt.Warren@Comcast.net
ROBERT BAUER	RESIDENT	SWANN KEYS	443-844-890	bobbauersr@yahoo.com
Jamie Smith	Town Manager	Laurel	3027852277	lgurltm@comcast.net
PATRICIA SoLAN	RESIDENT	SSCCAG	302-436-8124	SoLANjp@COMCAST.NET
Melissa Golden	MALLARD LAKES CONDO OWNER		717-881-2482	goldenrcamm@comcast.net
BRUCE FRYE	TOWN COUNCIL	BETHANY BEACH	302-537-5072	bfrye6@yahoo.com
CHARLOTTE FRYE	HOMEOWNER	Bethany HOA	"	"
Dianne L. Vogel	Town Manager	Town of Ocean View	302 539-9797	townmgrtov@oceanview.de.com
WALTER F. CUNEAN	MAYOR	TOWN OF OCEAN VIEW	215 620-1644	CUFCALLC@GMAIL.COM
Elaine D. Fike	library director	Georgetown Public Library	856-7958	elaine.fike@lib.de.us
Scott Collins	Chief of Police	Town of Selbyville	302.436.5685	scott.collins@CJ.STATE.DE.US
Megan Nehrbas	GIS Manager	Sussex Co.	302 855 1176	mnehrbas@sussexcountyde.gov
ROBERT LONGO	CHIEF OF POLICE	TOWN OF MILTON	302-684-2547	Robert.longo@CJ.STATE.DE.US
Kristy Rogers	Town Clerk	Town of Milton	3026844110	Krogers@ci.milton.de.us

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update
Steering Committee/Working Group Draft Plan Meeting
September 1, 2016

SIGN-IN SHEET

Name	Title	Organization	Phone	Email
Charles Anderson	Asst. City Mgr	City of Seaford	629-9173	[illegible]
SARA BYNUM-KING	TOWN Mgr.	Town of Delmar	846-2664	townmgr.delmar@verizon.net
Ellen Lorraine McCabe	Financial officer	City of Lewes	645-7777	emccabe@ci.lewes.de.us
Paul Eckrich	City Manager	City of Lewes	645-7777	peckrich@ci.lewes.de.us
Eric Norenberg	"	City of Milford	424-8394	enorenberg@milford-de.gov
Arthur D. Paul	State Haz Mitigation	DEMA	659-2253	Arthur.Paul@state.de.us
Walter W. Brittingham			236-1020	Walterbgr@gmail
MELVIN CUSICK	TOWN MANAGER	SOUTH BETHANY	537-3653	TOWNMANAGER@SOUTHBETHANY.ORG
Joseph Hinks	Code Enforcement/Flood plain	Town of S. Bethany	539-3653	inspector@southbethany.org
Dean A. Campbell	Attorney	Millsboro Lake Homeowners	854-9750	dean@campbelllaw.org
MICHAEL E. SMITH	LOCAL HOA SAFETY	KEEN WIK ON THE BAY	302-988-1119	OCEANCITYMIKE@MSN.COM
Anne M. Allen	-	.	302 541-0934	anne.allen139@gmail.com
Bob WOOD	~~TOWN~~ OF SEC.	TOWN OF SLAUGHTER BEA	302-228-2374	WOODWEIL418@GMAIL.Com
KATHY LOCK	TREASURER	" " "	302-422-5234	KMLOCK@COMCAST.NET

Page ___ of ___

FOR OFFICIAL USE ONLY

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update
Steering Committee/Working Group Draft Plan Meeting
September 1, 2016

SIGN-IN SHEET

Name	Title	Organization	Phone	Email
Emory R West Jr	Councilman	Town of Milton	302-258-8332	CouncilmanWest@ci.milton.de.us
JERRY CLUNAN	HOME OWNER	MALLARD LAKES	717 471 7928	JERRY@MYFINANCIALPLANNER.COM
PHILIP F. GOLDEN	HOME OWNER	MALLARD LAKES	717-779-4882	pfgolden@comcast.net
CHARLES McMULLEN	ADMINISTRATIVE OFFICIAL	OCEAN VIEW	302 539 1208	ADMIN@OCEANVIEW.DE.COM
MARIA COUNTS (MEDIA)		COASTAL POINT	302.539.1788	MARIA.COUNTS@COASTAL POINT.COM
GENE DVORNICK	TOWN MANAGER	GEORGETOWN	302 856 7391	gdvornick@georgetowndel.com
Randall B. Inskip	Home Owner	Mallard Lakes	717 578-2743	rbinskip@comcast.net
Ken Flacco	Home Owner	Swann Keys	302-388-6785	
Wenona Phillips	Assistant Director	Laurel Public Library	875-3184	wenona.phillips@lib.de.us
Richard Heesbeck	Home owner	Mallard Lakes	443-235-9301	huntaker@comcast.net
Martha Worthington	Sandy Flood Victim	Mallard Lakes	240 393-1412	m.worthington.RN@gmail.com
Lorraine Johnson	Sandy Victim	Mallard Lakes	302-436-9899	lbj1994@outlook.com
Laila Skofteland	Community Liaison	Keenwick Sound	302-436-9003	laila39@verizon.net
BRIDGET WARNER	SITE MGR ZWAANENDAEL MUSEUM	(DE Historical & Cult Affairs)	302-645-1148	bridget.warner@state.de.us

Page ___ of ___

Annex C

C.2 Public Process

On the following pages are copies of documentation for public involvement during the update process including notice, agendas, sign-in sheets, and presentation materials for the following:

January 29, 2016	Website for All Hazard Mitigation Plan Update Project. Opened Following January Steering Committee Meeting and ongoing throughout the project.
March 10, 2016	Email announcing the meeting with Hazard Mitigation Working Group Meeting
March 11, 2016	Email announcing the County Planning and Zoning Commission Meeting.
March 24, 2016	Sussex County Planning & Zoning Public Meeting
August 2, 2016	Email from Director Thomas announcing the HM Municipal Workshop
August 8, 2016	Sussex County Council Presentation
August 12, 2016	Announcement of September 1, 2016 Public All Hazard Meeting from Website
August 18, 2016	Press Release announcing Sussex County All Hazards Plan Meeting
September 1, 2016	Public Meeting with Mallard Lake Community
September 1, 2016	Public Meeting, Combined Steering Committee and Working Group Meeting
September 6, 2016	Request to Participating Jurisdictions for Plan Review and Comment
September 6, 2016	Notification to Surrounding Jurisdictions of Plan Availability to Review and Comment
September 10, 2016	Plan Update Posted on County Website for Review and Comment
April 5, 2016 thru September 10, 2016	Public Comment Correspondence from Plan Update Project Website
August 10 thru 20, 2016	Municipal Notice Intent to Participate

Begin forwarded message:

From: Joseph Thomas <jthomas@sussexcountyde.gov>
Date: March 10, 2016 at 4:23:49 PM EST
Subject: Next Meeting for Sussex County Multi-Jurisdictional HMP Update

You or a representative of your jurisdiction or agency is invited to attend the next working group meeting regarding the update to the Sussex County Multi-Jurisdictional Hazard Mitigation Plan. The meeting will be held on Thursday, March 24, 2016 at 3:00 PM in the training room at the Sussex County Emergency Operations Center. Attached is an agenda for the meeting.

We are also going to share a map link which shows a preliminary Hazus run. Hazus is a nationally applicable standardized methodology that estimates potential losses from earthquakes, hurricane winds and floods. Hazus uses state-of-the-art Geographic Information Systems (GIS) software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of earthquakes, hurricane winds and floods on populations.

Click on the Hazus Map link: http://arcg.is/1UVsXKt

Username : sussexmaps
Password: Hazu$review

We ask that you take a look at the map and check the data for accuracy, additions, or deletions. Please provide any feedback to me vis email or bring ot with you to the meeting on March 24th.

Thanks,

Joseph (Joe) L. Thomas
Director
Sussex County Emergency Operations Center
21911 Rudder Lane
P.O. Box 589
Georgetown, DE 19947-0589
302-855-7801
302-855-7805 Fax
jthomas@sussexcountyde.gov

Sent from my iPhone

Begin forwarded message:

From: Lawrence Lank <LLANK@sussexcountyde.gov>
Date: March 11, 2016 at 9:35:44 AM EST
To: Jeff Shockley <jcshockley@sussexcountyde.gov>, Joseph Thomas <jthomas@sussexcountyde.gov>
Cc: Janelle Cornwell <janelle.cornwell@sussexcountyde.gov>
Subject: RE: HMP Update

Hi All
Be advised that the Planning and Zoning Commission has agreed to provide time for The Olson Group to make a presentation on the Hazard Mitigation Plan during their meeting on March 24, 2016. The Meeting starts at 6:00 p.m. in Council Chambers. We are scheduling The Olson Group as a Special Business item first, just after the normal approval of the agenda and approval of previous minutes. Since we have scheduled public hearings, old business, and other business we will have to limit the presentation to 10 or 15 minutes, with maybe a few minutes for questions from the Commission.
We are looking forward to the presentation. If The Olson Group has a Power-Point demonstration please contact Janelle Cornwell to set-up.
Lawrence

From: Jeff Shockley
Sent: Thursday, March 10, 2016 4:07 PM
To: Lawrence Lank <LLANK@sussexcountyde.gov>
Cc: Janelle Cornwell <janelle.cornwell@sussexcountyde.gov>
Subject: FW: HMP Update

From: Joseph Thomas
Sent: Thursday, March 10, 2016 3:46 PM
To: Jeff Shockley <jcshockley@sussexcountyde.gov>
Subject: HMP Update

Jeff,

Would it be possible to get our consultant, The Olson Group, on the Planning and Zoning Commission agenda for March 24th to do a 15 overview of the update process for the Hazard Mitigation Plan.

This will also serve as part of the public requirement?

Joe

2 THE CIRCLE I PO BOX 417
GEORGETOWN, DE 19947
(302) 855-7878 T
(302) 854-5079 F
sussexcountyde.gov

Sussex County
Planning & Zoning Commission

AGENDA

March 24, 2016

6:00 P.M.

Call to Order

Approval of Agenda

Approval of Minutes – March 10, 2016

Special Business

Hazard Mitigation Plan Presentation

Old Business

CZ 1759 Osprey Point D, LLC

Application of Osprey Point D, LLC to amend the Comprehensive Zoning Map of Sussex County from an AR-1 Agricultural Residential District to a MR-RPC Medium Density Residential District – Residential Planned Community for a certain parcel of land lying and being in Lewes and Rehoboth Hundred, Sussex County, containing 126.8795 acres, more or less, land lying west of Old Landing Road (Road 274) 1.2 mile south of Warrington Road (Road 275) (911 Address: 20836 Old Landing Road, Rehoboth Beach, DE) (Tax Map I.D. # 3-34-18.00-83.00).
Announcement of receipt of DelDOT comments and applicants response.

C/U #2043 Edward J. Kaye

An Ordinance to amend Condition No. 19 of Conditional Use No. 1431 (Ordinance No. 1530) to allow additional time to complete existing borrow pit operation located on a certain parcel of land lying and being in Seaford Hundred, Sussex County, containing 200.5 acres, more or less. The property is located at the northeast corner of Rd. 531 (Eskridge Rd.) and Rd. 533 (Sandfilippo Rd.). (911 Address: 22223 Eskridge Rd., Seaford). Tax Map I.D. 331-4.00-49.00

C/Z #1798 David and Veronica Hamm/Clarksville Auto

An Ordinance to amend the Comprehensive Zoning Map of Sussex County from an AR-1 (Agricultural Residential District) and a C-1 (General Commercial District) to a CR-1 (Commercial Residential District) for a certain parcel of land lying and being in Baltimore Hundred, Sussex County containing 3.99 acres, more or less. The property is located northeast of Atlantic Ave. (Rt. 26) approximately 300 ft. northeast of the

Clarksville intersection of Omar Rd. (Rt. 54). (911 Address: None Available) Tax Map I.D. 134-11.00-155.00, 153.00, and 83.01

Public Hearings

C/Z #1796 Lockwood Design and Construction Inc., – an Ordinance to amend the Comprehensive Zoning Map of Sussex County from an AR-1 (Agricultural Residential District) to a MR (Medium Density Residential District) for a certain parcel of land lying and being in Lewes and Rehoboth Hundred, Sussex County containing 35.45 acres, more or less. The property is located on the northeast side of Warrington Rd. (Rd. 275), 0.25 mile southeast of John J. Williams Hwy. (Rt. 24). (911 Address: None Available) Tax Map I.D. 334-12.00-127.02, 127.04, 127.05

C/U #2046 Lockwood Design and Construction Inc.,– an Ordinance to grant a Conditional Use of land in a MR (Medium Density Residential District) for multi-family dwelling structures located on a certain parcel of land lying and being in Lewes and Rehoboth Hundred, Sussex County, containing 35.45 acres, more or less. The property is located on the northeast side of Warrington Rd. (Rd. 275) 0.25 mile southeast of John J. Williams Hwy. (Rt. 24). (911 Address: None Available). Tax Map I.D. 334-12.00-127.02, 127.04, 127.05

Other Business

Harbor Point 2013-4
Final Subdivision Plan

Cape Henlopen State Park
Final Site Plan

Bay Forest Club Phases 4 & 5
Final Site Plan

Harbor Point 2013-4 – Amenities
Preliminary Site Plan

Coastal Station
Preliminary Site Plan

Lands of Reyna, Jr on Coon Den Rd.
Minor Subdivision with 50 ft. easement

Lands of Farmer John B. Calhoun Farm, LLC
Minor Subdivision with 50 ft. easement

Lands of George West off West Beach Rd.
Minor Subdivision off 50 ft. easement

Lands of Calvanesa off Dublin Hill Rd.
Minor Subdivision with 50 ft. easement

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Planning and Zoning Commission meetings can be monitored on the internet at www.sussexcountyde.gov.

