U.S. Department of Homeland Security
FEMA Region IV
3003 Chamblee Tucker Road
Atlanta, GA 30341

FEMA

November 4, 2010

Mr. Doug Hoell, Director
North Carolina Division of Emergency Management
4713 Mail Service Center
Raleigh, North Carolina 27699-4713

Attention: Mr. Chris Crew
State Hazard Mitigation Officer

Reference: Single-jurisdiction Local Hazard Mitigation Plan Update: Town of Pembroke

Dear Mr. Hoell:

We are pleased to inform you that the Town of Pembroke Local Hazard Mitigation Plan Update is in compliance with the Federal hazard mitigation planning standards resulting from the Disaster Mitigation Act of 2000, as contained in 44 CFR 201.6. The Plan is approved for a period of five (5) years, to November 4, 2015.

The Town of Pembroke is hereby an eligible applicant through the State for the following mitigation grant programs administered by the Federal Emergency Management Agency (FEMA):

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Severe Repetitive Loss (SRL)
- Flood Mitigation Assistance (FMA)

We commend the Town of Pembroke for development of a solid, workable plan that will guide hazard mitigation activities over the coming years. Please note all requests for funding will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted. For example, a specific mitigation activity or project identified in the plan may not meet the eligibility requirements for FEMA funding, and even eligible mitigation activities are not automatically approved for FEMA funding under any of the aforementioned programs.

We strongly encourage the community to perform an annual review and assessment of the effectiveness of their hazard mitigation plan; however, a formal plan update is required at least every five (5) years. We also encourage the community to conduct a plan update process within one year of being included within a Presidential Disaster Declaration or of the adoption of major modifications to their local Comprehensive Land Use Plan or other plans that affect hazard mitigation or land use and development. When the Plan is amended or revised, it must be resubmitted through the State as a "plan update" and is subject to a formal review and approval process by our office. If the Plan is not updated prior to the required five (5) year update, please ensure that the Draft update is submitted at least six (6) months prior to expiration of this plan.

The State and the Town of Pembroke should be commended for their close coordination and communications with our office in the review and subsequent approval of the plan. If you or the Town of Pembroke have any questions or need any additional information, please do not hesitate to contact Mary Margaret Jackson, of the Hazard Mitigation Assistance Branch at 770-220-5234 or Linda L. Byers of my staff at 770-220-5498.

Sincerely,

Robert E. Lowe, Chief
Risk Analysis Branch
Mitigation Division

TOWN OF PEMBROKE
NORTH CAROLINA

HAZARD MITIGATION PLAN UPDATE

Adopted by the Pembroke Town Council: October 4, 2010
Approved by the Federal Emergency Management Agency: November 4, 2010

Prepared By:

Holland Consulting Planners, Inc.
Wilmington, North Carolina

TOWN OF PEMBROKE
HAZARD MITIGATION PLAN, 2009 UPDATE

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This section of the Pembroke Hazard Mitigation Plan (HMP) provides an overview to and introduction of the HMP and its constituent elements, as follows:

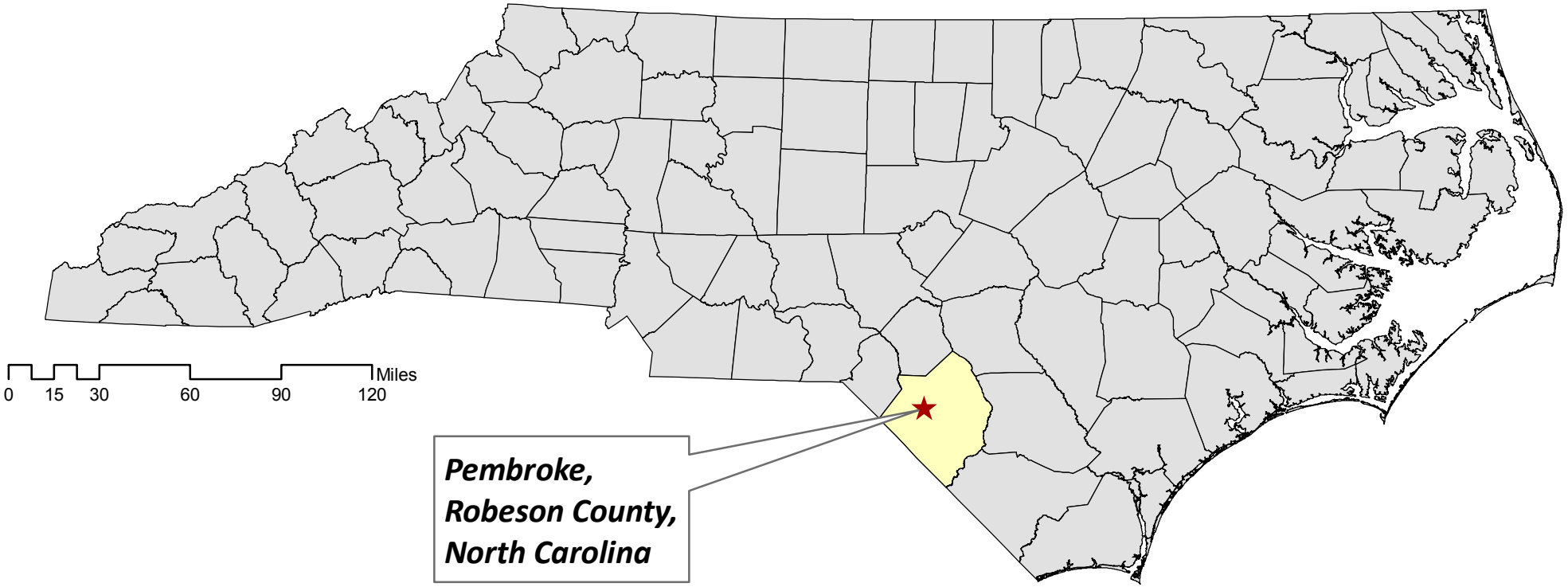
A. Snapshot of the Town of Pembroke
B. What is Hazard Mitigation and Why is it Important to the Town?
C. Planning Process and Plan Format
D. Authority for HMP Adoption and Relevant Legislation

A. Snapshot of the Town of Pembroke

1. Location, Topography, and General Information

The Town of Pembroke is located in central Robeson County. Robeson County is located in the Coastal Plain of North Carolina. The county is bounded by Cumberland County to the north, Bladen and Columbus Counties to the east and southeast, Hoke County to the west, and Scotland County to the southwest. Robeson County shares its southern boundary with the State of South Carolina. The County is the mid-point between Miami, Florida and Boston, Massachusetts along Interstate 95. See Map 1 for a regional location map of Robeson County and the Town of Pembroke.

The soils of Robeson County are nearly level to sloping and are well suited to farming. The majority of the county has an elevation between 100 and 170 feet; however, the extreme northern part of the county has an elevation between 170 and 200 feet. The broad plains are dissected by permanent and intermittent streams that drain the county. All of the county, except the westernmost tip, drains directly into tributaries of the Lumber River, which meanders from north to south through the approximate center of the county. The broad interstream divides are pocketed with thousands of shallow, oval depressions, called Carolina bays. The bays are oriented in a northwest-southeast direction and range in size from less than one acre to more than 1,700 acres.



1 inch = 50 miles

Legend

- Town of Pembroke
- Robeson County
- NC Surrounding Counties

Town of Pembroke
Hazard Mitigation Plan Update

HCP Holland Consulting Planners, Inc.

Regional Location

Map 1

N W E S

2. History

As early as 1724, Cheraw Community was observed along Drowning Creek, in what is now known as Robeson County and the Lumber River. These early settlers of Robeson County are still living there today. Known as the Lumbee Tribe, their history is one of pride and tradition. The Lumbee Tribe today is the largest tribe east of the Mississippi River and the ninth largest tribe in the nation.

Robeson County was formed in 1787 from Bladen County. It was named in honor of Colonel Thomas Robeson, who served as one of the leaders in the Revolutionary War. Robeson County is the second largest county in the state.

The Town of Pembroke was incorporated in 1895. Pembroke was developed around businesses that served the Lumbee Indians. Even after 300 years, Pembroke still remains the social, economic, and political center for the tribe. Originally named Campbell's Mill, the name of the town was changed to Scuffletown, and then finally to Pembroke. The name was derived from Pembroke Jones, a principle shareholder in the Atlantic Coastline Railroad (formerly the Wilmington-Weldon). The railroad played such an important role in the development of the town that its corporate limits were based on the intersection of two railway lines.

A bill was recently introduced in both the US House of Representatives and the Senate to federally recognize the Lumbee Tribe. The State of North Carolina officially recognized the Lumbee Indian Tribe in 1885, and federal recognition is expected by 2004. This federal recognition would bring more than $192 million into Robeson County. This recognition establishes a tribe as an entity with the capacity to engage in government-to-government relations with the United States or individual states and also as one eligible to receive federal services. Federal recognition is established as a result of historical and continued existence of a tribal government, by Executive Order or Legislation, and through the federal recognition process recently established by Congress.

3. Climate

The climate in Robeson County is warm and humid. The average length of the growing season is approximately 225 days, from late March until early November. In the nearly 70 years that records have been kept, the temperature at Lumberton, the county seat, has never been as low as 0°F. The highest temperature on record is 108°F. The temperature rises to 90° or higher on more than half the days in each summer.

A large part of the rainfall during the growing season comes from summer thunderstorms and therefore varies widely from year to year, and even from place to place throughout the county. Rainfall in winter generally results from low pressure storms passing through or near the area and is less variable than in summer. A little sleet or snow occurs almost every winter, but the accumulation is ordinarily small and melts in a few hours.

Cloudiness is variable; the sun shines, on average, more than half the daylight hours in winter and about two-thirds in other seasons. The average relative humidity is about 85 percent at sunrise and drops to near 50 percent by midafternoon.

Tornadoes are rare; however, high winds more often result from summer thunderstorms with winds being very local and of brief duration. Surface winds are variable in all seasons, but the prevailing direction is from the southwest most of the year. The average surface wind speed is about 8 miles per hour.

4. Demographic Snapshot

a. Population

(1) Total Population

According to estimates, as of 2007, the Town of Pembroke has 2,349 people, approximately a twelve percent (12%) decrease since 2000. Approximately eighty percent (80%) of residents are Native American Indian or Alaskan Natives, eleven percent (11%) are White, six percent (6%) are African American, less than one percent (1%) classified themselves as either Asian or other, and two percent (2%) are listed as being of two or more races. Table 1 represents the population distribution by race and the percent change since 2000.

Table 1. Town of Pembroke
Population and Race

Race	2000	2007	% Change
White	268	265	-1%
Black or African American	134	130	-3%
American Indian and Alaskan Native	2,198	1,878	-15%
Asian	14	18	29%
Native Hawaiian or other Pacific Islander	0	0	0%
Some other race	14	15	7%
Two or more races	53	43	-19%
Total Population	2,681	2,349	-12%

Note: In August 2002 the US Census Bureau revised the 2000 population count for Pembroke. The remaining population categories were unchanged. Therefore, to determine the totals for the races listed above percentages of each race from the 2000 census were applied to the revised population total from 2002.
Source: NC State Data Center, Office of State Budget and Management, and "PCensus Demographic Estimates".

(2) Gender Composition

Table 2 provides a breakdown of the percentage change in population by sex for Pembroke. Since 1990, Pembroke's male and female populations have each decreased. As of 2007, the female population comprised fifty-five percent (55%) of the total population. The male and female populations each comprise fifty percent (50%) of the population in the surrounding area.

Table 2. Town of Pembroke
Gender Composition

Gender	2000	2007	% Change
Male	1,153	1,064	-7.7%
Female	1,528	1,285	-16.0%
Total Population	2,681	2,349	-12.0%

Note: In August 2002 the US Census Bureau revised the 2000 population count for Pembroke. The remaining population categories were unchanged. Therefore, to determine gender totals the percentages for each gender from the 2000 census were applied to the revised population total from 2002.
Source: NC State Data Center, Office of State Budget and Management, and "PCensus Demographic Estimates".

(3) Age Composition

Table 3 provides a breakdown of the population by age group. According to the table, the fastest growing age group is the 0-4 age group. Between 1990 and 2000, the number of individuals in this age bracket increased by 57%. However, the largest age group within Pembroke is between 18 and 64 indicating a strong working age population. According to the 2000 Census, forty-three percent (43%) of the persons living in the area surrounding Pembroke are in the 18-64 year old age group. Thirty-two percent (32%) of those persons are in the 5-17 year old age group. No demographic forecasts are currently available to update this portion of the community profile.

Table 3. Town of Pembroke
Population Characteristics by Age Group

Age Group	1990	2000	%Change	% of Total Pop*
0-4	205	322	57%	12%
5-17	521	617	18%	23%
18-64	1,271	1,475	16%	55%
65+	244	267	9%	10%
Total	2,241	2,681	20%	100%

* Refers to the percentage of total Census 2000 population.
Note: In August 2002 the US Census Bureau revised the 2000 population count for Pembroke. The remaining population categories were unchanged. Therefore, to determine the age group totals percentages for each age group from the 2000 census were applied to the revised population total from 2002.
Source: NC State Data Center, Office of State Budget and Management.

(4) Population Projections

Population projections for Pembroke and Robeson County overall are provided in Table 4. It is emphasized that the forecasts do not take into consideration annexations which may occur. As a result, the town's population may prove to be above the figure that is forecast. By 2030, the Town of Pembroke and the surrounding areas will increase in population by almost forty-two percent (42%). These population estimates are still considered valid. According to Pembroke officials, the 2007 estimates provided in this update are somewhat below local estimates. The town is awaiting the 2010 Census to clarify this issue.

Table 4. Town of Pembroke
Population Projections

	2000	2010	2020	2030
Pembroke	2,681	3,100	3,486	3,865
Surrounding Area	21,899	24,944	28,047	31,097
Total	24,580	28,044	31,533	34,962
Robeson County	123,339	140,932	158,459	175,694

Source: NC State Data Center, Office of State Budget and Management and Holland Consulting Planners, Inc.

b. Housing

(1) Structure Age

Forty-five percent (45%) of the houses in the area have been built since 1980. The most significant residential development over the last ten years has centered around student housing for those attending UNCP. Table 5 represents the age of structures located in Pembroke and the surrounding area. Updated information regarding this demographic statistic is not currently available.

Table 5. Town of Pembroke and Surrounding Areas
Year Structure Built

Year Structure Built	Pembroke	Surrounding Areas	Total Structures	% of Total
1999 to March 2000	5	205	210	2.3%
1995 to 1998	54	1,054	1,108	11.9%
1990 to 1994	88	879	967	10.4%
1980 to 1989	164	1,775	1,939	20.8%
1970 to 1979	389	1,882	2,271	24.3%
1960 to 1969	122	1,138	1,260	13.5%
1940 to 1959	215	802	1,017	10.9%
1939 or earlier	79	491	570	6.1%
Total	1,116	8,226	9,342	100.0%

Source: NC State Data Center, Office of State Budget and Management.

(2) Housing Value

The median value of homes within Pembroke is sixty-eight thousand four hundred dollars ($68,400). Seventy-nine percent (79%) of all owner-occupied housing units are priced under $100,000 for Pembroke and the surrounding areas. There is a demand for homes in the higher price ranges within Pembroke as well as Robeson County overall. Less than seven percent (7%) of homes are valued at $150,000 or more. Table 6 describes the value of homes in Pembroke and the surrounding area. Updated information regarding this demographic statistic is not currently available.

Table 6. Town of Pembroke and Surrounding Area
Housing Value

Value	Pembroke	Surrounding Areas	Total Structures	% of Total
Less than $50,000	95	764	859	26.6%
$50,000 to $99,999	144	1,551	1,695	52.4%
$100,000 to $149,999	52	417	469	14.5%
$150,000 to $199,999	16	86	102	3.2%
$200,000 to $299,999	6	78	84	2.6%
$300,000 to $499,999	0	0	0	0.0%
$500,000 to $999,999	0	18	18	0.6%
$1,000,000 or more	5	0	5	0.2%
Total	318	2,914	3,232	100.0%

Source: NC State Data Center, Office of State Budget and Management.

(3) Owner Occupied Monthly Housing Costs

Table 7 provides a summary of housing related costs for all individual households currently carrying a mortgage within Pembroke and the surrounding area. Households with a mortgage within Pembroke spend roughly $725 on housing-related costs monthly. This figure is fairly comparable to Robeson County ($758), but lower than the state median of $985. Forty-six percent (46%) of owner-occupied households currently carry a mortgage within Pembroke and the surrounding area. Updated information regarding this demographic statistic is not currently available.

Table 7. Town of Pembroke and Surrounding Area
Household Housing Cost

Costs	Pembroke	Surrounding Areas	Total Families	% of Total
Less than $300	0	24	24	1.7%
$300 to $499	17	216	233	16.2%
$500 to $699	55	422	477	33.1%
$700 to $999	42	343	385	26.7%
$1,000 to $1,499	29	236	265	18.4%
$1,500 to $1,999	10	17	27	1.9%
$2,000 or more	0	32	32	2.2%
Total with a mortgage	153	1,290	1,443	46.0%
Total without a mortgage	165	1,552	1,697	54.0%
Total Families	318	2,842	3,140	100.0%

Source: NC State Data Center, Office of State Budget and Management.

(4) Units In Structure

The majority of the housing structures within Pembroke and the surrounding area are single-family. Multi-family units or duplexes make up nine percent (9%) of the structures in the area. Students attending the University of North Carolina Pembroke (UNCP) utilize a significant portion of the multi-family housing. Table 8 provides a summary of the number of units in a structure in Pembroke and the surrounding area. Updated information regarding this demographic statistic is not currently available.

Table 8. Town of Pembroke
Units In Structure

Units in Structure	Pembroke	Surrounding Areas	Total Structures	% of Total
1 unit, detached	556	4,042	4,598	48.7%
1 unit, attached	40	102	142	1.5%
2 units	204	133	337	3.6%
3 or 4 units	95	35	130	1.4%
5 to 9 units	87	60	147	1.6%
10 to 19 units	3	32	35	0.4%
20 or more units	29	23	52	0.6%
Mobile Home	102	3,899	4,001	42.4%
Boat, RV, van, etc.	0	0	0	0.0%
Total	1,116	8,326	9,442	100.0%

Source: NC State Data Center, Office of State Budget and Management.

c. Economy

The following information pertaining to the economy within Robeson County and Pembroke was collected from a variety of different sources. In many cases, data is not available at the municipal level, and therefore data for Robeson County overall has been substituted. Overall figures for the county are comparable to those within Pembroke.

(1) Economic Indicators for Robeson County

The following table provides a summary of economic indicators for Robeson County.

Table 9. Town of Pembroke
Robeson County Economic Indicators

Indicator	Year	Robeson County
Unemployment Rate	2009 Q1	11.6%
Establishments (total private industry)	2008	1,902
Median Income	2008	$40,825
Total population below poverty level	2000	27,326

Source: North Carolina Department of Commerce.