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In accordance with 29 Del. C. §10004(e)(2), this Agenda was posted on March 17, 2016, 2016, at 8:37 am., and at least seven (7) days in advance of the meeting.

This Agenda is subject to change to include the addition or deletion of items, including Executive Sessions, which arise at the time of the Meeting.

Agenda items listed may be considered out of sequence.

####

2 THE CIRCLE | PO BOX 589
GEORGETOWN, DE 19947
(302) 855-7743 T
(302) 855-7749 F
sussexcountyde.gov

Sussex County Council

AGENDA

AUGUST 9, 2016

10:00 A.M.

**AMENDED ON AUGUST 5, 2016 AT 9:45 A.M.[1]

Call to Order

Approval of Agenda

Approval of Minutes

Reading of Correspondence

Public Comments

Todd Lawson, County Administrator

1. **Wastewater Agreement No. 984-6**
   Sussex County Project No. 81-04
   Coastal Club – Land Bay 4 – Phase 1
   Goslee Creek Planning Area

2. **Possible Introduction of a Proposed Ordinance Relating to Signs**

3. **Proposed Amendment to Ordinance No. 2414 entitled "AN ORDINANCE TO ESTABLISH A MORATORIUM UPON THE ACCEPTANCE OF SPECIAL USE EXCEPTION APPLICATIONS FOR OFF-PREMISES SIGNS"**

4. **Administrator's Report**

Vince Robertson, Assistant County Attorney

1. **Consideration of Annual Comprehensive Plan Report to the Governor's Advisory Council**

Jim Hickin, Director of Airport and Industrial Park Operations

1. **Hangar Lease Assignment – M&C Group, Inc.**

Joe Thomas, Director of Emergency Operations Center

1. **Sussex County Multi-Jurisdictional Hazard Mitigation Plan Update**

Hans Medlarz, County Engineer

1. **Administrative Office Building Chimney & Stair Repairs, Project 16-30**

   A. **Bid Rejection**

** 2. **Runway 4-22 24 Inch Storm Drain Lining**

   A. **Change Order No. 1**

John Ashman, Director of Utility Planning

1. **Proposed Resolution of the Boundary for the Chapel Branch Area of the Sussex County Unified Sanitary Sewer District**

Grant Requests

1. **Chamber of Commerce for Greater Milford for festival and fireworks expenses**
2. **CHEER for Car, Truck & Bike Show fundraiser**
3. **Milton Little League for trip expenses (9/10 All Star Team)**
4. **Nanticoke River Arts Council for general operating expenses**

Introduction of Proposed Zoning Ordinances

Council Members' Comments

Executive Session – Job Applicants' Qualifications, Personnel, Pending Litigation, Land Acquisition pursuant to 29 Del. C. §10004(b)

Possible Action on Executive Session Items

Adjourn

****

Sussex County Council meetings can be monitored on the internet at www.sussexcountyde.gov.

****

In accordance with 29 Del. C. §10004(e)(2), this Agenda was posted on August 2, 2016 at 4:50 p.m., and at least seven (7) days in advance of the meeting.

This Agenda was prepared by the County Administrator and is subject to change to include the addition or deletion of items, including Executive Sessions, which arise at the time of the Meeting.

Agenda items listed may be considered out of sequence.

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[1] **Per 29 Del. C. § 10004 (e) (5) and Attorney General Opinion No. 13-IB02, this agenda was amended to address a matter which arose after the initial posting of the agenda but before the start of the Council meeting.**

Sussex County Multi-Jurisdiction Hazard Mitigation Plan Update
County Council Briefing August 9, 2016

Hazard Mitigation is any action taken to reduce or eliminate long-term risk to people and property from natural hazards.

HMP Update Project: The purpose of this grant-funded project is to update the County's existing Hazard Migration Plan. The project involves stakeholders from the County, each municipality, DEMA and other Delaware agencies, Delaware State University, and the public.

Where we are with the Update:

- 4 of the 7 Plan Sections are completed in draft form and are in the process of final edits before submission to DEMA.
- We are in the process of updating the data found in Sections 4: Risk Assessment, Section 5: Capabilities and Resources and Section 6: Mitigation Strategy with each municipality.
- Currently we are working define and update significant hazards that may impact the County.
    - The Team is working to secure and analyze data related to Hazardous Materials Incidents in the County since the last update.
    - Adding language to discuss the potential risk from coastal zone erosion into the erosion section.
- With the assistance of the County GIS Office, the team is in the process of updating Section 4 Risk Assessment.
- On August 10th and 11th, we will be holding working sessions with all participating municipalities to review material from the previous plan, assess local capabilities to manage hazards and to review potential hazard mitigation projects as warranted to reduce community risk.
- We have taken steps to engage the community in the process. The project has a web presence on the Sussex County EOC website. Residents will be able to review the draft document and provide feedback for discussion within the working group.
- We have held public meetings to include presenting the intent of the update to the County Planning Board. The next public meeting is tentatively scheduled for September 1, 2016 during our Advisory Committee and Working Group meeting.
- The draft Plan will be submitted to DEMA in September and to FEMA for Review and Approval in October.
- We will come back before Council after FEMA Approval for adoption and seek municipal adoption at that time.

UPCOMING MEETINGS

- **September 1, 2016: Public All-Hazard Mitigation Plan Meeting**
  - **Time: 1:30-3:30 pm**
  - **Location: Sussex County Emergency Operations Center**

EMERGENCY OPERATIONS

JOSEPH L. THOMAS
DIRECTOR

(302) 855-7801 T
(302) 855-7805 F

Sussex County
DELAWARE
sussexcountyde.gov
(302) 855-7803 T AFTER HOURS
(302) 855-7800 F AFTER HOURS

Sussex County to host all-hazards plan meeting

Document serves as plan of action to cope in wake of natural, man-made disasters

FOR IMMEDIATE RELEASE

1030 Hours, Thursday
Aug. 18, 2016

The Sussex County Emergency Operations Center invites residents and property owners to attend an upcoming public meeting to offer ideas and comments on a federally required update to the County's All Hazard Multi-Jurisdictional Mitigation Plan.

The meeting will be held from 1:30 to 3:30 p.m. Thursday, Sept. 1, 2016, at the Sussex County EOC, 21911 Rudder Lane, east of Georgetown.

The hazard mitigation plan, first adopted in 2005 and updated in 2010, serves as a comprehensive, long-term planning tool used to identify various strategies local emergency planners would use in the event of a disaster. The overall goal of the effort is to reduce or eliminate the loss of human life and damage to property as a result of hazards, both natural and man-made.

Local jurisdictions must update their plans every five years. As part of that process, the public has the opportunity to review the plan, offer input, and help shape the update. County emergency planners intend to present updated mitigation actions for the plan revision later this fall.

For more information, to view the current plan and future updates, as well as submit comments, visit http://www.sussexcountyde.gov/all-hazard-mitigation-plan. For questions, please contact EOC Director Joseph L. Thomas at (302) 855-7801.

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MALLARD LAKES SUBDIVISION PUBLIC INPUT MEETING AGENDA

9/1/2016 9:00 – 11:00 AM

Mallard Lakes Community Room

1. Welcome and Opening Remarks

2. Hazard Mitigation Plan Update Project Overview and Update

3. Public Review Period and Access to Draft Hazard Mitigation Plan

4. DEMA and FEMA Approval Process

5. Public Comment (limited to 3 minutes per person)

6. Adjourn

MALLARD LAKES 2016 HAZARD MITIGATION PLAN MEETING NOTES

9/1/2016

Date and Location: A Hazard Mitigation Plan (HMP) Update Meeting was held on September 1, 2016 at 9:00 AM at the Mallard Lakes Community Room.

Participants: Mallard Lakes Residents and representatives from the State of Delaware, Sussex County, and Sussex County contractor, Olson Group, LTD.

Purpose: The purpose of the meeting was to provide an overview of the Hazard Mitigation Plan update process plan changes, and next steps. Notes regarding discussion between attendees during the meeting are provided below.

Discussion

County Administrator Todd Lawson opened with a discussion of the purpose of the meeting and an invitation to residents who wish to attend an additional public meeting that at 1:30 at the County Emergency Operations Center to discuss the Plan.

Adam Montella, of the Olson Group Ltd., then provided an introduction of the Hazard Mitigation Plan and, its purpose, and the process through which it was updated.

- Mr. Montella commented on the Uniqueness of communities (25 cities and towns) in Sussex County, Delaware
    - County is also treated as own jurisdiction
    - Cities and Towns have differing capabilities
- Hazard Mitigation Planning and FEMA
    - HMP is a requirement for funding
    - EOP, COOP are required as well for other funding streams
- The role of the community
    - There is a forum online for any and all public comment to be submitted in regards to the current draft of the HMP
- Maintenance and update time
    - The plan will be updated throughout its approval process to include public remarks and further information
- How Unincorporated communities are covered under HMP
    - Local fire companies are first line of defense
    - County emergency management coordinates shelter, evacuation, and training, plus classes, meetings, etc.
- Mr. Montella then introduced the methodology behind the Hazard Mitigation plan
    - Overview of time table and plan conception
    - Scientific look at mitigating disaster
        - Strategies to reduce impact of disaster
- Mr. Montella explained the role of citizens in emergency management

- Emergency management is also the role of citizens
  - County will cover the community regardless, but preparedness starts at home
- Family/community disaster and emergency plans
  - CERT teams to increase local involvement and effectiveness during disasters
    - Community would like CERT plan included in HMP
    - Proposed mitigation strategy that says it will support Mallard Lakes community in private and public funding opportunities in order to create a CERT plan
- Community Plan – First Responders – EOC Plan with FEMA and DEMA supported response

- Difference in assessment periods/coverage
  - What Changes?
    - Mitigation doesn't look at liability, but strategy and prevention
    - Simply allows for grant requests and funding opportunities
      - HMP and CERT helps to achieve "competitive" grants
      - Corporations can also provide money and funding
- 2010 Plan and Mallard Lakes
  - Residents felt there was no mention of unincorporated community in plan
    - Community felt left out
    - Community would like it to be codified that HOAs have emergency management plans
    - Mr. Montella explained that County portions of the Plan included all the unincorporated areas of the County.
      - Joe Thomas, Emergency Operation Coordinator for Sussex County discussed the County's role in response and recovery
        - "Our purpose is to coordinate response and recovery"
        - Pushing out info through media at all times to inform public of impact of disasters and lead to decisions
        - During damage assessment EOC does a public survey to understand the damage in the area.
        - Seasonal homes do not get counted by FEMA, solely primary residents are counted in the federal assessment
- Seasonal versus Year Round Residency
  - Does that effect plan?
    - It can affect grants
    - Anthony Mangeri of the Olson Group Ltd. described the grant process
      - FEMA provides assistance to those with unmet needs
      - Few people get Individual and family grants
        - Most get loans based on capability to repay
      - Must qualify for the grant

        - Hard to receive hazard mitigation grant for seasonal home due to its classification of income property
            - There is no unmet need
    - FEMA does not look to disqualify on percentage of Seasonal vs Full Time, but on basis of unmet/met need
    - SBA loans are also available
- SBA Loans
    - So many of residents of Sussex County are in seconds home
    - Community views SBA as entity for a business, not secondary homes
    - Anthony
        - SBA loans can be used with 25 or more units with significant damage, defined by value of the unit
        - Flood insurance is tool to mitigate water in home
    - Pete Dennen of the Olson Group Ltd. provided further clarification
        - Some of the communities have opted for the adoption of disaster mitigation education programs which would address the misinformation, or lack thereof, regarding other funding sources available
    - Mr. Montella went on to talk about Sussex County's disaster education program
        - Sussex county has a large education program to inform people of appropriate avenues during a disaster

Mr. Lawson then engaged the attendees to address the question "What does this plan mean for you?"

- Mallard Lakes was unsuccessful in receiving grant money after hurricane Sandy
- How can Mallard Lakes ensure preparedness so that the issues of Hurricane Sandy do not repeat themselves?

Mr. Montella began to introduce the document, the information it updates, and what the community can expect from its implementation.

- The current plan captures damages from post-2010 and includes repeated loss figures, as well as estimated growth of communities.

Mr. Mangeri then introduced the pieces of the Hazard Mitigation Plan

- HMP is designed to provide a strategy
    - Plan is not a contract, nor does it obligate anyone to anything
- The University of Delaware was thanked for its role as a partner in operating HAZUS, FEMA's disaster simulation tool.
- Mr. Montella addressed a question from the audience on what FEMA provides after a disaster
    - FEMA rarely provides direct cash contribution in the wake of disasters
        - Their goal is also to return area to pre-existing condition
    - He commented that the cost of not having insurance is far greater than cost of insurance

Role of county in spending the FEMA money

- Mr. Dennen described the Hazard Mitigation Grant process
    - State is grantee, Sussex is sub-grantee
        - Money is spent by community and then reimbursed by FEMA as each phase is completed in a grant
        - If the phases are not completed in accordance to FEMA standards, the community may be liable to return the grant money

Mr. Montella then addressed other questions about the plan from the community

- The community brought up the change in Floodplain level by FEMA over the last few years
    - 2013 – 7 feet, 2015- 4 feet
    - The county appealed the FEMA recommendation and were unsuccessful
    - No units were out of compliance due to the flood level at time of construction decades ago
- The Community felt that the updated plan should review the past goals and their level of completion
- The Community also commented that the permitting process and enforcement of codes should be internally reviewed
- The Community then suggested that financial help should be provided to raise the elevation of homes in the area to be above 7 feet
    - They do not accept the FEMA recommendation of 4 feet
    - Floodplain Maps are updated every 7-8 years
        - This includes changes to floodplain level
- Community feels that building above the floodplain level should be mandatory and included in plan

Mr. Montella then provided closing remarks and, again, invited residents to the working group meeting in Georgetown

- Mr. Montella then invited residents to add comments to the online forum where the document will be posted.
- He closed by stressing that hazard mitigation and emergency preparedness are a community issue

Hazard Mitigation Plan Update Project Points of Contact (POCs)

Sussex County:

Joe Thomas
302-855-7801

The Olson Group, Ltd.