(2) Household Income

Table 10 indicates the household income for Pembroke, the surrounding area, and Robeson County. Almost fifty-five percent (55%) of the population in the greater Pembroke area have incomes of $25,000 or more. Updated information regarding this demographic statistic is not currently available.

Table 10. Town of Pembroke, Surrounding Area, and Robeson County
Household Income

Income Range	Pembroke	Surrounding Area	Robeson County
Less than $10,000	369	1,401	8,202
$10,000 to $24,999	189	2,060	11,483
$25,000 to $49,999	231	2,653	13,734

Table 10 (continued)

Income Range	Pembroke	Surrounding Area	Robeson County
$50,000 to $74,999	74	1,186	6,247
$75,000 to $99,999	48	342	2,172
$100,000 to $149,999	27	207	1,268
$150,000 or more	6	93	522

Source: NC State Data Center, Office of State Budget and Management.

(3) Industry

There are a number of industries in Robeson County all located within a reasonable commuting distance of Pembroke. These industries produce a wide range of products, and also provide a significant percentage of job opportunities to Robeson County residents. Table 11 provides a listing of the county's largest industries, along with the required commute time from Pembroke.

Table 11. Robeson County Local Industries

Company	Location	# of Employees	Estimated Commute Time (minutes)
Mountaire Farms, Inc.	Lumber Bridge	1,500	40
Campbell Soup Co.	Maxton	800	20
Kayser-Roth Corp.	Lumberton	430	26
Elkay Southern Corp.	Lumberton	400	26
Outer Banks	Lumberton	400	26
Clayson Knitting Co.	Red Springs	375	26
American Knits LLC	Lumberton	320	20
Genesis Homes, Inc.	Maxton	300	20
Acme Electric Corp.	Lumberton	300	26
Quickie Manufacturing	Lumberton	300	26
M J Soffe Co., Inc.	Rowland	300	34
Contempora Fabrics	Lumberton	250	26
Mueller Steam Specialty	Saint Pauls	235	35
Graphic Packaging Corp.	Lumberton	200	26
Accent Fabrics, Inc.	Lumberton	185	26
Redman Homes	Maxton	180	20
Guilford Mills, Inc.	Lumberton	150	26
Lumberton Dyeing & Finishing	Lumberton	150	26

Source: North Carolina Department of Commerce.

B. What is Hazard Mitigation and Why is it Important to the Town?

1. What is Hazard Mitigation?

Hazard mitigation is the practice of reducing risks to people and property from natural disasters. Hazard mitigation involves recognizing and adapting to natural forces, and is defined by the Federal Emergency Management Agency (FEMA) as any sustained action taken to reduce long-term risk to human life and property from natural hazards. A fundamental premise of hazard mitigation is that current dollars invested in mitigation will significantly reduce the demand for future expenditures by reducing the extent of emergency recovering, repair, and reconstruction following a disaster.

2. Why is Hazard Mitigation Important to the Town?

Hazard mitigation offers the following benefits to Pembroke, and the HMP is being completed to attain the following goals:

- Saving lives and reducing injuries;
- Preventing or reducing property damage;
- Reducing economic losses;
- Minimizing social dislocation and stress;
- Minimizing agricultural losses;
- Maintaining critical facilities in functional order;
- Protecting infrastructure from damage;
- Protecting mental health;
- Limiting legal liability of government and public officials;
- Providing options for political leaders regarding hazard reduction;
- Fulfilling Federal and State requirements for receipt of future disaster recovery and hazard mitigation assistance;
- Improving inter-jurisdictional cooperation and coordination, especially regarding the reduction of natural hazard impacts.

Hazard mitigation planning is intended to construct a framework for the prevention and reaction to disasters if and when they may occur. The framework created by this plan will help to instill an ongoing effort to lessen the impact that disasters have on citizens and property within Pembroke.

C. Planning Process and Plan Format

1. Planning Process

The Town of Pembroke received a grant through FEMA for the development of this Hazard Mitigation Plan Update. Subsequent to authorizing a grant agreement, the Town solicited proposals to conduct the planning process, selected a qualified firm, and the hazard mitigation planning process began within the Town of Pembroke.

Primary responsibility for development of the Town of Pembroke Hazard Mitigation Plan Update was placed in the hands of the Pembroke Administration, under the direction of Channing Jones, Deputy Town Manager. Mr. Jones worked closely with all Town departments throughout the planning process to develop this document.

The Town of Pembroke completed significant data collection which contributed towards plan development. This data assisted primarily in the areas of hazard identification and analysis, mapping of hazards, assessment of community capabilities and identification of critical facilities.

Subsequent to establishing a work authorization with the planning consultant, the Town of Pembroke held an initial scoping meeting with the project consultant. This meeting involved a general discussion of how the project should be carried out, including issues relating to establishing a Mitigation Advisory Committee (MAC) to oversee the update. It was determined that the MAC would be comprised predominantly of administrative officials from the Town.

Dealing with natural hazards and disasters is rarely the responsibility of one employee or official in any community. Rather, it is a team effort, often comprised of representatives from Town management and administration, planning/zoning, public works, fire/police, and other offices (depending on the size of the community).

The Town convened the MAC in order to efficiently address this "multi-disciplinary" aspect of hazard mitigation. MAC members were charged with the responsibility of working through the planning process, and assisting the consultant through compiling the information, input, and background required to develop the plan.

The following outlines all individuals assigned to the MAC, and their related area of expertise in relation to the overall project:

MAC Members	Area of Expertise
McDuffie Cummings	Administration
Channing Jones	Administration
Frank Hernandez	Police Protection
Rhonda Locklear	Public Works

A series of meetings were held to develop the Hazard Mitigation Plan Update, each focusing on a specific aspect of the planning process. A total of four MAC meetings were held, and several additional meetings took place between staff and various interests involving plan development. The following provides a brief summary of all meetings held and what was addressed at each meeting:

- **September 2009:** MAC representatives involving Town staff convened for a scoping and overview meeting with the consultant. This meeting focused on the planning process, and what the Town should aim to get achieve in working through the development of a Hazard Mitigation Plan Update.

- **October 2009:** The second MAC meeting was held in October 2009. The agenda of this meeting focused on a discussion aimed at reviewing critical/community facilities and the goals, policies, and implementing actions within the Town's existing document. Committee members were provided with these sections of the existing plan, and a discussion of each mitigation action ensued. The intent of this discussion was to determine what has been accomplished over the last five years with respect to the mitigation policy in the 2004 update. This discussion also involved making a determination as to whether the 2004 policies and mitigation actions were still applicable. This discussion served as the basis for the development of updated goals, policies, and mitigation actions.

- **November 2009:** Draft mitigation objectives and implementing actions were presented to the MAC. These action statements were reviewed and responsibility was assigned. Time frames have been assigned to each implementing action based on the perceived difficulty of carrying out a given activity. The results of

this effort have been directly translated in to the policy section of the document. This meeting was advertised.

- **January 2010:** On January 4, 2010, a public input and information meeting was held to provide an overview of the draft plan and provide the public with an opportunity to comment on the strategies that had been developed through the MAC. The meeting was held in the Town Council Chambers at the Pembroke Administration Building. This meeting was conducted as an open house with ample opportunity for questions and input from the citizens. On January 19, 2010, the final MAC meeting was held to disseminate and review the draft plan. Subsequent to this date, a review period was established to allow adequate time for Town, regional agencies, and NCEM review and comment. Both of these January meetings were advertised.

The sign-in sheets for all MAC meetings, as well as copies of the advertisements for all publicly advertised meetings have been provided in Appendix A.

As noted, a draft version of the plan was completed on January 19, 2010, and distributed to MAC members and representatives of the following stakeholder offices/organizations for review and comment:

- Robeson County Emergency Management Department
- North Carolina Department of Transportation
- American Red Cross
- Robeson County Administrative Office

Review comments were received from NCEM on March 15, 2010, and revisions were made to the draft HMP based on the NCEM comments (see Appendix D). The final draft HMP was resubmitted to NCEM on April 15, 2010.

Following receipt of a final letter of approval from NCEM, the HMP was forwarded to Town of Pembroke Town Council for adoption. Prior to adoption, however, a final public hearing was held in order to allow the public and the above-identified stakeholder groups the opportunity to make comments on and provide input to the final plan. The affidavit of publication for the public hearing notice and adoption resolution from this meeting have been provided as Appendix C. HMP adoption took place on October 4, 2010.

2. Plan Format

The Town of Pembroke 2009 Hazard Mitigation Plan Update contains the following sections and appendices.

Section 1. Introduction

The plan introduction provides an updated community profile, as well as a revised review of the plan format and planning process. The planning process outlined within this section describes the 2009 plan update development and does not correspond to anything in the 2004 plan.

Section 2. Hazard Identification and Analysis

This section of the plan reviews all hazards required by FEMA and NCEM. A description is provided for each hazard as well as the historic impact of the hazard, hazard intensity, hazard impact, and an indication of the hazard's likelihood of occurrence. Below is a list of the hazards reviewed by the town.

Hurricanes
Thunderstorms/Tornados
Flooding
Nor'easters
Severe Winter Storms
Wildfire
Earthquakes
Sinkholes
Droughts/Heat Waves
Dam/Levee Failures

During the update process, the MAC reviewed all hazards to ensure whether they still pose a threat to the town. Additionally, this section was updated to reflect occurrences of each natural hazard type since adoption of the 2004 plan.

Section 3. Vulnerability Analysis

This section provides a description of the town's major physical features, the location of development within the planning jurisdiction, the location of the town's critical facilities, and a summary of the current and future population numbers, types of development, and development values. This section also includes maps that depict the location of hazard areas and the intersection of those hazard areas with critical facilities.

As a component of the mitigation plan update, the vulnerability analysis was updated to reflect the 2009 development characteristics within the Town of Pembroke. In addition, the critical facilities list was reviewed and updated by the MAC.

Section 4. Community Capability Assessment

This section provides a review of the town's existing capability through an analysis of the town's departments, plans and ordinances, legal authority, and fiscal capability. The capability assessment has been reviewed by the MAC as part of the comprehensive update process. This effort involved the updating of information relating to: administrative capabilities, infrastructure resources, land development controls, and existing local and state policy programs.

Section 5. Mitigation Strategies and Policies

The MAC undertook a comprehensive review of the mitigation strategies outlined within the 2004 plan. This review led to the modification of all existing mitigation strategy statements as reflected in Section 6 of the plan update. Through this effort, the Town is attempting to strengthen their existing mitigation program. The MAC feels that the revised statements are more effective and appropriately define how mitigation initiatives outlined in the plan should be carried out. Please note that the overhaul of the 2004 policies makes it difficult to cross reference the updated strategies with those outlined in the 2004 plan.

Section 6. Plan Maintenance and Implementation Procedures

This section of the plan has been updated to reflect the town's intentions regarding review and implementation of the plan over the next five years. This section was completely redrafted to reflect current conditions.

3. Incorporation of Existing Plans, Studies and Reports

The Town of Pembroke utilized several existing policy and regulatory documents to assist in the preparation of the Hazard Mitigation Plan Update. Information from the Town's Land Use Plan and Zoning Ordinance were instrumental in compiling information presented in this update. Additionally, the land use plan in conjunction with the zoning ordinance provided the Town with the tools to conduct a comprehensive vulnerability assessment. Through implementation of this plan, the Town will continue to reference these documents in an effort to carry out an effective mitigation program within the Town of Pembroke.

4. Adoption

After three MAC meetings, a review by North Carolina Emergency Management, and a public hearing, the Town of Pembroke Town Council adopted the Town of Pembroke Hazard Mitigation Plan Update.

D. Authority for HMP Adoption and Relevant Legislation

This HMP will be adopted by the Town of Pembroke Town Council under the authorities and police powers granted to municipal governments by North Carolina General Statutes (NCGS),Chapter 153A.

The HMP has been developed in accordance with the requirements of the following laws, regulations, and guidance:

- NCGS Chapter 166-A: North Carolina Emergency Management Act, as amended by Senate Bill 300: An Act to Amend the Laws Regarding Emergency Management as Recommended by the Legislative Disaster Response and Recovery Commissioner (a.k.a. Session Law 2001-214), adopted June 15, 2001;

- Public Law 106-390, The Robert T. Stafford Disaster Mitigation Act of 2000, as amended (adopted October 30, 2000);

- Interim Final Regulations regarding Hazard Mitigation Planning and the Hazard Mitigation Grant Program at 44 CFR Parts 201 and 206 as published in the Federal Register: October 1, 2002 (Volume 67, Number 190, Page 61512-61515);

- The July 1, 2008, version of the Local Multi-Hazard Mitigation Planning Guidance (also known as the "Blue Book"). This guide represents FEMA's latest official interpretation of the federal regulations that implement the Disaster Mitigation Act of 2000.

The above laws, regulations and guidance should be carefully monitored to ensure continued compliance.

SECTION 2: HAZARD IDENTIFICATION AND ANALYSIS

A. Introduction

The Hazard Identification and Analysis will provide the Town of Pembroke with background information regarding a number of natural hazards. Although some of the hazards identified in this section are considered to have a low likelihood of occurrence in Pembroke, it is helpful to be aware of all natural hazards that could have an impact in the area. This section is intended to be used as a tool to identify which hazards are the biggest threat to the town and where the town should focus its attention and resources. It will also assist the town in prioritizing mitigation strategies.

The Town of Pembroke Mitigation Advisory Committee reviewed this section of the plan in an effort to determine whether the hazards identified in the 2004 plan are still relevant. Through this review, it was determined that tsunamis and landslides do not pose a realistic threat to the town. Justification for removing these hazards from the plan is provided in later sections of this plan update.

In addition to reviewing the risk associated with each hazard outlined within the 2004 plan, the update provides a summary of all hazard events that have occurred over the last five years within the Town of Pembroke, as well as Robeson County. This approach was taken because most of the data available is reported by County and because a number of these hazards can impact portions of the town in conjunction with unincorporated portions of the County. These summaries, where applicable, have been provided for each hazard type identified.

B. Hazard Identification and Analysis

North Carolina is subject to many different types of natural hazards including earthquakes, hurricanes, nor'easters, thunderstorms/tornadoes, severe winter weather, wildfires, flooding, sinkholes, droughts, and dam/levee failures. The susceptibility of an area to these events depends largely upon its geographic location.

The climate of North Carolina varies considerably from the mountainous region in the west to the eastern coastline. Average temperatures vary by as much as 20 degrees from west to east. Average annual precipitation is generally around 50 inches statewide, but

in the mountains there are significant terrain-induced variations. In light of the west-to-east gradient in climate variability due to topography (and proximity to the Atlantic Ocean) coupled with the north-to-south gradient in temperature due to latitude, North Carolina has been divided into eight climate divisions for purposes of long-term climatological assessments. These climate divisions are considered relatively homogeneous in their long-term climatology, and generalizations relating to the probability of various hazard events occurring in each climate division can be made.

The Town of Pembroke is located in climate division 6 (see Map 2). Based on the characteristics of each climate division, the National Climatic Data Center categorized North Carolina's counties into one of three levels of vulnerability for seven of the natural disasters (Low, Moderate, and High).

To better understand the low, moderate, and high classifications, the North Carolina Local Hazard Mitigation Planning Manual provides the following explanations:

- **Earthquake:** Based on 1-6 (low to high) general seismic vulnerability for buildings in the conterminous United States. Low = 1 or 2; Mod. = 3 or 4; High = 5 or 6.

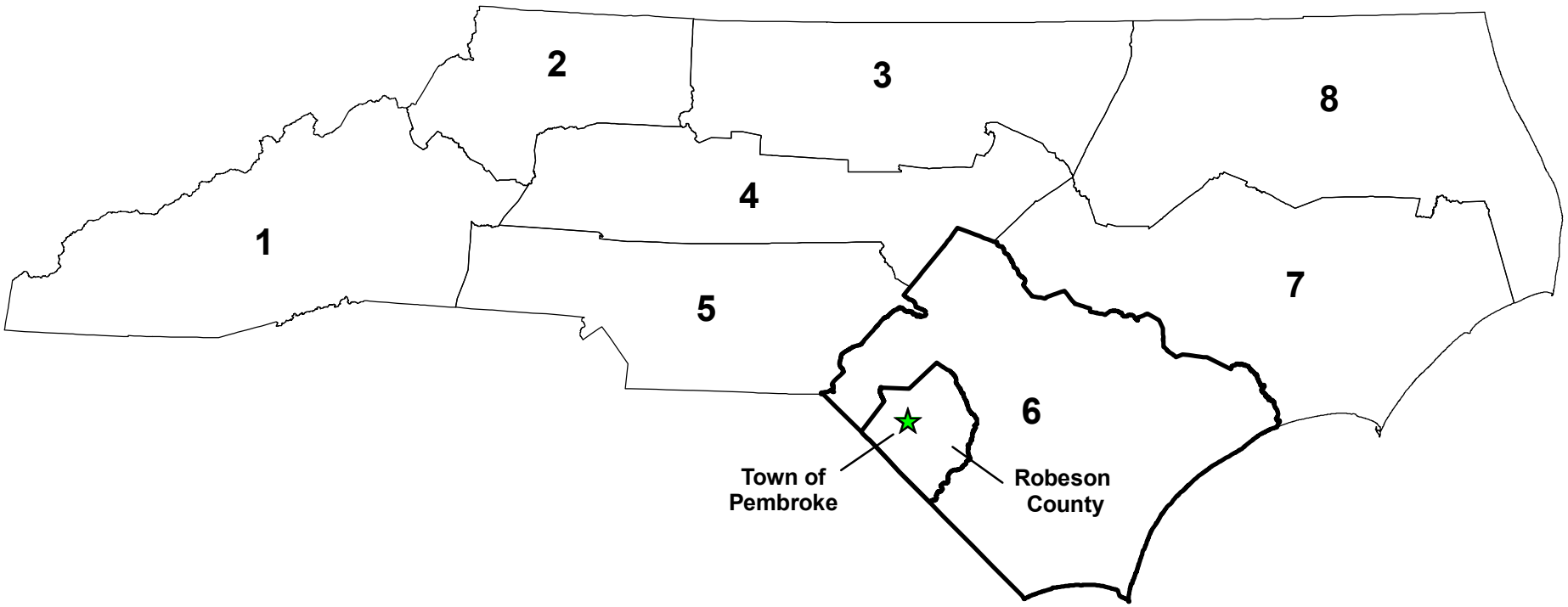
- **Hurricane:** Combination of general vulnerability areas and frequency of hurricanes, 1900-1996 by county. Climate divisions 6, 7, and 8 were assigned a "Mod." vulnerability, while climate divisions 1-5 were assigned a "Low" vulnerability. Then, if a county experienced any direct strikes from hurricanes between 1900 and 1996, it was assigned a "High" vulnerability.