Adam Montella, Project Manager
813-657-5395

Anthony Mangeri, Sr. MPA, CPM, CEM Lead Planner
856-217-9172

Attendee List

The Sign-In Sheet is found on the following page.

Mallard Lakes -Sign In Sheet

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Joe Thomas Sussex County jthomas@sussexcountyde.gov

Sussex County Multi-Jurisdiction Hazard Mitigation Plan Update

Hazard Mitigation is any action taken to reduce or eliminate long-term risk to people and property from natural hazards.

HMP Update Project: The purpose of this grant-funded project is to update the County's existing Hazard Migration Plan. The project involves stakeholders from the County, each municipality, DEMA and other Delaware agencies, University of Delaware, and the public.

Where we are with the Update:

- All Sections of the Plan are completed in draft form for final review by the Hazard Mitigation Steering Committee and Working Group and an open public comment period. One final Appendix will be added after the final meeting, which includes the supporting documentation for the planning process (meeting agendas, sign-in sheets, meeting notes, and presentations). The next step is for Sussex County to Submit for DEMA and FEMA review and approval.

- We have taken steps to engage the community in the process. The project has a web presence on the Sussex County EOC website. Residents are able to review the draft document and provide feedback for discussion within the working group.

- We have held public meetings to include presenting the intent of the update to the County Planning and Zoning Commission.

- The draft Plan will be submitted to DEMA in September and to FEMA for Review and Approval in October.

- We will come back before Council after FEMA Approval for adoption and seek municipal adoption at that time.

HMP Steering Committee, Working Group, and Open Public Combined Planning Meeting Notes

9/1/2016

Date and Location: A Final Planning Meeting for the Hazard Mitigation Plan (HMP) advertised to the public for Steering Committee, Working Group, and open Public Comment on the draft Hazard Mitigation Plan update was held on September 1, 2016 at 1:30 PM at the Sussex County Emergency Operations Center.

Participants: The participants for the meeting included members of the public, representatives from the State of Delaware, Sussex County, Sussex County municipalities, comprising the Steering Committee and Working Group, and representatives from the Sussex County contractor Olson Group LTD, responsible for developing the Hazard Mitigation Plan update.

Purpose: The purpose of the meeting was to provide review the draft Hazard Mitigation Plan (HMP) update with the HMP Steering Committee, Working Group, and members of the public, discuss next steps, and formally begin the public comment period for the Hazard Mitigation Plan update. Discussion and agreements made between meeting attendees during the meeting are provided below.

Overview of Activities

Welcome and Overview: Joseph (Joe) Thomas, Director of the Emergency Operation Center for Sussex County, opened the meeting with an explanation of the Hazard Mitigation Plan and its purpose.

The floor was then turned over to. Anthony Mangeri, of the Olson Group LTD.

- Mr. Mangeri provided an explanation working draft, steering committee, and working group
- Stated the purpose is to make sure the document is on track and public is aware of its contents
- Mr. Mangeri stressed that the Hazard Mitigation Plan is not a contract, no binding in any way
- Community asked who was contacted in regards to document
    - Working groups, county officials, town administrators
    - Community also asked if previously flooded areas were contacted
        - Yes
- An explanation of FEMA's HAZUS software was given
    - The software provides a statistical analysis of disasters and their impact
    - County GIS ran the software

Draft Plan Review: Mr. Mangeri then began a section-by-section presentation of the draft HMP update.

Section I

- Overview of sections and table of contents

- Methodology
  - Identify threats
  - Asses the risks and harms
  - Analyze Current Capabilities
  - Incorporate plans and recommendations
- Appendix A
  - Highlights each municipality which participated in the workshops
    - Jurisdictions will adopt by resolution following FEMA and DEMA approval
- Goals and Objectives
  - Prior goals were assessed to see progress and build on previous iterations of the section
- Participating Communities
  - 4 of 24 did not participate in the HMP
    - Did not attend meetings or working group sessions
    - Blades, Dagsboro, Ellendale, Dewey Beach
- Green areas indicate information that is yet to be attained
  - As information is attained the website will be updated to reflect an accurate draft

Section II

- The planning process
- Lists involved parties in the Mitigation Steering Committee
  - Highlighted the work of UD on the project
  - Olson group team is also listed
- Data Collection
  - Highlighted critical facilities
    - CF being fire companies, police stations, medical facilities, etc
- Hazard Mitigation Working Group List
- List of meetings
- Process
  - Public involvement, other interested parties
- Floodplain Administrator list
  - Also contains Municipal Points of Contact
- Federal Documents and Data Utilized
  - Why it was used
  - How it was used
- Delaware State Hazard Mitigation Plan and Counties

Section III: Hazard Identification

- Examined various types of Hazards and their history
  - Ranked based upon risk, concern, and history
    - If there was no historical ranked data (I.e. Volcanoes) no ranking was given

- Narrative discussion of risks and data consulted
  - The information contained in the draft Plan update is current as of the end of 2015 as of 2015
  - The information contains data regarding the identified hazards such as wind events, lightning strikes, hurricane, extreme heat, winter storms etc.
  - Nor-Easters comprise their own category separate from hurricanes
  - The information is localized for Delaware and combined with other national information.
- CPRI
  - Each box has a 0-5 value based on historical frequencies, duration, and damage
  - These values are added to a formula and calculated to produce a ranking, which is then presented to the steering committee.
- Mercalli Scale for Earthquake
  - Calculates the severity of a quake and their potential
- Wildfires
  - The definition of a wildfire is fairly lenient
    - Instances listed include approximated size and impact
- Coastal Erosion
  - Is not currently a major issue, but has been brought to the attention of the public so that a discussion can be started on solution and mitigation
- Dam Failure
  - There is a difference in information between national and state level data
    - Public input is being sought to rectify that section
  - May be a discrepancy between public and private dams
- Terrorism
  - Terrorist activity is included in order to encourage preparedness
  - The threat of terrorism is viewed as fluid, and as such should be prepared for.
- Pipeline
  - The Working Group requested a look into gas pipelines
    - Most pipelines are new and built to higher current standards
- Probability/ Magnitude Tables and Ranking
  - Explains the methodology behind the ranking of disasters
  - Floods, Thunderstorm, and Hurricanes topped the list

Section IV: Hazard Vulnerability

- What will each hazard effect?
  - This includes building stock and population
- HAZUS
  - This section includes a discussion on the methodology, science, and calculations behind the HAZUS program
  - HAZUS takes into account the cascading effects of critical facility damages and loss during disasters
  - Includes what has been lost, and a projection of what could be lost

- Census data
  - The data found in the US Census is based on the Census blocks depicted in a graphic found in this section
- The community is concerned as to whether part-time residents are included in the plan
  - The data regarding seasonal population is incorporated, when available, in Appendix A
- Loss Data
  - Loss data is based on historical record
  - The narrative works to explain the significance of HAZUS results
- Summary Sections
  - Includes every incorporated community and the county
    - Tables the results of expected loss for the varying disasters analyzed through the HAZUS simulation
- Unique Risks
  - Bethany Beach, Ellendale, and other coastal communities inquired about beach erosion, however beach erosion is not considered in a Hazard Mitigation Plan.

Section V: Capabilities Assessment

- Assessment were conducted at the local level with officials and community members
- Assessment inquired as to whether jurisdictions had emergency operations plans, zoning plans, regional plans, hazmat plans, and other precautions to prepare for certain risks
    - This section also includes a narrative discussion of these plans
  - More jurisdictions are doing more about risk management and risk reduction in their community
    - These plans show FEMA continuity and increased efforts towards attaining funding
- Rating scale of department efficiency by jurisdiction
  - Also includes a rating of fire departments
    - Leads to a "grade" and influences insurance costs
- NFIP Involvement
  - The document looked at participants and whether they were a member of the NFIP
  - 3/16/2015 provided updated FEMA information of flood plain
- Communities Rating System
  - 7 communities are involved
    - Leads to a 5-6% discount on insurance
  - More participation in community leads to a discount in flood insurance
- Self-Assessment
  - The HMP asked jurisdictions to review their own capabilities
    - This was a subjective study
  - County believes it has more financial resources than past years
- Recommendations
  - Modified to remain in line with 2010, yet provide an update

- Conclusion on Local Capability
    - County is going through a period of sustained growth. This growth proves difficult to measure due to seasonal residents

Section VI: Mitigation Strategy

- HMP seeks to target the reduction of inventory of NFIP

Section VII: Plan Monitoring and Maintenance

- As soon as first entity adopts the plan, the 5-year cycle restarts
- Section also includes a recommendation for the methodology used in the prior sections
    - Allows for the continual update and improvement to information and strategy

Annex A:

- Focuses on individual counties, their capabilities, and Mitigation Actions
    - Mitigation Actions are goals, not commitments

The community expressed concern as to the inclusion of unincorporated area and the difference between sections of the county (i.e., agricultural versus resort areas)
Joe Thomas responded by stating:

- Community is asked to report damages in private areas
- The county cannot enter and survey damage on a private land

The community expressed concerned as to the accuracy of public reporting and request codification from the state level in order to better analyze damages during disasters
The community is also concerned as to the level at which preparedness is discussed in the document. They do not feel they are informed as to the process of evacuation, nor where to go in such an instance.

- The community sites unincorporated areas as a concern, stating that the County does not have the ability to fully represent them and provide for them fiscally
    - Administrator Todd Lawson addressed the audience and opened a dialog
        - Acknowledges the lack of communication unincorporated communities have and urged community members to become more involved in emergency management activities, training, and other educational opportunities
- The community also expressed concern over the identification of shelter and the timeframe in which they are identified
    - Joe Thomas and Todd Lawson addressed this issue
        - This issue with a pre-designated shelter is that it does not account for roads being rendered unusable or other circumstances preventing the use of a particular shelter during a disaster.
        - While there is a list of designated shelters, the type, size, and scope of the emergency dictates the shelters that are ultimately opened during the emergency
- The community would like to include more unincorporated areas to attain their personal input and representation in the plan
- The community also request that people be considered more, not just property

Next Steps: Adam Montella from OGL explained the draft plan would be posted on the Hazard Mitigation section of the County website for public comment until Friday, September 9. Mr. Thomas will also be emailing the draft HMP update t the Steering Committee, Working Group, and Neighboring counties for review and comment. OGL will finalize the draft plan from the comments received, then Sussex County will submit to the Delaware Emergency Management Agency (DEMA) and the Federal Emergency Management Agency (FEMA) for review and pending approval. With "Approval Pending Adoption" the County and municipalities will adopt by resolution, beginning the next five-year update cycle.

Outstanding Actions

The following actions remain:

- OGL to send out notes from this meeting.
- Sussex County to post notes and draft HMP update to the County website for review and comment. Comments due by September 9.
- Sussex County to send a copy of the draft HMP to the HMP Steering Committee, Working Group, and neighboring counties for review and comment. Comments due by September 9.
- OGL to make final plan changes and Submit to Sussex County Emergency Operations Center by September 13.
- Sussex County to submit HMP Update to DEMA and FEMA for review and approval by September 16.
- Modifications based on DEMA and FEMA review and formal adoption, dates TBD.

Hazard Mitigation Plan Update Project Points of Contact (POCs)

Sussex County:

Joe Thomas
302-855-7801

The Olson Group, Ltd.

Adam Montella, Project Manager
813-657-5395

Anthony Mangeri, Sr. MPA, CPM, CEM Lead Planner
856-217-9172

Attendee List

The Sign-In Sheet for the meeting is attached.

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update
Steering Committee/Working Group Draft Plan Meeting
September 1, 2016

SIGN-IN SHEET

Name	Title	Organization	Phone	Email
DAVID WILSON				
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CHARLOTTE FRYE	HOMEOWNER	Bethany HOA	"	"
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Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update
Steering Committee/Working Group Draft Plan Meeting
September 1, 2016

SIGN-IN SHEET

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Page ___ of ___

Sussex County Delaware 2016 Multi-Jurisdictional Hazard Mitigation Plan Update
Steering Committee/Working Group Draft Plan Meeting
September 1, 2016

SIGN-IN SHEET

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MARIA COUNTS (MEDIA)		COASTAL POINT	302.539.1788	MARIA.COUNTS@COASTALPOINT.COM
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Ken Flacco	Home Owner	Swann Keys	302-388-6755	
Wenona Phillips	Assistant Director	Laurel Public Library	875-3184	wenona.phillips@lib.de.us
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Martha Worthington	Sandy Flood Victim	Mallard Lakes	240 393-1412	mworthington.RN@
Lorraine Johnson	Sandy Victim	Mallard Lakes	302-436-9899	lbj19944@outlook.com
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BRIDGET WARNER	SITE MGR ZWAANENDAEL MUSEUM	(DE Historical Cult Affairs)	302-645-1148	bridget.warner@state.de.us

Page ___ of ___

From:	Joseph Thomas
To:	Adam Michael Montella; Anthony S. Mangeri
Subject:	FW: Final Draft Sussex County Multi-Jurisdictional All Hazard Mitigation Plan Update
Date:	Tuesday, September 6, 2016 10:41:46 AM
Attachments:	Final Draft Sussex County HMP Update 09012016_pd.pdf
Importance:	High

Sent this to Working Group and all Local Jurisdictions.

From: Joseph Thomas
Sent: Tuesday, September 06, 2016 10:38 AM
Subject: Final Draft Sussex County Multi-Jurisdictional All Hazard Mitigation Plan Update
Importance: High

First, my apologies for the some of you not being able to get into the meeting on Thursday, September 1st for the presentation of the final draft of the hazard mitigation plan. We did not anticipate we would have that many people from the public attend the meeting.

With that, some of you did not get to see the information presented so we are sending you the final draft in PDF format for your review and comment. I respectfully request a quick turnaround in your review as we need to submit to DEMA and FEMA for review. The final draft has also been posted on the County's website at www.sussexcountyde.gov/all-hazard-mitigation-plan.

I am requesting your comments back no later than close of business Friday, September 9th.

Thank you for your participation in the update process, the fact that 20 of 24 incorporated jurisdictions have provided input is great and shows our continued strong working relationship.

Joe

Joseph (Joe) L. Thomas
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jthomas@sussexcountyde.gov

From: Joseph Thomas
Sent: Tuesday, September 06, 2016 10:57 AM
To: Ebling, Bryan (Caroline County, MD); Faulkner, Colin (Kent County, DE); Garvin, Stevin (Dorchester County, MD); Rhode, Robert (Ocean City, MD); Shipley, Dave (Wicomico County, MD); Webster, Fred (Worcester, MD)
Subject: Final Draft Sussex County Multi-Jurisdictional All Hazard Mitigation Plan Update

Sussex County is in the process of its required update to our All Hazard Mitigation Plan. We contracted a consultant to update the plan and they have suggested that we share the final draft with all our surrounding counties, including Maryland, for your review and comment if you desire. This is a necessary outreach effort that is looked on favorably by FEMA.

With that, we are sending you the final draft in PDF format for your review and comment. I respectfully request a quick turnaround in your review as we need to submit to DEMA and FEMA for review. The final draft has also been posted on the Sussex County website at www.sussexcountyde.gov/all-hazard-mitigation-plan.

I am requesting comments back no later than close of business Friday, September 9th.

Thank you,
Joe

Joseph (Joe) L. Thomas
Director
Sussex County Emergency Operations Center
21911 Rudder Lane
P.O. Box 589
Georgetown, DE 19947-0589
302-855-7801
302-855-7805 Fax
jthomas@sussexcountyde.gov

All Hazard Mitigation Plan

Current Plan

All Hazard Mitigation Plan (PDF, 7.25MB)

Sussex County Hazard Mitigation Plan Update Project

The Sussex County Multi-Jurisdictional Hazard Mitigation Plan, first adopted in 2005, is part of the County's all-hazards plan that serves as a comprehensive, long-term planning tool used to identify various strategies. The overall goal of the effort is to reduce or eliminate the loss of human life and damage to property as a result of hazards, both natural and man-made. The Disaster Mitigation Act, passed in 2000, requires states and local governments to develop and approve hazard mitigation plans in order to be eligible for post-disaster hazard mitigation funding.

Every five years, as is required by FEMA, we have to update our plan. The update will consist of discussing timelines for implementation of mitigation actions, as well as describe specific expectations and roles for state, county and local officials. The County has selected a consultant, The Olson Group, Ltd., to update the current plan. Part of the update process requires public notification and participation which is why we are using this as one of the forums to gain comments from the public. We have also added a form to allow anyone to submit comments which will be incorporated in the plan.

Submit Comments

- Upcoming Meeting Schedule
- Project Kickoff Meeting Minutes
- Notional Timeline and Task List
- Initial Planning Meeting and Project Overview Presentation
- Steering Committee Coordination Meeting Agenda
- Steering Committee Coordination Meeting Minutes
- Steering Committee Initial Planning Meeting Agenda
- Steering Committee Initial Planning Meeting Minutes
- Working Group Initial Planning Meeting Agenda
- Working Group Initial Planning Meeting Minutes
- Combined Steering Committee/Working Group Meeting Agenda - 3/24/2016
- Combined Steering Committee/Working Group Meeting Minutes - 3/24/2016
- News Release for Public Meeting - 9/1/16
- Mallard Lakes Meeting Notes - 9/1/2016
- Final Planning and Public Comment Meeting Notes - 9/1/2016
- Final Draft

Submitted by: Melissa Golden

Email address: goldencomm@comcast.net

Phone number: 717.881.2482

Feedback submitted:
Perhaps the most significant challenge is Mallard Lakes. Since ML has unremediated substantially damaged (from Sandy) buildings that are BFE, this means Sussex County is non-compliant with NFIP. Sussex did apply for a Hazard Mitigation grant for ML that was denied by FEMA.

Where is Mallard Lakes ranked as to Hazard Mitigation priority? What is being done? We have 24 unit owners: elderly, families with small children...all in danger of future flooding living in condo units that Sussex says they will not grant certificates of occupancy.

Sandy victims would like to know your plans with regards to mitigating the very serious issues in Mallard Lakes that affect NFIP compliance for all of Sussex County.

Thank you for the opportunity for feedback.

Submitted on Friday, April 29, 2016 - 9:06pm

Submitted by: Melissa Golden

Email address: goldencomm@comcast.net

Phone number: 717.881.2482

Feedback submitted:
Perhaps the most significant challenge is Mallard Lakes. Since ML has unremediated substantially damaged (from Sandy) buildings that are BFE, this means Sussex County is non-compliant with NFIP. Sussex did apply for a Hazard Mitigation grant for ML that was denied by FEMA.

Where is Mallard Lakes ranked as to Hazard Mitigation priority? What is being done? We have 24 unit owners: elderly, families with small children...all in danger of future flooding living in condo units that Sussex says they will not grant certificates of occupancy.

Sandy victims would like to know your plans with regards to mitigating the very serious issues in Mallard Lakes that affect NFIP compliance for all of Sussex County.

Thank you for the opportunity for feedback.

Submitted on Friday, April 29, 2016 - 9:36pm

Submitted by: Melissa Golden

Email address: goldencomm@comcast.net

Phone number: 717.881.2482

Feedback submitted:
Please develop DE legislation to require HOAs to have an emergency management plan on file with mandatory reporting of disaster within 24 hours. With so many HOAs in DE, oversight of these small businesses is necessary so DE does not become a state of separate fiefdoms. In Mallard Lakes, Sandy damages of millions of dollars were not reported by the HOA to officials or included is state damage figures for federal disaster funds.

Submitted on Friday, April 29, 2016 - 10:04pm

Submitted by: Ronald Arters

Email address: ronart1@verizon.net

Phone number: 302-530-8070

Feedback submitted:
I own a condo at Mallard Lakes on Route 54 that was flooded by Hurricane Sandy.
Sussex County removed the Certificate of Occupancy from my building until it is elevated, which Mallard Lakes Condo Association refuses to do. As a consequence I am legally unable to sell, rent or live in my unit, although Sussex County allows me to continue to use it. Thus, I have a condo that is in a hazard zone with no one either elevating my building or offering a buyout. There are 23 other owners in the same fix. Needless to say we could use a little Hazard Mitigation Planning.

Submitted on Friday, April 29, 2016 - 10:14pm

Submitted by: Karen and Terry Wiles

Email address: karenwiles@comcast.net

Phone number: 301-332-6610

Feedback submitted:
What is being done about the flood hazard in the Mallard Lakes Community in Sussex County? Townhouses were substantially damaged by superstorm Sandy over
3 years ago and are required to be elevated.

Submitted on Saturday, April 30, 2016 - 7:28am

Submitted by: Harry & Judith Hawkins

Email address: jhbh100@comcast.net

Phone number: 3024364680

Feedback submitted:
Where does Mallard Lakes rank as a flood hazard, and what are you doing to mitigate the flood hazard at Mallard Lakes.

Submitted on Saturday, April 30, 2016 - 7:43am

Submitted by: Audrey Morse

Email address: ammorse@comcast.net

Phone number: 410 3753744

Feedback submitted:
I would like to know what the plan is for Mallard Lakes. This community has already been flooded and at the present time 24 units do not have occupancy permits. Thanks Audrey Morse

Submitted on Monday, May 2, 2016 - 4:20pm

Submitted by: Helen Fiori

Email address: hefiori@debevoise.com

Phone number: 202-383-8004

Feedback submitted:
Can you tell me where Mallard Lakes ranks as a flood hazard? What is the county doing to mitigate the flood hazard at Mallard Lakes where there are substantially damaged buildings that have not been elevated. Thank you.

Submitted on Monday, May 2, 2016 - 7:34pm

Submitted by: Jerry Clunan

Email address: jerry@myfinancialplanner.com

Phone number: 717-471-7928

Feedback submitted:
I am curious as to what is being done with the out of control situation at Mallard Lakes in Selbyville DE It would appear that the homeowners association blames Sussex Co for many things.
My observation is that the association has made some terrible if not fraudulent decisions.
jc

Submitted on Wednesday, May 4, 2016 - 7:55am

Submitted by: Lorraine B. Johnson

Email address: lbj19944@outlook.com

Phone number: 302-436-9899

Feedback submitted:
I am one of 21 full time residents at Mallard Lakes located on Route 54. I am in an area known as "the island" part of the community Mallard Lakes. We were flooded October 29, 2012. Our homes were rebuilt, but not according to FEMA code. Four buildings on "the island" were designated Substantially Damaged by FEMA and Sussex County officials as a result of Super
Storm/Hurricane Sandy. Yet the four buildings rebuilt are still below the
FEMA flood plain because they were never elevated prior to the restoration.

NFIP coverage for all of Sussex County is based on providing information that Mallard Lakes has 4 buildings identified by Sussex officials as a repetition loss, substantially damaged from Sandy and below flood plain.

There have been NO mitigation efforts by the Mallard Lakes HOA for these buildings and 24 unit owners remain extremely vulnerable to the devastation of future flooding. The vulnerability of this area needs to be ranked high, if not the #1 in the plan and a mitigation plan included as well.

We are at a loss with what to do, as we have reached out to any and all agencies we think may be viable options.

Submitted on Wednesday, May 4, 2016 - 3:29pm

Submitted by: martha worthington

Email address: mworthington.RN@hotmail.com

Phone number: 240-393-1412

Feedback submitted:
NFIP coverage for all of Sussex County is based on providing information that Mallard Lakes (Selbyville) has 4 buildings identified by Sussex officials as a repetition loss, substantially damaged from Sandy and below flood plane.

There have been no mitigation efforts by the HOA for these buildings and 24 unit owners remain vulnerable to the devastation of future flooding. The units are occupied WITHOUT CO's!!!!

The vulnerability of this area needs to be #1 priority in the plan and a mitigation plan developed as well.

Martha & John Worthington

Submitted on Wednesday, July 27, 2016 - 11:52am

Submitted by: Melissa Golden

Email address: goldencomm@comcast.net

Phone number: 717-881-2482

Feedback submitted:
Mallard Lakes condo unit owners have asked to be made aware of opportunities for testimony and for updates on the hazard mitigation plans for Sandy victims, determined to be repetitive hazards, substantially damaged, who remain BFE - and risk the devastating effects of future flooding without hazard mitigation.

We have made numerous contacts with Sussex Emergency Management manager who we understand is in charge of this project, but have not had a response.
Numerous unit owners have made public comment in this provided feedback forum. Could someone please update us?

Thank you so much.

Thank you. We look forward to additional updates and the next public meeting on September 1, 2016.

Submitted on Monday, August 15, 2016 - 1:13pm

Submitted by: Melissa Golden

Email address: goldencomm@comcast.net

Phone number: 717-881-2482

Feedback submitted:
Thank you for the update as recorded at the August 9, 2016 Sussex County Council Meeting.
It was interesting the hear the question on FEMA response in the audio provided from the August 9, 2016 Sussex County council Meeting. The question of response time is a key element to consider with regards to HOAs, which are not municipalities, yet need to comply with all level of government regulations - as would any small business.

At Mallard Lakes, an incorporated Common Interest Community, it seems the devastation from Sandy was not reported, building permits taken out by the HOA and contractor did not describe the extent of devastation so improper permits were issued. There is no record of any county inspections and condemnation of the property as ulnivable while remedation was in progress, there are no inspections of workmanship to insure the units are livable and comply with county codes. there are no certificate of occupancy that the homes are livable. Livability would seem to include 1. elevation as well as 2. inspection for building code compliance.
Would it be a hazard that buildngs were not inspected?

Due the lack of immediate reported response and correct information, it seems the proper procedures were not followed by numerous parties and in numerous way.. Could you please let us know the accountability or enforcement regarding this?
Any type of regulation, codes or other mandates would seem ineffective without enforcement and accountibility for violations.

Mallard Lakes remains BFE without elevation and in danger of the devastation of future flooding as documented by DE legislator and Governor, Sussex grant application "the area will flood again" and Brad Whaley's powerpoint presentation that if the units had been above flood plain, Sandy would not have had such an effect.

These units are wood frame, on pilings with families, elderly and others living in them full time - unpermitted, uninspected and without CoOs.
Yet, with recent February flooding, knowing that there was previous flooding
- the most destructive in Sussex County - to my knowledge, no one from Sussex County EMO came to Mallard Lakes to evacuate and check on damage.
Could we please have an answer to this?

We want to be sure the safety of Mallard Lakes residents is a high priority for Sussex County as we go through the Hazard Mitigation process.