- **Nor'easter:** Based on general vulnerability areas. Climate divisions 6, 7, and 8 were assigned a "Mod." vulnerability, while climate divisions 1-5 were assigned a "Low" vulnerability. Then, all counties on the coast were assigned a "High" vulnerability.

- **Tornado:** Combination of general vulnerability areas and frequency of tornadoes, 1953-1995 by county. Climate divisions 3-8 were assigned a "Mod." vulnerability, while climate divisions 1 and 2 were assigned a "Low" vulnerability. Then, all counties that experienced a frequency of tornado activity at or above the 75th percentile of the Southeast Regional Climate Center (SERCC) data set (number of tornadoes >6) were upgraded from "Mod." to "High" or "Low" to "Mod."

Map 2

North Carolina Climate Divisions



Climate Division 6 includes the following counties:
Bladen, Brunswick, Columbus, Cumberland, Duplin, Robeson, Sampson, and Scotland.

Source: North Carolina Division of Emergency Management, Local Hazard Mitigation Planning Manual

- **Severe Winter Weather:** Based on general vulnerability areas. For the potential for heavy snow, climate divisions 1 and 2 were assigned a "High" vulnerability, climate divisions 3 and 4 were assigned a "Mod." vulnerability, and climate divisions 5-8 were assigned a "Low" vulnerability. Then, all counties classified "Low" were upgraded to "Mod." if they fell within the region where cold air damming occurs in the eastern United States.

- **Wildfire:** Based on North Carolina State Forest Service records for number of wildfires by county and the number of acres burned, 1950-1993. Each of these data sets was categorized 1-3 (low to high). They were then averaged and rounded, with 1 = Low, 2 = Mod., and 3 = High.

- **Flood:** Flood vulnerability was assessed using several data sources. The United States Geological Survey (USGS) (1997b) provided average precipitation and surface runoff data for 1951-1980, which was of primary importance. Flash flood incidence for 1986-1995, provided by FEMA, was considered with hurricane threatened areas as secondary in importance. Finally, the threat of urban flooding was considered using 1996 county populations.

The following table categorizes vulnerability to those seven (7) types of natural hazards for all of the counties located within climate division 6.

Table 12
Natural Hazard Vulnerabilities for Counties within Climate Division 6

County	Climate Division (NOAA)	Earthquake	Hurricane	Nor'easter	Thunderstorm/ Tornado	Severe Winter Weather	Wildfire	Flood
Bladen	6	Low	Mod.	Mod.	Mod.	Low	Mod.	Mod.
Brunswick	6	Low	High	High	High	Low	High	High
Columbus	6	Low	Mod.	Mod.	High	Low	High	Mod.
Cumberland	6	Low	Mod.	Mod.	High	Low	High	High
Duplin	6	Low	Mod.	Mod.	High	Low	Low	Mod.
Harnett	6	Low	Mod.	Mod.	High	Low	Mod.	Mod.
Hoke	6	Low	Mod.	Mod.	Mod.	Low	Mod.	Mod.
New Hanover	6	Low	High	High	Mod.	Low	Mod.	High
Onslow	6	Low	High	High	High	Low	High	High
Pender	6	Low	High	High	High	Low	High	High

Table 12 (continued)

County	Climate Division (NOAA)	Earthquake	Hurricane	Nor'easter	Thunderstorm/ Tornado	Severe Winter Weather	Wildfire	Flood
Robeson	**6**	**Low**	**Mod.**	**Mod.**	**High**	**Low**	**High**	**High**
Sampson	6	Low	Mod.	Mod.	High	Low	Mod.	High
Scotland	6	Low	Mod.	Mod.	High	Low	Mod.	Mod.

Source: NC Division of Emergency Management, Local Hazard Mitigation Planning Manual.

Table 12 indicates that the Town of Pembroke is located in a county that is more vulnerable to hurricanes, nor'easters, thunderstorms/tornados, wildfires, and floods than to earthquakes, and severe winter weather. It is important that the Town of Pembroke understand the hazards that it is most susceptible to so that it can direct its mitigation efforts and resources toward the hazards which pose the greatest risk to town residents and property.

It is also important that policy makers understand the nature of each hazard and its likelihood of occurrence within their jurisdiction. In the following section, each natural hazard relevant to North Carolina will be described including discussions of its likelihood of occurrence and history of occurrence in Pembroke.

1. Hurricanes

a. Description

Hurricanes are cyclonic storms that originate in tropical ocean waters poleward of about 5° latitude. Basically, hurricanes are heat engines, fueled by the release of latent heat from the condensation of warm water. Their formation requires a low pressure disturbance, sufficiently warm sea surface temperature, rotational force from the spinning of the Earth, and the absence of wind shear in the lowest 50,000 feet of the atmosphere.

Hurricanes that impact North Carolina form in the so-called Atlantic Basin, from the west coast of Africa westward into the Caribbean Sea and Gulf of Mexico. Hurricanes in this basin generally form between June 1 and November 30, with a peak around mid-September. As a hurricane develops, barometric pressure at its center falls and winds

increase. Winds at or exceeding 39 mph result in the formation of a tropical storm, which is given a name and closely monitored by the NOAA National Hurricane Center in Miami, Florida. When winds are at or exceed 74 mph, the tropical storm is deemed a hurricane.

Because hurricanes derive their strength from warm ocean waters, they are generally subject to deterioration once they make landfall. The forward momentum of a hurricane can vary from just a few miles per hour to up to 40 mph. This forward motion, combined with a counterclockwise surface flow make the right front quadrant of the hurricane the location of the most potentially damaging winds.

Hurricane intensity is measured using the Saffir-Simpson Scale, ranging from 1 (minimal) to 5 (catastrophic). The following scale categorizes hurricane intensity linearly based upon maximum sustained winds, minimum barometric pressure, and storm surge potential.

- **Category 1:** Winds of 74 to 95 miles per hour. Damage primarily to shrubbery, trees, foliage, and unanchored mobile homes. No appreciable wind damage to other structures. Some damage to poorly constructed signs. Storm surge possibly 3 to 5 feet above normal. Low-lying roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings.

- **Category 2:** Winds of 96 to 110 miles per hour. Considerable damage to shrubbery and tree foliage; some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some roof, window, and door damage. No major wind damage to buildings. Storm surge possibly 6 to 8 feet above normal. Coastal roads and low-lying escape routes inland cut by rising water 2 to 4 hours before arrival of hurricane center. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying island areas required.

- **Category 3:** Winds of 111 to 130 miles per hour. Foliage torn from trees; large trees blown down. Practically all poorly constructed signs blown down. Some roof, window, and door damage. Some structural damage to small buildings. Mobile homes destroyed. Storm surge possibly 9 to 12 feet above normal. Serious

flooding at coast and many smaller structures near coast destroyed; larger structures near coast damaged by battering waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives.

- **Category 4:** Winds of 131 to 155 miles per hour. Shrubs and trees blown down; all signs down. Extensive damage to roofing materials, windows, and doors. Complete failure of roofs on many small residences. Complete destruction of mobile homes. Storm surge possibly 13 to 18 feet above normal. Major damage to lower floors of structures near shore due to flooding and battering by waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives. Major erosion of beaches.

- **Category 5:** Winds greater than 155 miles per hour. Shrubs and trees blown down; considerable damage to roofs of buildings; all signs down. Very severe and extensive damage to windows and doors. Complete failure of roofs on many residences and industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings overturned or blown away. Complete destruction of mobile homes. Storm surge possibly greater than 18 feet above normal. Major damage to lower floors of all structures less than 15 feet above sea level. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives.

b. Historical Impact

North Carolina has had an extensive hurricane history dating back to colonial times. During the nineteenth century, storms occurred in 1837, 1846, 1856, 1879, 1883, and 1899. During the 1950s, North Carolina was ravaged by several hurricanes, including Hazel, Connie, Diane, and Ione. Between 1960 - 1990, there was a decrease in landfalling hurricanes, with the exception of Hurricane Donna in 1960, Hurricane Ginger in 1971, Hurricane Diana in 1984, and Hurricane Hugo in 1989. Recent history has included several hurricanes as well, with Emily (1993), Opal (1995), Bertha (1996), Fran (1996), Bonnie (1998), Dennis (1999), Floyd (1999), and Isabel (2003) all leaving their mark on North Carolina. However, these storms had varying impacts on Pembroke. Following are brief descriptions of several storms which had a significant impact on the Town of Pembroke.

(1) October 5 to 18, 1954 (Hurricane Hazel)

Hurricane Hazel crossed the coast just north of Myrtle Beach, South Carolina, as hurricane winds hit the Atlantic coast between Georgetown, South Carolina, and Cape Lookout, North Carolina. Storm surge devastated the immediate ocean front of this stretch of coast. Every fishing pier along 170 miles of coast, from Myrtle Beach, South Carolina to Cedar Island, North Carolina, was destroyed. The waterfront between the South Carolina - North Carolina state line and Cape Fear was completely destroyed. Grass-covered dunes, some 20 feet high, along and behind which beach homes had been built in a continuous line 5 miles long, simply disappeared - dunes, houses, and all. From Cape Fear to Cape Lookout, the degree of devastation was not as great, but ocean front property was damaged an average of 50 percent along this entire stretch. North of Cape Lookout damage was relatively light.