Submitted on Monday, August 15, 2016 - 5:01pm

Submitted by: Lori Johnson

Email address: lbj19944@outlook.com

Phone number: 3024369899

Feedback submitted:
After almost 4 years after Hurricane Sandy's class three contaminated water,
24 homes remain without Certificates of Occupancy, as they were never inspected. Permits were given to the Mallard Lakes HOA and Lincoln Hancock Restoration "site unseen". The properties do not meet FEMA guidelines, no structural inspection, electrical inspections, plumbing inspections, and hygienic readings have been completed.

The homeowners were lead to believe we were safe to return home. What are the consequences of Mallard Lakes HOA and Lincoln Hancocks failure to do their fiduciary duty? How long is the county and and state governments going to "wait and see" what Mallard Lakes HOA is going to do to resolve the issues. Being told by the Mallard Lakes Treasure to "sell our homes for a dollar, someone will buy it", only prolongs the inevitable. These are our homes. Where we lay our heads at night and put our children to bed.

Thank you,
Lori Johnson

Submitted on Friday, August 19, 2016 - 2:53am

Submitted by: Richard Heubeck

Email address: huntatsea@comcast.net

Phone number: 443-235-9500

Feedback submitted:
I am a year-round resident at Mallard Lakes. I have lived there for over 25 years. I was substantially damaged by super storm Sandy. From what I understand the flood base line went from 4' before Sandy to 7' after Sandy..
This is a good thing since no one should have to live on or below the flood base line. Then FEMA lowered it back to 4' for a reason we the residents who lived through Sandy were not told. As a governing board for Sussex County, Ii look to you to keep us out of harms way. With the base line back to 4', we now live with the continuous threat of flooding with the forecast of every nor'easter. Everyone of us, 30 homeowners who are on the "Island" live exactly at 4' of below it. Put yourselves is our situation. Allowing the flood base line to remain at 4' is ":penny wise, but pound foolish". We will flood again. That is a certainty, we just don't know when. The next occurrence of substantial damage is preventable if the flood base line goes back too 7'. You have government officials, state and nationally, who have offered their support. Please ask for their assistance. Don't let the next storm be the one with regrets that "we could have done something more."

Submitted on Friday, August 19, 2016 - 9:28am

Submitted by: Judy & Bailey Hawkins / Mallard Lakes

Email address: jhbh100@comcast.net

Phone number: 302 436 4680

Feedback submitted:
Owners for 29 years, of our unit in Mallard Lakes, Selbyville Delaware. Over the past 29 years we have seen many, extremely high tides and flooding from Nor-East Storms that have come within inches of flooding into our unit. As the sea level has risen we are no longer safe with the couple of inches that has saved us in the past. That was proven with Super Storm Sandy. Will another Super Storm repeat the flooding or even a worse disaster in our Community and other Coastal Communities nearby in Sussex County, YES.
The lack of immediate response and correct information as well as proper permits were not done for Super Storm Sandy residents of Mallard Lakes.
Improper procedures were followed therefore unit owners still 4 years later are still in jeopardy of flooding and have no occupancy permits. Even those unit owners in building 24, like myself, cannot obtain a proper occupancy permit from the County even though we were told we have one.
Lets put a plan into effect that will protect homeowners from these mistakes happening again.

Submitted on Friday, August 19, 2016 - 10:24am

Submitted by: Helen Fiori

Email address: hefiori@debevoise.com

Phone number: 202-383-8004

Feedback submitted:
I have been an owner at Mallard Lakes for almost 30 years now and I was a victim of Hurricane Sandy. I know you have heard from others about the situation at ML, so I will not repeat the issues. I hope that you can somehow help us get our houses elevated so that we don't lose them. This is a very serious situation. Thank you.

Submitted on Friday, August 19, 2016 - 1:54pm

Submitted by: martha worthington

Email address: mworthington.rn@hotmail.com

Phone number: 240-393-1412

Feedback submitted:
As a taxpaying citizen of Sussex County and homeowner of Mallard Lakes, I am appalled that after nearly 4 years since Super Storm Sandy flooded our homes we still do not have Certificate of Occupancies and the repairs to make this possible has stopped. Is the Council so incentive to not realize the financial, health and safety impact this has on us? What are your plans?

I have been a Registered Nurse for over 30 years and if I ever treated one of my patients in the manner in which we have been treated I would have been fired and lost my license to practice.

We CANNOT sell our homes. We had Class III water in our homes, incorrect permits were pulled by Lincoln Hancock Restoration, we had NO say in the repairs, the floors were NOT replaced, my porch windows will NOT open because they were not replaced, moisture tests were high indicating probable mold and on & on....It has been a living nightmare. Mallard Lakes HOA has turned their backs on us. We have retained an attorney to represent us. Why is this necessary?

I purchased my home in 1988 and always paid my taxes and HOA dues. Now, that I am close to retirement I would like to be able to retire and enjoy my home.
Unfortunately, this will not be possible, instead my husband & I purchased another home in Sussex County because living at Mallard Lakes was too stressful and becoming a health issue. We both had increased blood pressures and anxiety in which the doctor has attributed to stress. Once we moved our stress levels improved, but we still have a financial burden that we CANNOT sell!

Not only is living at Mallard Lakes a health issues it is a major SAFETY issue. Our homes have not been inspected, are they safe? Will there be problems with our health in the future because of probable mold?

Where has the Council been? Why is Mallard Lakes HOA and Sussex County allowed to treat us this way?
When will we have closure and resolution?

Martha Worthington

the enforcement of inspection protocols all affect the level of hazard rish faced by a community." Malllard Lakes had incorrect permitting, has had no building code inspections, lack of enforcement of building codes - which leaves residents in flood prone, hazardous condition.

4. A good point was made about unincorporated sections of Sussex County (particularly in the back bay areas) which frequently flood - Slaughter Beach, Broadkill, Mallard Lakes, etc. When this information is added to other Sussex info, it does not appear as if flooding is a concern Yet, the Back Bay areas flooded during Sandy as well as during the Feb. 2016 nor'easter so it should benoted as a flood hazard as well as coastal areas - especially since much of this area is in the 100 year flood plain

5. Sussex has chosen not to have Freeboard, while other municipalities have adopted a freeboard. That means that frequently flooded areas have new construciton with no freeboard. Can there be a new code that has a freeboard that is consistent with other coastal.amd back bay municipalities? Currently,
with new construction, builders are filling in up to 4 feet, then building on slab, What is the affect of raising the ground level have on other existing developments? Are there plans for water drainage affects on other developments?

6. Recommend there be code that Condo boards and HOAs be required to have Hazard Mitigation plans filed with the Sussex County EOC and that any emergency in be reported to proper authorities within 24 hours. A big problem with the Mallard Lakes Sandy devastation seems to be the lack of reporting. This could have affected the emergency management response,the lack of condemnation of the affected units until proper permits, repairs and inspections were completed, the amount of damages reported for Delaware, affected the Governor's disaster declaration, affected the disaster relief aid for Delaware, etc.
This is another example that incorrect Data in, leads to incorrect Data out and incorrect conclusions.

Thank you for making this part of the public record on this very important issue.

Respectfully submitted September 5, 2016 Melissa Golden Mallard Lakes Condo Unit Owner

Submitted on Monday, September 5, 2016 - 9:48pm

Submitted by: Melissa Golden

Email address: goldencomm@comcast.net

Phone number: 717-881-2482

Feedback submitted:
Thank you for the special meeting at Mallard Lakes and the opportunity for feedback at this meeting. At the next meeting, the draft plan was presented and the below are comments to be entered into the public record.

1. Incorrect data going in could yield incorrect output and incorrect conclusions and decisions.

a. The NFIP report referenced in the Hazard Mitigation plan incorrectly reports that Sussex County is in compliance. This is incorrect as there are substantially damaged buildings in Mallard Lakes that are not included in the report. A reporter mentioned Mallard Lakes when the report was issued in March 2015 and it was stated that Sussex is working on a common sense conclusion with residents. It has been over a year since the report and there has been no solution.
The NFIP report must therefore be corrected - does an amended report need to be filed? The existing report cannot be used as it is incorrect and leads to an incorrect conclusion.
Please note that Sussex County determined 4 buildings were substantially damaged. This substantial damaged information was used as evidence for a FEMA increased cost of compliance claim as well as for a FEMA hazard Mitigation Grant applications.
Since the 4 substantial damaged buildings are in the 100 year flood plain and below 4 foot elevation, Sussex codes require they be elevated.

b. We are unsure what value was reported for flood damages at Mallard Lakes.
Can you please verify with Emergency Management when damage was reported by ML and how much was reported? by ML In the September 2013 minutes published on the Mallard Lakes Website, it stated, "Property Management – Donna
Hemphill • Donna presented a flood claim breakdown. The total claim
was $1,804,092.34"
There has also been an Increased Cost of Compliance claim filed for
$120,000.($30,000 for each substantially damaged building) The buildings are also required to be elevated according to code, costing approximately $1.2 milllion and extensive repairs are required tot he flooring, estimated to be
over $100,000. So, it seems Sandy flood damages at Mallard Lakes could be
$4 million.

3. We remain concerned as was stated at the Mallard Lakes meeting that there needs to be accountability for following the Hazard Mitigation plan during Sandy. Specifically, Section 5, Page 11 states, "Decision regarding the adoption of building codes (that account for hazard risk) the type of permitted process required both before and after a disaster and

From: Joseph Thomas
Sent: Tuesday, September 06, 2016 10:38 AM
Subject: Final Draft Sussex County Multi-Jurisdictional All Hazard Mitigation Plan Update
Importance: High

First, my apologies for the some of you not being able to get into the meeting on Thursday, September 1st for the presentation of the final draft of the hazard mitigation plan. We did not anticipate we would have that many people from the public attend the meeting.

With that, some of you did not get to see the information presented so we are sending you the final draft in PDF format for your review and comment. I respectfully request a quick turnaround in your review as we need to submit to DEMA and FEMA for review. The final draft has also been posted on the County's website at www.sussexcountyde.gov/all-hazard-mitigation-plan.

I am requesting your comments back no later than close of business Friday, September 9th.

Thank you for your participation in the update process, the fact that 20 of 24 incorporated jurisdictions have provided input is great and shows our continued strong working relationship.

Joe

Joseph (Joe) L. Thomas
Director
Sussex County Emergency Operations Center
21911 Rudder Lane
P.O. Box 589
Georgetown, DE 19947-0589
302-855-7801
302-855-7805 Fax
jthomas@sussexcountyde.gov

Submitted on Saturday, September 10, 2016 - 7:19am

Submitted by: Fran Lazerow

Email address: flazerow@aol.com

Phone number: 302 436 3696

Feedback submitted:
The Southern Sussex County Community Action Group (SSCCAG) appreciates the opportunity we were given to attend the Sussex County Hazard Mitigation Plan meeting on September 1, 2016. As follow up we want to bring to your attention 3 key concerns of the unincorporated communities along Rtes 54 and 20.

1. Population issues

The Plan as drafted does not have a complete estimate of current and projected growth of population especially in southern Sussex County. This needs to be explicitly addressed in risk assessment. Many homeowners in this area sustained significant expensive damage during Hurricane Sandy and other storms; these were not included in the data base.

2. Proper risk assessment of sea level rise projections

Sea level rise has not been included as a risk factor in the Plan draft.
Over the 10 year life of this Plan it is projected that several Sussex County areas will see increased flood risks due to this factor.

3. Inadequate representation of residents of unincorporated areas

There is no representative of the unincorporated areas in the working group or the decision process. The Consultants should meet with leaders in these communities, which account for a very substantial part of the County's population.

Thank you

Fran Lazerow
Chair
The Southern Sussex County Community Action Group

Annex C

C.3 Correspondence

On the following pages are copies of correspondence related to the development of the plan update:

January 7, 2016	Letter from Joseph L. Thomas, Director of Emergency Operations Requesting an extension to complete the Update to the Sussex County Multi-Jurisdictional Hazard Mitigation Plan.
August 2, 2016	Email request to jurisdictions for Intent to Participate documentation
August 2, 2016	Email requesting workshop participation
September 6, 2016	Email to Municipalities to advise of the Final Draft Sussex County Multi- Jurisdictional All Hazard Mitigation Plan Update Review
September 6, 2016	Email from Director J. Thomas to Adjoining Counties

JOSEPH L. THOMAS
DIRECTOR OF EMERGENCY OPERATIONS
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jthomas@sussexcountyde.gov

Sussex County
DELAWARE
sussexcountyde.gov
(302) 855-7803 T AFTER HOURS
(302) 855-7800 F AFTER HOURS

January 7, 2016

Hazard Mitigation Grant Program, Disaster FEMA-DR-4090-DE

A.J. Schall, Jr.
Delaware Emergency Management Agency
165 Brick Store Landing Road
Smyrna, DE 19977

Dear Mr. Schall,

The Sussex County EMA would like to request an extension on Hazard Mitigation Grant Program (HMGP), Disaster FEMA-DR-4090-DE. The extension is needed to complete the update to the Sussex County Multi-Jurisdictional Hazard Mitigation Plan.

Sussex EMA has contracted with The Olson Group, Ltd. to update the Hazard Mitigation Plan. The extension is needed because the County's Attorney and Finance Department has been modifying the draft contract received from the consultant since July 9, 2015. The contract received County Administration approval and signature on January 5, 2016.

With the updated timeline provided by the consultant, the projected completion of project will be August 1, 2016 assuming there are no delays in getting information returned. I would like to request an extension on the HMGP, Disaster FEMA-DR-4090-DE to October 15, 2016 in order to complete the plan, obtain community adoption and process all necessary paperwork. Should you have any questions, please do not hesitate to contact me.

Respectfully,

Joseph Thomas
Director

Project Timeline

The following timeline assumes a January 5th 2016 start date. Dates of specific meetings will be determined by the HMP Committee as the project is ongoing. This timeline can be adjusted by the HMP committee as needed.

Task	# of Weeks/Month	Details
Project Management	Continuous throughout project	Monthly status reports to the Sussex County Project Officer Frequent communication and prompt reply to email and phone calls
Task 1 – Conduct Project Kickoff Meeting	Conducted within two weeks of contract execution *Conducted January 8, 2016	Review scope of project Identify a steering committee/planning team Refine project schedule
Task 2 – Review Documents	Weeks 2 through 4	Review existing HMP Review floodplain/other pertinent ordinances Review other documents (e.g. land use, zoning, etc.)
Task 3 – Conduct Stakeholder Kick-off Meeting	Week 5 *Scheduled for January 20, 2016	Introduce the project to public and private stakeholders Provides first opportunity for municipal participation Sets the stage for the planning effort
Task 4 – Update Risk Assessment	Week 6 - Review with steering committee *Weeks 7-Public Meeting*	Update risk assessment Produce hazard maps Review during public meeting
Task 5 – Review and Update Mitigation Strategy	Week 9 - Review with steering committee *Week 10-Public Meeting*	Update status of mitigation projects Identify new projects for County/municipalities
Task 6 – Complete Revised Draft	Week 13 - Draft complete	Incorporates new risk assessment/mitigation strategy Update all other plan parts
Task 7 – Review and Finalize Updated Draft	Week 15 - Review with steering committee Weeks 16 thru 19 Mandatory public comment period Week 20 - *Public meeting*	Ensure consistency throughout document Make necessary changes
Task 8 – Submit Draft to DEMA	Week 21 - Submit draft	Submit via appropriate means (e.g. hard copy, electronic, etc.)
Task 9 – Submit Draft to FEMA Region IV	Week 23 - Submit draft	Submitted after initial review by DEMA
Task 10 – Facilitative Adoption	Targeted for Week 27 - Following "received pending community adoption"	Present to County/municipalities for formal adoption
Task 11 – Conduct Close-out Meeting	Week 27 - 29	

AGREEMENT BETWEEN

SUSSEX COUNTY COUNCIL

AND

THE OLSON GROUP, LTD.

SUBJECT: Sussex County Multi-Jurisdictional Hazard Mitigation Plan Update

THIS AGREEMENT made and entered into this 5 day of January, 2016, by and between Sussex County, a political subdivision of the State of Delaware, with an address of 2 The Circle, P.O. Box 589, Georgetown, DE 19947, hereinafter referred to as the COUNTY, and The Olson Group, Ltd., a corporation of the Commonwealth of Virginia, with an address of 600 N. Washington Street, Sue 600, Alexandria, VA 22314, hereinafter referred to as the CONSULTANT.

WITNESSETH:

WHEREAS, the COUNTY has selected the CONSULTANT to perform services for the Update of the Sussex County Multi-Jurisdictional Hazard Mitigation Plan, hereinafter referred to as the PROJECT; and

WHEREAS, the CONSULTANT has agreed, and by these presents does agree with the COUNTY for the consideration hereinafter mentioned, to provide the categories of services enumerated hereinafter and more specifically defined hereinafter so as to assure, insofar as it is reasonably within its power to do so, the satisfactory completion of the PROJECT for the COUNTY in accordance with the Scope of Work contained herein.

NOW, THEREFORE, for and in consideration of the mutual covenants, hereinafter stipulated to be kept and performed, it is mutually agreed between the parties as follows:

ARTICLE ONE

DEFINITIONS

1.1 COUNTY means the Sussex County Council, a political subdivision of the State of Delaware created by Title 9, Delaware Code, Chapter 70.

1.2 CONSULTANT means The Olson Group, Ltd.., a corporation of the Commonwealth of Virginia, which is contracted or to be contracted by the COUNTY to provide professional consultant services for the County of Sussex, Delaware.

1.3 PROJECT means Update of the Sussex County Multi-Jurisdictional Hazard Mitigation Plan.

ARTICLE TWO

SCOPE OF WORK

2.1 All services or work required of the CONSULTANT under the terms and conditions of this Agreement shall be the responsibility of the CONSULTANT, subject to the review and the reasonable approval of the COUNTY. The CONSULTANT shall perform any and all services necessary to satisfactorily accomplish the work required to be performed under this Agreement.

2.2 All services and work performed by the CONSULTANT under this Agreement shall be subject to the approval of all applicable Federal, Regional, State, County, Municipal, and other public governmental agencies which the COUNTY and/or the CONSULTANT can reasonably identify as having jurisdiction. Where the approval of the COUNTY is indicated herein, the approval of such agencies hereinbefore stated, including all applicable agencies of the COUNTY, shall be deemed to be required. The CONSULTANT shall prepare its work

PROJECT in a professional manner, intended to obtain approval of such agencies. Close cooperation between such agencies hereinbefore stated and the CONSULTANT is intended in order that the interest of all agencies may best be served. At the COUNTY'S request, the CONSULTANT shall confer with the COUNTY and with representatives of all such agencies hereinbefore stated, at such time and place designated by the COUNTY.

The CONSULTANT shall maintain continuing and close liaison with the COUNTY in order to resolve questions and attempt to obtain needed approvals from all such agencies hereinbefore stated so as to permit the work effort for the PROJECT to be uninterrupted. The CONSULTANT cannot and does not guarantee that the approval of any agency, public or private, will be secured; however the CONSULTANT will exert its best efforts to do so on behalf of the COUNTY.

2.3 The CONSULTANT shall perform all professional services assigned to it under the terms and conditions of this Agreement.

2.4 The CONSULTANT shall perform the Scope of Work attached hereto as Exhibit "A" which is incorporated herein by reference and made a part hereof. Any and/or all other services required shall be subject to the mutual agreement of the COUNTY and the CONSULTANT and may be subject to additional scope of work and fee negotiations. The COUNTY and CONSULTANT recognize that scope of the project may change from that defined in Exhibit A, attached hereto. Significant changes in scope will require re-negotiation of fees.

ARTICLE THREE

PROJECT SCHEDULE

3.1 The CONSULTANT shall start work immediately after receiving the notice to proceed with the initial work contemplated by this Agreement. The draft plan deliverable will be provided to the County on or before August 1, 2016. The COUNTY may, in its sole discretion, adjust the time allowances for steps of the work program completion because of additional work or unavoidable delays due to changes requested by the CONSULTANT or for which the CONSULTANT requested and received the prior written approval of the COUNTY.

ARTICLE FOUR

FEE STRUCTURE

4.1 The CONSULTANT represents that the CONSULTANT has thoroughly investigated the COUNTY's requirements and the CONSULTANT shall claim no compensation in addition to the amounts set forth in this Agreement for work as set forth in this Agreement. CONSULTANT acknowledges that this is a fixed fee contract and that all of CONSULTANT'S overhead costs, including, but not limited to, travel, copying, postage, and all other out-of-pocket expense, have been included in CONSULTANT'S price hereunder. No other payments other than those set forth in this Article 4 shall be paid to CONSULTANT.

4.2 The COUNTY shall pay the CONSULTANT for the satisfactory completion of the Scope of

Work specified hereinbefore in Articles 2.4, of this Agreement a fixed fee of Thirty Eight Thousand Dollars ($38,000.00). The total amount the CONSULTANT will invoice to the COUNTY and, accordingly, the total amount the COUNTY shall pay to the CONSULTANT for all work performed under this Agreement, shall not exceed the total payment of $38,000.00 expressly agreed upon by the parties. All expenses are fixed as part of the $38,000.00 total contract payment and the CONSULTANT will not be reimbursed for expenses over and above that amount without prior written authorization by the COUNTY, and only in the event the Scope of Work agreed to herein is exceeded.

4.3 The CONSULTANT shall submit to the COUNTY invoices and supporting documentation for work completed in accordance with the Scope of Work and the Payment Milestone Schedule below.

MILESTONE	APPROX DATE	AMOUNT TO BE PAID
Planning and Organization	Week 2	$ 5,000
Identify/Review Hazards and Losses	Week 7	$ 8,000
Review/Edit Mitigation Actions and Implementation Strategies	Week 25	$15,000
Delivery of Hazard Mitigation Plan	Week 27	$ 5,000
Post-FEMA Review Modifications or Final Deliverable	TBD	$ 5,000
Total		$38,000

CONSULTANT shall submit to COUNTY all invoices, together with any supporting documentation and the work product for each Payment Milestone, to Joseph L. Thomas, Director, Sussex County Emergency Operations Center, 21911 Rudder Lane, P.O. Box 589, Georgetown, DE 19947-0589. The COUNTY shall have the opportunity to examine the CONSULTANT'S work product and supporting documents relating to the completion of each Payment Milestone specified prior to making any scheduled payment to the CONSULTANT. COUNTY'S obligation to make any scheduled payment in accordance with Article 4.4 shall be subject to its sole determination that CONSULTANT has satisfactorily completed the Payment Milestone and that payment is warranted. The COUNTY shall be permitted to request additional Project-related documentation from CONSULTANT for the COUNTY'S review prior to payment.

4.4 For the Scope of Work for which the Payment Milestone Schedule of Article 4.3 of this

Agreement hereinbefore stated is applicable, the COUNTY shall make payments for completed work within thirty (30) days of receipt of an approved invoice. If this Agreement is either terminated upon completion of any stage and/or phase of a stage of the CONSULTANT's services or terminated during any phase of the work, the CONSULTANT shall be paid for services performed up to the point of termination of this Agreement hereinbefore stated on account of that and all prior periodic progress payments to constitute the total payment for services rendered directly by the CONSULTANT. The CONSULTANT will pay any Subcontractor from the total lump sum amount of $38,000; the COUNTY shall not have any obligation to make any payments to any of the CONSULTANT's Subcontractors. Upon termination, the CONSULTANT shall immediately suspend all subcontract work under this Agreement. The CONSULTANT shall submit to the COUNTY verified subcontractor invoices for the work performed prior to termination which shall constitute the total payment for subcontract services rendered. The CONSULTANT shall receive no other compensation.

4.5 It is mutually agreed between the COUNTY and the CONSULTANT that no review, approval, acceptance and/or payment made under this AGREEMENT shall be conclusive evidence of the performance of this AGREEMENT, either wholly or in part, and that no review, approval, acceptance and/or payment shall be constructed to be an acceptance of defective work by the COUNTY, nor in any way relieve the CONSULTANT of its responsibility for the adequacy of its work.

ARTICLE FIVE

CONSULTANT'S RESPONSIBILITIES

5.1 The CONSULTANT shall submit a PROJECT schedule for review and approval and shall perform the Scope of Work in accordance with said PROJECT schedule.

5.2 To the fullest extent permitted by law, the CONSULTANT shall indemnify, hold harmless and defend the COUNTY and its elected and appointed officials, officers, employees and agents from and against any and all claims, damages, injuries and expenses (including related attorney's fees and court costs) arising out of or resulting, in whole or in part, from CONSULTANT's actions or inactions which are in any way related to its role as a CONSULTANT hereunder and its duties with respect hereto, whether occurring in Sussex County, DE or elsewhere, including, but not limited to, claims, damages, losses, injuries or expenses attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible and intangible property, including the loss of use resulting there from, asserted by any person, persons or artificial entity. This indemnification shall be binding on and extend to the CONSULTANT, its employees, servants, representatives, guests, invitees, Subcontractors or contractors, licensees, visitors, etc. regardless of whether or not such claims, damages, injuries and expenses are caused in part by a party indemnified hereunder. CONSULTANT'S indemnification of the COUNTY shall not be limited by the fact that statutory or other limitations may apply to damages, compensation or benefits payable by or for the CONSULTANT.

5.3 The CONSULTANT warrants that the CONSULTANT has not employed or retained any person, company, corporation, individual or firm, other than a bona fide employee working solely for the CONSULTANT to solicit or secure this Agreement, and that the CONSULTANT

has not paid or agreed to pay any person, company, corporation, individual or firm, other than a bona fide employee working solely for the CONSULTANT, any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty the COUNTY shall have the right to terminate this Agreement without liability and, at its discretion to deduct from the fee structure specified in Article 4 of this Agreement. However, the COUNTY will reimburse the CONSULTANT'S work up to the point of termination.

5.4 Upon satisfactory completion of the work performed hereunder and prior to final payment under this Agreement for such work, or prior to settlement upon termination of the Agreement, and as condition precedent thereto, the CONSULTANT shall execute and deliver to the COUNTY a release of all claims against the COUNTY arising under or by virtue of this Agreement, other than such claims, if any, as may be specifically exempted by the CONSULTANT from the operation of the release in stated amounts to be set forth therein.

5.5 In the performance of this Agreement, the CONSULTANT shall, to the extent practicable, provide for maximum use of structures, machines, products, materials, construction methods, and equipment which are readily available through competitive procurement, or through standard or proven production techniques, methods, and processes.

5.6 The CONSULTANT shall not, in the performance of the work called for by this Agreement, produce a design or specification such as to require the use of structures, machines, products, materials, construction methods, equipment, or processes which are known by the CONSULTANT to be available only from a sole source, unless such use has been adequately justified in writing by the CONSULTANT, and approved by the County Engineer.

The CONSULTANT shall report in writing to the COUNTY any sole source or restrictive design or specification giving the reason or reasons why it is considered necessary to restrict the design or specification.