Storm surge of 16.6 feet above National Geodetic Vertical Datum (NGVD) was observed at Holden Beach Bridge and Calabash, North Carolina. The lowest recorded barometric pressure of the storm was 938 millibars (mb), reported at Little River Inlet on the North Carolina - South Carolina border. Maximum wind speeds were 83 mph, with gusts recorded at 98 mph at Wilmington, North Carolina; 106 mph at Myrtle Beach, South Carolina; and 150 mph at Cape Fear. The storm continued inland through North Carolina causing widespread damage due to high winds and record rainfall. Nineteen people were killed and 200 injured during this storm. The total damage caused by Hazel in North Carolina was estimated at approximately $136 million.

(2) August 7 to 21, 1955 (Hurricane Diane)

Hurricane Diane struck the coast near Carolina Beach, NC around 6 a.m. on August 17. The highest wind speed reported during this storm was 74 mph at the Wilmington Airport. Storm tides ranged from 5 to 9 feet above mean low water on the beaches and in some areas of sounds and associated rivers, estimated water levels were 5 to 9 feet above normal. Diane caused severe beach erosion along the North Carolina coast. The total damage caused in North Carolina by Hurricanes Connie and Diane was estimated to be in excess of $90 million. No deaths or injuries in North Carolina were attributed to either of the storms.

(3) August 29 to September 13, 1960 (Hurricane Donna)

Hurricane Donna crossed the North Carolina coast between Wilmington and Morehead City on September 11. Wilmington was in the eye for about an hour. The lowest barometric pressure recorded during this storm was 962 mb at Wilmington. High tides, 6 to 8 feet above normal, together with high winds, caused severe damage in many areas. Winds of hurricane force, up to 97 mph, were reported from Wilmington.

During the night of September 11, the storm center moved northward, parallel and slightly east of a line drawn between Wilmington and Norfolk, Virginia. Wind gusts were in excess of 97 mph and tides were 4 to 8 feet above normal. Coastal communities from Wilmington to Nags Head suffered heavy structural damage and considerable beach erosion. Eight deaths and approximately 100 injuries were attributed to the storm. Damages were estimated at $25 million.

(4) September 9 to 14, 1984 (Hurricane Diana)

Diana was first observed as a developing low on the end of a frontal trough just north of the Bahama Islands September 8th. On September 9th, Diana approached within 150 miles of the Florida coast. On September 10th, Diana intensified to hurricane force and was moving north northeast on a course parallel to the Georgia and South Carolina coasts. Over the next two days (11th and 12th) Diana intensified to a Category 3 and moved close to Cape Fear. The hurricane stalled off Cape Fear for about 30 hours making an anticyclonic loop. Diana crossed the North Carolina coast near Long Beach as a minimal Category 2 hurricane around 3 am on September 13 during low tide. After making landfall, Diana weakened to tropical storm strength and then moved northeast along the coastal sections of North Carolina exiting into the Atlantic Ocean near Oregon Inlet.

Damage over southeast North Carolina amounted to around $80 million with about one third of that amount attributed to agricultural damage. The heavy rainfall in association with the winds caused widespread tree uprootings and months of clean-up work.

There were three deaths related to Diana: a person preparing for the storm suffered a fatal heart attack and two people were killed in accidents on water covered roads including the Shelter Manager in Brunswick County.

The highest sustained wind occurred while Diana was still out to sea. Oak Island Coast Guard Station on September 11th reported a sustained wind speed of 115 mph. When Diana made landfall, the highest sustained wind was around 92 mph.

(5) July 5 to July 12, 1996 (Hurricane Bertha)

Hurricane Bertha formed on July 5, 1996. As a Category One hurricane, Bertha moved across the northeastern Caribbean. The storm's highest sustained winds reached 115 mph north of Puerto Rico. Bertha made landfall near Wilmington on July 12 as a Category Two hurricane, with estimated winds of 105 mph. Bertha claimed two lives in North Carolina and did substantial damage to agriculture crops and forestland. Storm surge flooding and beach erosion were severe along the coast. Damages were estimated to exceed $60 million for homes and structures, and over $150 million for agriculture. Corn, tobacco, and other crops received severe damage from the storm. Rainfall totals of over 5 inches were common in eastern North Carolina.

(6) August 23 to September 5, 1996 (Hurricane Fran)

Hurricane Fran was the most destructive hurricane of the 1996 season. The storm was created on August 23, reaching hurricane status on August 29, while about 450 miles to the northeast of the Leeward Islands. It strengthened to a Category Three hurricane northeast of the central Bahamas on September 4. Hurricane Fran, with winds estimated at 115 mph, made landfall over Cape Fear on the evening of September 5, then continued northward over the eastern United States causing widespread damage. Fran was responsible for 34 deaths overall (24 in North Carolina alone), mostly caused by flash flooding in the Carolinas, Virginia, West Virginia, and Pennsylvania.

The storm surge on the North Carolina coast destroyed or seriously damaged thousands of beach front structures. Immediately following the storm, nearly 1.8 million people were without electrical power. Most electrical service was restored within 8-10 days. More than 890 businesses and 30,000 homes were damaged by a storm that also damaged or destroyed 8.25 million acres of forest. The damage in North Carolina alone was estimated at $5.2 billion.

Hurricane Fran was responsible for significant localized flooding within the Town of Pembroke. The problem results from deficiencies in the town's inadequate storm

drainage system. This problem was exacerbated by the severe rain that occurred during this storm.

(7) August 19 to 30, 1998 (Hurricane Bonnie)

Hurricane Bonnie originated as a tropical wave over Africa. It slowly increased speed and made its way across the Atlantic, near the Leeward Islands and then Hispaniola. It made landfall near Wilmington as a border Category 2/3 hurricane with approximately 115 mph winds and a diameter of 400 miles on August 27, 1998. Rainfall totals between 8-11 inches were recorded in portions of eastern North Carolina.

The storm slowly moved off land on August 28, 1998. In its wake, the total damage was estimated in the $1 billion range. There was an estimated $360 million in insured property damage, including $240 million in North Carolina alone. The insured losses do not include flooding and agricultural damages, which were extensive due to the vast amount of rain and high winds. There were trees down, roofs torn off, structural damage, and widespread power outages. North Carolina Governor Jim Hunt asked that the area be declared a natural disaster area. One 12-year old girl died in Currituck County as a result of Bonnie when a large tree fell on her home.

(8) August 24 to September 7, 1999 (Hurricane/Tropical Storm Dennis)

Hurricane Dennis developed over the eastern Bahamas on August 26, 1999, and drifted parallel to the southeastern United States from the 26th to the 30th. The center of Dennis approached to within 60 miles of the Carolina coastline on August 30th as a strong Category 2 hurricane. Although the storm never made landfall, rainfall amounts approached ten inches in coastal southeastern North Carolina and beach erosion was substantial. The highest peak gust reported in the State was 96 knots. Dennis made a return visit in September as a tropical storm, moving west-northwest through eastern and central North Carolina and then lingering off the coast for several days.

Although the damage directly attributed to Hurricane Dennis was not substantial in Pembroke, Dennis set the stage for Hurricane Floyd. The rainfall associated with Hurricane Dennis saturated the ground and raised the water table. As a result, when Hurricane Floyd hit North Carolina, its impact was intensified.

(9) September 7 to 18, 1999 (Hurricane Floyd)

Hurricane Floyd brought flooding rains, high winds, and rough seas to a good portion of the United States coastline from September 14th through the 18th. Although Hurricane Floyd reached Category 4 intensity in the Bahamas, it weakened to a Category 2 hurricane by the time it made landfall in North Carolina. Due to Floyd's large size, heavy rainfall covered a larger area and lasted longer than in a typical Category 2 storm. Flooding caused major problems across the region resulting in at least 77 deaths, and damages estimated in the billions. In North Carolina alone, 7,000 homes were destroyed, 17,000 homes were made inhabitable, and 56,000 homes were damaged.

(10) September 6 to 19, 2003 (Hurricane Isabel)

Hurricane Isabel began her path to the east coast of the United States as a tropical storm around September 6, 2003. On September 7th, Isabel was upgraded to a hurricane with 90 mile per hour (mph) sustained winds. By September 8th, Isabel became the third major hurricane of the year at a Category 4 with winds reaching almost 135 mph. Isabel continued her path towards the east coast with a well-formed eye and catastrophic winds that eventually reached 160 mph on September 11, 2003. According to the National Oceanic and Atmospheric Administration (NOAA), at that point Isabel's hurricane force winds extended 60 miles out from the center and tropical storm force winds extended approximately 185 miles out. The storm began to weaken and on September 16th was reduced to a Category 2. Large ocean swells and dangerous surf were experienced from South Carolina to New Jersey. The hurricane made landfall on September 19th along the southern Outer Banks. Widespread power outages were experienced in eastern North Carolina, other mid-Atlantic states, and the northeast. Storm surge was reported to be 6 to 8 feet above normal and created a new inlet near Cape Hatteras Village.

c. Likelihood of Occurrence

North Carolina's geographic location on the Atlantic Ocean and its proximity to the Gulf Stream make it prone to hurricanes. In fact, North Carolina has experienced the fourth greatest number of hurricane landfalls of any state in the twentieth century (trailing Florida, Texas, and Louisiana).

The Town of Pembroke is located in the coastal plain of eastern North Carolina. The town is approximately 100 miles from the Atlantic Ocean. The proximity of the town to the coast greatly increases the likelihood of occurrence for hurricanes. Based on historic information and the geographic location of the town, the likelihood of occurrence for hurricanes is "possible." The following provides a brief description of a tropical storm which had a significant impact on the town since adoption of the 2004 Pembroke Hazard Mitigation Plan.

(1) August 26 to September 3, 2004 (Tropical Storm Gaston)

Gaston made landfall the morning of August 29th as a tropical storm in Charleston County, SC. The storm moved north, through Georgetown, Williamsburg, and Florence counties. Gaston weakened to a tropical depression that night as it moved into Marion County and the remnants moved to Dillon County the morning of the 30th. In North Carolina, rainfall ranged from around an inch near the coast, to near five inches in Robeson County, with street flooding. The winds associated with Gaston were not much of a factor, with the peak wind of 58 mph recorded at the Springmaid Pier in Myrtle Beach. There were numerous limbs down, with some minor power outages. There was minor beach erosion reported at Bald Head Island and on the east side of Ocean Isle Beach. The effects of Gaston were felt weeks after, with widespread river flooding over the entire area. The Lumber river at Lumberton had record flooding, with a crest nearly eight feet above flood stage. There were several evacuations of homes in the Quinby area, and some flooding of farmlands in Pee Dee.

(2) Retired Names

Some hurricanes are so significant and have such a great impact on an area that the names are retired. The name of a hurricane may be retired if the country affected by the storm makes the request to the World Meteorological Organization (WMO). When the name is retired it may not be used again for at least ten years to avoid public confusion with other storms. Several of the hurricanes that affected the region were so destructive that their names were retired. The following is a list of those hurricanes: Hazel, Connie, Ione, Donna, Fran, Floyd, Isabel.

2. Thunderstorms and Tornadoes

a. Description

Thunderstorms are the result of convection in the atmosphere. They are typically the by-product of atmospheric instability, which promotes the vigorous rising of air parcels that form cumulus and, eventually, the cumulonimbus (thunderstorm) cloud.

A typical thunderstorm may be three miles wide at its base, rise to between 40,000 to 60,000 feet in the troposphere, and contain half a million tons of condensed water. Conglomerations of thunderstorms along cold fronts (with squall lines) can extend for hundreds of miles. Thunderstorms contain tremendous amounts of energy derived from condensation of water. Wind shears sometimes associated with thunderstorms can cause extensive property damage and power outages.

According to the National Weather Service, a severe thunderstorm is a thunderstorm which produces tornadoes, hail 0.75 inches or more in diameter, or winds >58 mph. However, the tornado is by far the greatest natural hazard threat from a severe thunderstorm.

The National Weather Service defines a tornado as a violently rotating column of air in contact with the ground and extending from the base of a thunderstorm. The intensity, path length, and width of tornadoes are rated according to a scale originally developed by T. Theodore Fujita and Allen D. Pearson in 1971. At the time Fujita derived the scale, little information was available on damage caused by wind, so the original scale presented little more than educated guesses at wind speed ranges for specific tiers of damage. Further research suggested that wind speeds for strong tornadoes on the Fujita scale were greatly overestimated, and on February 1, 2007, the Fujita scale was decommissioned (in the US only) in favor of what scientists believe is a more accurate Enhanced Fujita Scale. The EF Scale is thought to improve on the F-scale on many counts – it accounts for different degrees of damage that occur with different types of structures, both man-made and natural. The expanded and refined damage indicators and degrees of damage standardize what was somewhat ambiguous. It also is thought to provide a much better estimate for wind speeds, and sets no upper limit on the wind speeds for the strongest level, EF5. The Enhanced Fujita Scale is provided in Table 13.

Table 13. Enhanced Fujita Tornado Scale

Category	Wind Speed	Equivalent Saffir-Simpson Scale	Potential Damage
EF0	65-85 mph	N/A	Light Damage: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110 mph	Cat 1/2/3	Moderate Damage: Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135 mph	Cat 3/4/5	Considerable Damage: Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165 mph	Cat 5	Severe Damage: Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200 mph	Cat 5	Devastating Damage: Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200 mph	N/A	Explosive Damage: Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 feet; steel reinforced concrete structures badly damaged; high-rise buildings have significant structural deformation.

Source: National Oceanic and Atmospheric Administration.

b. Historical Impact

Between the years 1953-20039, 978 tornadoes were recorded in North Carolina, of which 29 were located within Robeson County, and one hit Pembroke directly in 1999. On average, Robeson County experienced one tornado approximately every 1.8 years during the 50-year period.

A comprehensive listing of tornado activity within Robeson County dating back to 1957 is provided in Appendix B.

According to the National Climatic Data Center, Robeson County experienced eighty-four hail storms from the early 1960s to 2004 that produced hail with diameters of 0.75" or greater. Four of those hail storms occurred in Pembroke. The county's soil survey reports that a large part of the rainfall during the growing season comes from summer thunderstorms.

c. Likelihood of Occurrence

Thunderstorms are common throughout North Carolina, and have occurred in all months. Thunderstorm-related deaths and injuries in North Carolina (1959-2009) have peaked during July and August. On average, 71% of North Carolina's tornadoes were classified as weak, 28% as strong, and about 1% as violent. Based on Southeast Regional Climate Center (SERCC) statistics, North Carolina ranks 22nd in total number of tornadoes and 18th in tornado deaths in the United States. for the period 1953-1995.

Although tornadoes have been reported in North Carolina throughout the year, most of them have occurred in the spring, with 13% in March, 11% in April, 22% in May, and 14% in June. Based on Worksheet #1, Pembroke is considered to have a "likely" likelihood of occurrence. Since adoption of the Town's 2004 Hazard Mitigation Plan, there have been 45 thunderstorms/windstorms, 24 hail events, and 9 tornadoes within Robeson County, resulting in three injuries and $1,019,000 in damages. Of these storms, six (6) events are reported as directly impacting the Town of Pembroke.

3. Flooding

a. Description

Flooding is a localized hazard that is generally the result of excessive precipitation. Floods can be generally considered in two categories: flash floods, the product of heavy localized precipitation in a short time period over a given location; and general floods, caused by precipitation over a longer time period and over a given river basin.

Flooding is the most common environmental hazard, due to the widespread geographical distribution of river valleys and coastal areas, and the attraction of residents to these areas.

Flash floods occur within a few minutes or hours of heavy amounts of rainfall or from a dam or levee failure. Flash floods can destroy buildings and bridges, uproot trees, and scour out new drainage channels. Most flash flooding is caused by slow-moving thunderstorms, repeated thunderstorms in a local area, or by heavy rains from hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urban areas where much of the ground is covered by impervious surfaces.

The severity of a flooding event is determined by a combination of river basin physiography, local thunderstorm movement, past soil moisture conditions, and the degree of vegetative clearing. Abnormal weather patterns may also contribute to flooding of a local area. Large-scale climatic events, such as the El Nino-Southern Oscillation in the Pacific have been linked to increased storm activity and flooding in the United States. Nationally, July is the month in which most flash flooding events occur, and nearly 90% of flash floods occur during the April through September period.

While flash floods occur within hours of a rain event, general flooding is a longer-term event, and may last for several days. The primary types of flooding are riverine flooding, coastal flooding, and urban flooding.

Periodic flooding of lands adjacent to non-tidal rivers and streams is a natural and inevitable occurrence. When stream flow exceeds the capacity of the normal water course, some of the above-normal stream flow spills over onto adjacent lands within the floodplain. Riverine flooding is a function of precipitation levels and water runoff volumes within the watershed of the stream or river. The recurrence interval of a flood is defined as the average time interval, in years, expected to take place between the occurrence of a flood of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

Floodplains are divisible into areas expected to be inundated by spillovers from stream flow levels associated with specific flood-return frequencies. The National Flood Insurance Program uses flood hazard zone designations to indicate the magnitude of flood hazards in specific areas. The following are flood hazard zones located within Pembroke and a definition of what each zone means.

- **Zone AE:** Special Flood Hazard Areas inundated by the 100-year flood; base flood elevations are determined.

Urban flooding occurs where there has been development within floodplains. This is partly a result of the use of waterways for transportation purposes in earlier times. The price of this accessibility was increased flooding in the ensuing urban areas. Urbanization increases the magnitude and frequency of floods by increasing impermeable surfaces, increasing the speed of drainage collection, reducing the carrying capacity of the land, and occasionally overwhelming sewer systems. This type of flooding has become a significant problem within the corporate limits of Pembroke.

b. Historical Impact

Ten percent (10%) of the town's planning jurisdiction is located in a flood hazard area. It should be noted however that only 0.5% of the corporate limits are within a flood hazard area. The Federal Emergency Management Agency (FEMA) maintains a database of properties for which two or more National Flood Insurance Program (NFIP) losses of at least $1,000 each have been paid within any 10-year rolling period since 1978 ("repetitive loss structures"). Currently, there are no repetitive loss properties within Pembroke.