5.7 The CONSULTANT must satisfy the following insurance requirements:

5.7.1 General Insurance Requirements

CONSULTANT shall not commence services until CONSULTANT has obtained, at CONSULTANT's own expense, all of the insurance as required hereunder and such insurance has been approved by COUNTY; nor shall CONSULTANT allow any subcontractor to commence work on any subcontract until all insurance required of the subcontractor has been approved by CONSULTANT. The CONSULTANT shall furnish subcontractor's certificates of insurance to COUNTY immediately upon request. Approval of insurance required of CONSULTANT and its subcontractors will be granted only after submission to COUNTY of original certificates of insurance signed by authorized representatives of the insurers and required endorsements or, at COUNTY's request, certified copies of the required liability insurance policies.

i. CONSULTANT shall require its subcontractors to maintain insurance during the term of the Agreement, to the same extent required of CONSULTANT.

ii. All insurers underwriting CONSULTANT's or subcontractor's insurance must be allowed to do business in the State of Delaware, have and maintain a Best's Financial Strength Rating of "A -" or better, and a Financial Size Category of "Class VII" or better, unless COUNTY grants specific approval for an exception.

iii. Liability insurance as required hereunder shall be in force throughout the term of the Agreement and for three (3) years after the Agreement terminates or expires, whichever is earlier. Original certificates of insurance signed by authorized representatives of the insurers and required endorsements or, at COUNTY's request, certified copies of insurance policies, evidencing that the required liability insurance is in effect, shall be maintained with COUNTY throughout the term of Agreement and for three (3) years after the Agreement terminates or expires, whichever is earlier.

iv. All insurance policies required hereunder shall be endorsed to provide that the policy is not subject to cancellation or non-renewal until sixty (60) days prior written notice has been given to COUNTY (Ten (10) days prior written notice required in the event of non-payment of premium. Therefore, a copy of the endorsements to the required policies that confirm the insurer is obligated to send notice to COUNTY as required herein, must accompany all certificates of insurance.

v. No acceptance and/or approval of any insurance by COUNTY shall be construed as relieving or excusing CONSULTANT from any liability or obligation imposed by the provisions of this Agreement.

vi. If CONSULTANT does not meet the insurance requirements of this Agreement, CONSULTANT shall forward a written request to COUNTY for a waiver in writing of the insurance requirement(s) not met or approval in writing of alternate insurance coverage or self-insurance arrangements. If COUNTY denies the request, CONSULTANT must comply with the insurance requirements as specified herein.

vii. Any deductibles or retentions of $5,000 or greater shall be disclosed by CONSULTANT and are subject to COUNTY's written approval. Any deductible or retention amounts elected by CONSULTANT or imposed by CONSULTANT's insurer(s) shall be the sole responsibility of CONSULTANT, and are not chargeable as expenses.

5.7.2 CONSULTANT's Liability Insurance

CONSULTANT shall secure and maintain the following liability insurance

coverages for not less than the limits specified below or required by law, whichever is greater:

(a) Commercial general liability insurance that insures against claims for bodily injury, property damage, personal and advertising injury arising out of or in connection with services under this Agreement, whether such operations are by CONSULTANT, its employees or subcontractors or their employees. The minimum limits of liability for this insurance are as follows:

(i) $1,000,000 combined single limit – each occurrence
(ii) $1,000,000 combined single limit – personal and advertising injury
(iii) $2,000,000 combined single limit – general aggregate
(iv) $2,000,000 combined single limit – products/completed operations aggregate
(v) This insurance shall include coverage for all of the following:

- Any general aggregate limit shall apply per project;
- Liability arising from premises and operations;
- Liability arising from the actions of independent contractors;
- Liability arising from products and completed operations;
- Contractual liability including protection for CONSULTANT from bodily injury and property damage claims arising out of liability assumed under this Agreement;
- Liability arising from the explosion, collapse and underground (XCU) hazards;
- Additional insured endorsements that name COUNTY and its elected and appointed officials, officers, employees and agents that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 04 13 and CG 20 37 04 13 (together) or their equivalents; and
- Endorsement naming COUNTY and its elected and appointed officials, officers, employees and agents on ISO Endorsement CG 24 04 Waiver of Transfer of Rights of Recovery" or its equivalent.
- A copy of the endorsements referenced in the two proceeding bulleted paragraphs must accompany any certificate of insurance provided to COUNTY

(b) Business auto liability insurance that insures against claims for bodily injury and property damage, with a minimum combined single limit of $1,000,000 per accident and including coverage for claims arising out of:

(i) The ownership, maintenance or use of any auto; and

(ii)Contractual liability including protection for CONSULTANT from bodily injury and property damage claims arising out of liability assumed under this Agreement.

(c) Worker's compensation insurance with statutory benefits as required by any state or Federal law, including standard "other states" coverage and employer's liability insurance with minimum limits of $100,000 each accident for bodily injury by accident; $100,000 each employee for bodily injury by disease; and $500,000 policy limit for bodily injury by disease. The minimum limits may be satisfied with a combination of employers' liability and umbrella excess liability insurance.

This insurance shall include DCRB form WC 00 03 13 "Waiver of Our Right of Recovery from Others Endorsement", or its equivalent naming COUNTY and its elected or appointed officials, officers, employees and, agents on the schedule therein. A copy of this endorsement must accompany any certificate of insurance provided to COUNTY.

(d) Umbrella Excess Liability Insurance coverage for $1,000,000 each occurrence; $1,000,000 aggregate other than products/completed operations and auto liability; $1,000,000 products/completed operations aggregate; and including coverage for commercial general liability, business auto liability and employers liability. This insurance shall afford insured status to all individuals and entities required to be insureds on underlying insurance, to the same extent as the underlying insurance.

(e) Insurance provided to COUNTY and its elected and appointed officials, officers, employees and agents specified herein, shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of insurance. Any cross suits or cross liability exclusion shall be deleted from CONSULTANT's liability insurance policies required herein.

(f) Insurance provided to COUNTY and its elected and appointed officials, officers, employees and agents by CONSULTANT as specified herein shall be primary, and any other insurance, coverage or indemnity available to COUNTY and its elected and appointed officials, officers, employees and agents shall be excess of and non-contributory with

insurance provided to COUNTY and its elected and appointed officials, officers, employees and agents by CONSULTANT as specified herein.

(g) For any "claims made" basis liability insurance purchased by CONSULTANT, CONSULTANT must comply with the following additional conditions. The limits of liability and the extensions to be included remain the same. CONSULTANT must either:

(i)Agree to provide certificates of insurance to COUNTY evidencing the above coverages for a period of three (3) years after the Agreement terminates or expires, whichever is earlier. Such certificates shall evidence a retroactive date no later than the beginning of the services under this Agreement; or

(ii)Purchase an extended (minimum three (3) years) reporting period endorsement for each such "claims made" policy in force as of the date the Agreement terminates or expires, whichever is earlier and evidence the purchase of this extended reporting period endorsement by means of a certificate of insurance and a copy of the endorsement itself. Such certificate or copy of the endorsement shall evidence a retroactive date no later than the beginning of the services under this Agreement.

5.8 The CONSULTANT shall secure, maintain and furnish the COUNTY copies of its State of Delaware business license and its Delaware Association of Professional Engineer Certificate of Authorization, if applicable. The CONSULTANT shall also furnish the COUNTY with such copies of all required licenses and permits, and authorizations for its agents and subcontractors.

5.9 The CONSULTANT shall comply with all Federal, Regional, State, County, Municipal and/or all other laws applicable to the work to be done by the CONSULTANT under this Agreement.

5.10 The CONSULTANT shall make no charges or claims for damages for any delays or hindrances from any cause. Such delays and hindrances shall be compensated for by the extension of time in the PROJECT schedule as defined in Article 3 of this Agreement with the written prior approval of the COUNTY.

5.11 The CONSULTANT shall notify the COUNTY in writing if the CONSULTANT is of the opinion that any work is beyond the Scope of Work specified in Article 2 of this Agreement. The COUNTY shall render the final decision after reviewing the CONSULTANT's written opinion.

5.12 The CONSULTANT shall meet with the COUNTY in the event that any matter cannot be resolved in a mutually satisfactory manner. All interested parties shall be present with the COUNTY hearing all arguments and rendering the final decision.

5.13 The CONSULTANT shall provide all labor, all services, all materials and the like necessary to satisfactorily complete the Scope of Work contained in Article 2 of this Agreement for the PROJECT, except as otherwise provided herein.

5.14 The CONSULTANT and its subcontractors shall make itself and the necessary records available for any audit proceedings that are or may be required.

ARTICLE SIX

COUNTY'S RESPONSIBILITIES

6.1 The COUNTY shall furnish the CONSULTANT with any pertinent information that is available to the COUNTY and applicable to the PROJECT. On request from the CONSULTANT, the COUNTY shall provide the CONSULTANT with one (1) copy of such pertinent information without cost.

6.2 The COUNTY shall as far as possible and practical, cooperate with the CONSULTANT in making necessary arrangements with public and/or private agencies.

6.3 The COUNTY shall designate a person to act with authority on its behalf in respect of all aspects of the PROJECT.

6.4 The COUNTY shall respond to the CONSULTANT's requests for reviews and approvals of its work, and to its requests for decisions related to the prosecution of the PROJECT.

ARTICLE SEVEN

INDEPENDENT CONTRACTOR

7.1 Other than Mangeri Group, LLC, the CONSULTANT is an independent contractor and this Agreement shall not constitute the COUNTY a partner or agent of the CONSULTANT. The CONSULTANT shall assume and pay all liabilities and perform all obligations imposed with respect to the performance of this Agreement. CONSULTANT shall have no right, power or authority to create any obligation, expressed or implied, on behalf of the COUNTY and shall have no authority to represent the COUNTY as an agent of the COUNTY.

ARTICLE EIGHT

SUBCONTRACTS

8.1 All subcontracts proposed to be entered into by the CONSULTANT pursuant to this Agreement shall be subject to the prior written approval of the COUNTY.

ARTICLE NINE

AMENDMENT OF AGREEMENT

9.1 This Agreement constitutes the final, entire and exclusive agreement between the parties with respect to the subject matter of all matters discussed in it and supersedes all prior or contemporaneous discussions, statements, representations, warranties or agreements, whether written or oral, made in connection with the Agreement described herein. This Agreement may only be amended, modified, or extended by prior written approval of both the COUNTY and the CONSULTANT.

ARTICLE TEN

SUCCESSORS AND ASSIGNMENTS

10.1 The COUNTY and the CONSULTANT each binds itself, its successors, legal representatives and assigns, to the other party of this agreement, and to the successors, legal representatives and assigns of such other party in respect of all covenants to this Agreement. Except as hereinbefore mentioned, the CONSULTANT shall not assign, sell, mortgage, or transfer its interest in this Agreement without the prior written consent of the COUNTY.

ARTICLE ELEVEN

NON-DISCRIMINATION

11.1 In connection with the carrying out of this Agreement the CONSULTANT shall not discriminate against any employee because of an individual's race, marital status, genetic information, color, age, religion, sex (including pregnancy), sexual orientation, gender identity, or national origin. The CONSULTANT shall take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to their race, marital status, genetic information, color, age, religion, sex (including pregnancy), sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or terminations; rates of pay or other forms of compensation; and selection or training including apprenticeship.

ARTICLE TWELVE

RECORDS AND AUDIT

12.1 The CONSULTANT shall maintain such records and require maintaining in similar manner such records of its subcontractors with respect to amounts payable under Article 4 of this Agreement, including evidence of the CONSULTANT'S payment of all amounts due to any subcontractors. All checks, payrolls, invoices, contracts, agreements, vouchers or other accounting documents pertaining in whole or in part to the work shall be clearly identified, readily accessible and to the extent feasible, kept separate from all other such documents. Documentation supporting the Payment Milestone Schedule set forth in Article 4 shall be included with the any invoice the CONSULTANT submits to the COUNTY. The CONSULTANT shall cause or provide free access to the COUNTY'S authorized employees

and representatives at all times to such books and records and the right to examine and audit the same and to make transcripts there from as necessary to allow inspection of all work data, documents, proceedings and activities related to this Agreement. The CONSULTANT shall permit the authorized representative of the COUNTY to inspect and audit all appropriate data and records of the CONSULTANT relating to the carrying out of this Agreement and shall maintain all such records for a minimum period of three (3) years following the termination of this Agreement or, in the event of litigation or claims with third parties, until such litigation or claims have been disposed of. The CONSULTANT shall include similar provisions of this Article in all subcontracts which it negotiates with respect to the work.

ARTICLE THIRTEEN

TERMINATION

13.1 Termination of Agreement for Cause. If the CONSULTANT shall fail to fulfill any of its obligations under this Agreement, CONSULTANT shall be considered in breach of this Agreement. The COUNTY shall provide written notice of the breach to the CONSULTANT demanding that the breach be cured. The CONSULTANT shall have ten (10) business days from the date of the notice to cure the breach. If the CONSULTANT fails to cure the breach within the specified ten (10) day period, the COUNTY shall have the right to terminate this Agreement for cause by giving written notice thereof to the CONSULTANT specifying the effective date of said termination. In such event, all documents, data studies, and reports prepared by the CONSULTANT under this Agreement, whether finished and unfinished, shall, at the option of the COUNTY, become its property and the CONSULTANT shall be entitled to receive equitable compensation for any work satisfactorily completed through the date of termination. Notwithstanding the above, the CONSULTANT shall not be relieved of any potential liability to the COUNTY for damages sustained by the COUNTY by virtue of CONSULTANT'S breach of the Agreement. The COUNTY may withhold any payments to the CONSULTANT for the purpose of set-off until such time as the exact amount of damages due the COUNTY from the CONSULTANT is determined.

13.2 Termination for Convenience of COUNTY. The COUNTY may terminate this Agreement at any time by providing the CONSULTANT with at least thirty (30) days written notice of its intention to so terminate. In such event, all documents, data studies, and reports prepared by the CONSULTANT under this Agreement, whether finished and unfinished, shall, at the option of the COUNTY, become its property and the CONSULTANT shall be entitled to receive equitable compensation for any work satisfactorily completed through the date of termination.

13.3 Alternates to Termination. In the event the CONSULTANT fails to fulfill the terms and conditions of this Agreement in a timely and diligent manner, the COUNTY reserves the right, at its sole discretion, to reduce the services required herein of the CONSULTANT and reduce the project budget in a manner which reflects such a reduction, by giving written notice of such stating the date such reduction shall become effective.

ARTICLE FOURTEEN

INCORPORATED DOCUMENTS

14.1 This Agreement incorporates the following exhibits:

EXHIBIT "A": SCOPE OF WORK

ARTICLE FIFTEEN

DISCLOSURE AND COUNCIL APPROVAL

15.1 The parties agree and acknowledge that this Agreement may be subject to the approval of the Sussex County Council and will be subject to discussion and disclosure in a public forum through that approval process. The parties further acknowledge that COUNTY is a governmental entity that is subject to the Freedom of Information Act laws (29 Del. C. § 10001, et. seq., as may be hereafter amended), and this Agreement and any documents associated therewith may be subject to disclosure pursuant to the COUNTY'S interpretation of those laws in its sole discretion. To the extent that any information provided to the COUNTY is considered by CONSULTANT to be financial or commercial information that is confidential and/or privileged or 'trade secret' as defined by Delaware law, the information shall be clearly and conspicuously marked as such by CONSULTANT. Such label shall not be binding upon the COUNTY, which may release said information if required by applicable laws as determined by COUNTY in its sole discretion.

ARTICLE SIXTEEN

CONFIDENTIALITY

16.1 CONSULTANT shall be responsible for ensuring that all reports and analyses of any type which are developed by or communicated to CONSULTANT or any of its affiliates in performing the Work for this Project and that all information, oral or written, obtained by CONSULTANT in connection with this Agreement from the COUNTY shall not be disclosed without prior written approval from the COUNTY. This obligation of CONSULTANT shall survive the expiration, suspension, or termination of this Agreement. This obligation of confidentiality shall not apply to information: (a) that CONSULTANT can demonstrate was previously known, or available, to CONSULTANT on an unrestricted and non-confidential basis; (b) that is or becomes a part of the public domain through a third party without breach of this Agreement by CONSULTANT; (c) that is or becomes available to CONSULTANT on a non-confidential basis from a third party source that is not prohibited from disclosing such information to CONSULTANT by a legal, contractual or fiduciary obligation; or (d) that must be disclosed pursuant to legal requirements to which CONSULTANT is subject if such disclosure is mandatory upon CONSULTANT and failure to so disclose would subject

CONSULTANT to civil or criminal penalties.

These disclosure restrictions shall continue in effect upon completion of this Agreement for such period of time as may be mutually agreed upon in writing. In the absence of a written established period, no disclosure is authorized. Failure to comply with the provisions of this clause may be cause for termination of Agreement.

ARTICLE SEVENTEEN

MISCELLANEOUS PROVISIONS

17.1 The terms of this Agreement are contractual and not a mere recital. Should any portion of this Agreement be held void, the remainder shall continue in full force and effect. This Agreement is executed without reliance upon any representation by the other party or its representatives, and the undersigned have carefully read this Agreement, have been advised of its meaning and consequence by an attorney of their choosing and/or had the opportunity to have been advised of its meaning by an attorney of their choosing, and sign the same of their own free will. In entering into this Agreement, the undersigned warrant that they have done so voluntarily and of their own accord without reliance on any inducement, promise or representation by any other party, except those which are expressly set forth in this Agreement.

17.2 This Agreement may be executed in counterparts, each of which shall be deemed to be an original, but all of which, taken together, shall constitute one and the same agreement.

17.3 This Agreement shall be governed by and construed in accordance with the laws of the State of Delaware without respect to its choice of law provisions.

17.4 Time is of the essence for purposes of this Agreement.

17.5 It is mutually agreed between the COUNTY and the CONSULTANT that no review, approval, acceptance, and/or payment made under this Agreement shall be conclusive evidence of the performance of the Agreement, either wholly or in part, and that no review, approval, acceptance, and/or payment shall be construed as acceptance of defective work by the COUNTY, nor in any way relieve CONSULTANT of its responsibility for the adequacy of its Work.

17.6 The waiver by any party hereto of a breach of any provision of this Agreement shall not operate or be construed as a waiver of any subsequent breach. Neither party shall be deemed to have waived any rights under this Agreement unless such waiver is expressly given in writing and signed by the waiving party. No delay or omission on the part of either party in exercising any right shall operate as a waiver of such right or any other right."

IN WITNESS WHEREOF, the parties hereunto have caused this Agreement to be executed by their duly authorized officers on the respective dates set forth below.

FOR THE COUNTY:

SUSSEX COUNTY COUNCIL

Date: 1/5/16

By: _____
Michael H. Vincent, President of the Sussex County Council

Attest: _____
Robin Griffith, Clerk of the Sussex County Council

FOR THE CONSULTANT:

THE OLSON GROUP, LTD.

Date: DECEMBER 1, 2015

By: _____
KYLE B. OLSON, PRESIDENT
Print Name and Title

(CORPORATE SEAL)

Attest: _____
Nana Bickerts Senior Associate
Print Name and Title

From: Joseph Thomas [mailto:jthomas@sussexcountyde.gov]
Sent: Tuesday, August 02, 2016 4:00 PM
Subject: Sussex County Multi-Jurisdictional Hazard Mitigation Plan Update
Importance: High

In an effort to complete the remaining elements of the update to the Multi-Jurisdictional Hazard Mitigation Plan, we need your help. I understand this is short notice but we are asking for one hour of your time to update your jurisdiction's information. We are asking for a representative to come to the Emergency Operations Center on either August 10th or 11th to be interviewed and update inputs from the previous plan. We will have the capacity to schedule 2 communities per hour. Please contact Kelly Kruger from my office at 302-855-7801 to schedule your time, I have attached an interview schedule to help you pick a time. We will be preparing individualized sheets for each participating jurisdictions and these sheets will be sent prior to the workshop so that officials can review the content from the 2010 plan. To further support the demonstration of inclusion of the Sussex County jurisdictions, it would be helpful to receive an email from each jurisdiction with the following statement:

"The Town of _____ supports and endorses the Sussex County Multi-Jurisdictional All Hazard Mitigation Plan 2016 Update and intends to participate as required in the plan update process".

We are going to schedule a combined working group/steering group meeting on September 1, 2016 at 1:30 PM at the Emergency Operations Center.

Thank you for your support and should you have any questions, please do not hesitate to contact me.

Joseph (Joe) L. Thomas
Director
Sussex County Emergency Operations Center
21911 Rudder Lane
P.O. Box 589
Georgetown, DE 19947-0589
302-855-7801
302-855-7805 Fax
jthomas@sussexcountyde.gov

From:	Joseph Thomas
To:	Adam Michael Montella; Anthony S. Mangeri
Subject:	FW: Final Draft Sussex County Multi-Jurisdictional All Hazard Mitigation Plan Update
Date:	Tuesday, September 6, 2016 10:41:46 AM
Attachments:	Final Draft Sussex County HMP Update 09012016_pd.pdf
Importance:	High

Sent this to Working Group and all Local Jurisdictions.

From: Joseph Thomas
Sent: Tuesday, September 06, 2016 10:38 AM
Subject: Final Draft Sussex County Multi-Jurisdictional All Hazard Mitigation Plan Update
Importance: High

First, my apologies for the some of you not being able to get into the meeting on Thursday, September 1st for the presentation of the final draft of the hazard mitigation plan. We did not anticipate we would have that many people from the public attend the meeting.

With that, some of you did not get to see the information presented so we are sending you the final draft in PDF format for your review and comment. I respectfully request a quick turnaround in your review as we need to submit to DEMA and FEMA for review. The final draft has also been posted on the County's website at www.sussexcountyde.gov/all-hazard-mitigation-plan.

I am requesting your comments back no later than close of business Friday, September 9th.

Thank you for your participation in the update process, the fact that 20 of 24 incorporated jurisdictions have provided input is great and shows our continued strong working relationship.

Joe

Joseph (Joe) L. Thomas
Director
Sussex County Emergency Operations Center
21911 Rudder Lane
P.O. Box 589
Georgetown, DE 19947-0589
302-855-7801
302-855-7805 Fax
jthomas@sussexcountyde.gov

From: Joseph Thomas
Sent: Tuesday, September 06, 2016 10:57 AM
To: Ebling, Bryan (Caroline County, MD); Faulkner, Colin (Kent County, DE); Garvin, Stevin (Dorchester County, MD); Rhode, Robert (Ocean City, MD); Shipley, Dave (Wicomico County, MD); Webster, Fred (Worcester, MD)
Subject: Final Draft Sussex County Multi-Jurisdictional All Hazard Mitigation Plan Update

Sussex County is in the process of its required update to our All Hazard Mitigation Plan. We contracted a consultant to update the plan and they have suggested that we share the final draft with all our surrounding counties, including Maryland, for your review and comment if you desire. This is a necessary outreach effort that is looked on favorably by FEMA.

With that, we are sending you the final draft in PDF format for your review and comment. I respectfully request a quick turnaround in your review as we need to submit to DEMA and FEMA for review. The final draft has also been posted on the Sussex County website at www.sussexcountyde.gov/all-hazard-mitigation-plan.

I am requesting comments back no later than close of business Friday, September 9th.

Thank you,
Joe

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ANNEX D: ADOPTION RESOLUTIONS FOR SUSSEX COUNTY AND PARTICIPATING MUNICIPALITIES

Contents of this Appendix

In accordance with the Disaster Mitigation Act of 2000 (DMA 2000) and the Requirement §201.6(c)(5), Sussex County, Delaware, has developed this Multi-Jurisdictional All Hazard Mitigation Plan Update to address the hazards that threaten the county and ways to reduce future damages associated with these hazards.

Following this page is a sample adoption resolution template for the county's potential use and the signed adoption resolutions of the county and all participating jurisdictions that have adopted this Plan, authorizing municipal government staff to carry out the actions detailed herein.

D.1 Sussex County

[Insert copy of Sussex County resolution]

D.2 Municipalities

[Insert list and copies of Municipal resolutions]

Annex D

RESOLUTION OF ADOPTION

Sussex County, Delaware All-Hazards Mitigation Plan Update

WHEREAS the [insert jurisdiction] is vulnerable to damages from hazard events which pose a threat to public health and safety and could result in property loss and economic hardship;

WHEREAS a Multi-Jurisdictional All-Hazards Mitigation Plan Update (the Plan) has been developed through the work of the Sussex County Hazard Mitigation Working Group, and interested parties within the [insert jurisdiction];

WHEREAS the Plan recommends hazard mitigation actions that will protect people and property affected by hazards occurring within the [insert jurisdiction], that will reduce future public, private, community and personal costs of disaster response and recovery; and that will reinforce the [insert jurisdiction]'s leadership in emergency preparedness efforts;

WHEREAS the Disaster Mitigation Act of 2000 (P.L. 106-390) (DMA 2000) and associated Federal regulations published under 44 CFR Part 201 require the [insert jurisdiction] to formally adopt an All Hazard Mitigation Plan Update subject to the approval of the Federal Emergency Management Agency to be eligible for federal funds for hazard mitigation projects and activities;

WHEREAS public meetings were held to receive comment on the Plan as required by DMA 2000;

NOW THEREFORE BE IT RESOLVED by the [insert name of governing body] of the [insert jurisdiction] that:

1. [insert jurisdiction] adopts the Sussex County, Delaware Multi-Jurisdictional All Hazard Mitigation Plan Update, dated [insert date of final Plan] as this jurisdiction's official All Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

2. The [insert jurisdiction] officials identified in the Mitigation Action Plan (Section 6) are hereby directed to implement the recommended actions assigned to them. These officials will report quarterly on their activities, accomplishments, and progress to the [insert jurisdiction] Office of Emergency Management and the [insert jurisdiction] [name(s) of additional departments or organizations (if any)].

3. The [insert jurisdiction] Office of Emergency Management will provide annual progress reports on the status of implementation of the Plan to the [insert name of governing body]. This report shall be submitted to the [insert name of governing body] by [insert date] of each year.

4. The [insert jurisdiction] Office of Emergency Management will undertake periodic updates of the Plan in concert with the Sussex County Emergency Operations Center as indicated in the Plan Maintenance Program (Section 7) but no less frequent than every five years.

ADOPTED this [insert date] at the meeting of the [insert name of governing body].

_____

([insert title of elected official])

_____

(Clerk)

ANNEX E: FORMAL APPROVAL LETTERS FOR SUSSEX COUNTY AND PARTICIPATING MUNICIPALITIES.

Contents of this Appendix

In accordance with the Disaster Mitigation Act of 2000 (DMA 2000) and the Requirement §201.6(c)(5), Sussex County, Delaware, has developed this Multi-Jurisdictional All Hazard Mitigation Plan Update to address hazards that threaten the county and ways to reduce future damages associated with these hazards.

Following this page are the signed approval letters to all participating jurisdictions that have been approved within this Plan

E.1 Sussex County

[Insert copy of Sussex County approval letter]

E.2 Municipalities

[Insert list and copies of Municipal approval letters]

Annex E

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