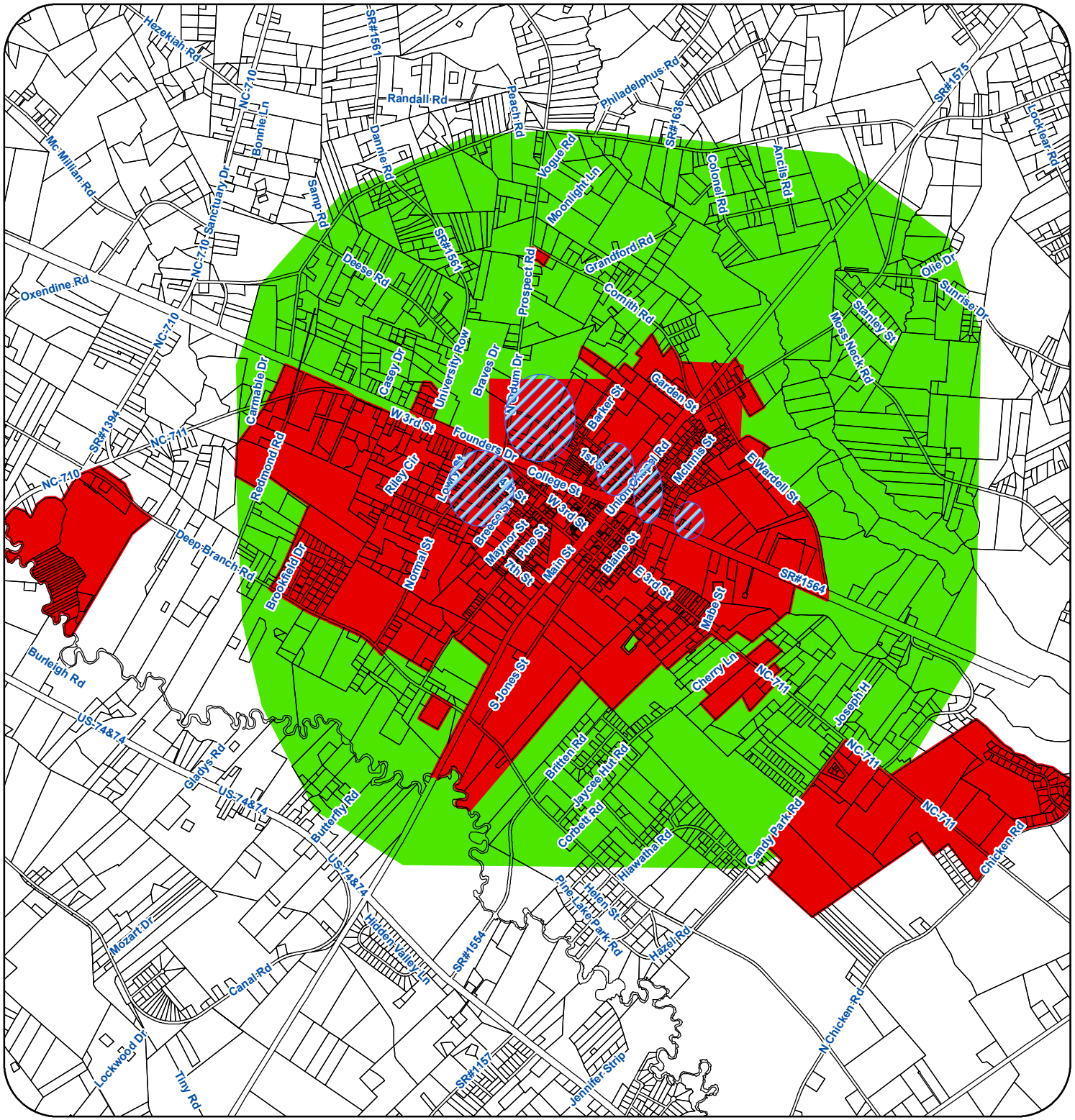
A history of flooding events associated with hurricanes was provided in the hurricane discussion of this section. The most significant problem for Pembroke with respect to flooding has been localized flooding. Localized flooding is defined as ponding of water within a defined area due to inadequate drainage. During Hurricane Fran in 1997, the town experienced significant problems with localized flooding. This problem still exists as evidenced by similar conditions resulting from Hurricane Isabel in 2003.

Over the last five years, the town has continued to experience issues relating to localized flooding. In an effort to better define the location of localized flooding within the town, the MAC was asked to provide the location of all stormwater "hot spots" as part of the update process. Map 3 provides the location of these areas. Additionally, the following photographs give an indication of the flooding issues that persist throughout portions of the town's corporate limits. This flooding can be attributed to poor drainage conditions, and the lack of a town-wide stormwater management system.

Map 3

Town of Pembroke Hazard Mitigation Plan

Stormwater Hot Spots



Legend

- Town Limits
- ETJ
- Robeson County Parcels

c. Likelihood of Occurrence

Flood hazard varies by location and type of flooding. Areas bordering rivers may be affected by large discharges caused by heavy rainfall over upstream areas. The Town of Pembroke is approximately 10 feet above mean sea level. According to the Soil Survey of Robeson County, NC, the area around Pembroke is drained mainly by the Lumber River and its tributaries. The dominant source of flooding is local ponding of stormwater runoff. As mentioned before, ten percent (10%) of the town's planning jurisdiction is located within a FEMA defined flood hazard area. Due to its geographical location along the Lumber River, Pembroke is susceptible to flooding. The likelihood of occurrence for flooding, based on Worksheet #1, is "possible."

4. Dam/Levee Failure

a. Description

According to the Dam Safety Law of 1967, a dam is defined as a structure erected to impound or divert water. This term is roughly synonymous with the term "levee" and these terms can be used interchangeably. Dams provide tremendous benefits, including water for drinking, power generation, and flood protection. At the same time, however, dams also represent a great risk to public safety, the environment, and local and regional economies when they fail. Flooding may result at many points along a watercourse when a dam failure occurs. Dams are dynamic structures that experience both internal and external changes in their conditions over time. Old pipes may deteriorate and continued development along rivers can cause more runoff. That runoff can result in the overtopping of dams. In addition, large storm events, such as hurricanes or severe thunderstorms, can overwhelm a dam's ability to function properly.

b. Historical Impact

According to "Success and Challenges: National Dam Safety Program 2002" completed in 2002 by the Association of State Dam Safety Officials, forty (40) dams failed in North Carolina following Hurricane Floyd in September of 1999 and over 100 dams overtopped, causing property damage and requiring evacuation of downstream areas to avoid loss of life and injury. The draft Statewide Risk Assessment for Natural Hazards reports that there were three major dam failures and twelve minor dam failures as a result of Hurricane Fran in 1996. None of these dam failures affected the Town of Pembroke.

c. Likelihood of Occurrence

The Town of Pembroke is located in the Lumber River Basin. According to data obtained from the North Carolina Dam Safety Program within the Division of Land Resources of the NC Department of Environmental and Natural Resources, there are 142 dams in the Lumber River Basin. NCGIA data lists, for each dam, the nearest town that would be affected if the dam were to experience a failure. Pembroke was identified as the nearest town to be affected by a dam failure to one dam located in the Lumber River Basin.

Table 14. Town of Pembroke
Dams - Pembroke as the Nearest Town to be Affected by a Failure

State ID Code	Dam Status	Last Inspection	Next Inspection	Purpose of Dam	Hazard Classification
ROBES-003	Exempt	1/2/2008	1/2/2013	Recreation	Low

Source: North Carolina Center for Geographic Information Analysis.

The only dam that will potentially affect Pembroke was last inspected in 2008, and will be inspected again in 2013. This dam is considered exempt. Exempt status means that a dam is not regulated by dam safety laws because of the size of the dam and/or a low hazard classification. This dam has a low hazard classification.

As of 2006, North Carolina has 1,148 "high hazard" dams – the largest number of "high hazard" dams in the United States according to ASCE National Infrastructure Report Card (2006). Another 764 dams in the State are classified as "intermediate hazard," meaning that significant property damage would occur in the event of a dam failure. Based on the hazard classification of dams that identify Pembroke as the nearest town to be affected, the likelihood of occurrence of a dam failure affecting Pembroke is "unlikely."

5. Nor'easters

a. Description

In the past decade, research meteorologists have recognized the significance of nor'easters and their potential to cause damage along the coast. Unlike hurricanes, these storms are extratropical, deriving their strength from horizontal gradients in temperature.

The presence of the warm Gulf Stream waters off the eastern seaboard during the winter acts to dramatically increase surface horizontal temperature gradients within the coastal zone. During winter offshore cold periods, these horizontal temperature gradients can result in rapid and intense destabilization of the atmosphere directly above and shoreward of the Gulf Stream. This period of instability often precedes wintertime coastal extratropical cyclone development.

It is the temperature structure of the continental air mass and the position of the temperature gradient along the Gulf Stream that drives this cyclone development. As a low pressure deepens, winds and waves can uninhibitedly increase and cause serious damage to coastal areas as the storm generally moves to the northeast. The proximity of North Carolina's coast to the Gulf Stream makes it particularly prone to nor'easters. The Dolan-Davis Nor'easter Intensity Scale categorizes nor'easters based upon levels of coastal degradation (see Table 15).

Table 15
The 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 channels	Extensive at regional-scale; millions of dollars

Source: NC Division of Emergency Management, Local Hazard Mitigation Planning Manual.

b. Historical Impact

A number of notable nor'easters have impacted North Carolina in recent decades, including the Ash Wednesday Storm of March 1962, but they were typically only of local concern. One exception to this was the nor'easter of late October and early November 1990, which loosened a dredge barge that struck and destroyed approximately five roadway segments of the Bonner Bridge in Dare County. Another nor'easter struck the Outer Banks on Halloween, 1991, causing substantial beach erosion. There is no record of any significant nor'easters impacting the Town of Pembroke.

c. Likelihood of Occurrence

Although nor'easters are more diffuse and less intense than hurricanes, they occur more frequently and cover larger areas and longer coastal reaches at one time. As a result, the likelihood of a nor'easter occurring in Pembroke is much higher than that of a hurricane. However, the potential for significant damage to the town resulting from a nor'easter is much less than that of a hurricane.

Analysis of nor'easter frequency by researchers reveals fewer nor'easters during the 1980s. However, the frequency of major nor'easters (class 4 and 5 on the Dolan-Davis scale) has increased in recent years. In the period 1987 to 1993, at least one class 4 or 5 storm occurred each year along the Atlantic seaboard of the United States, a situation duplicated only once in the last 50 years. The likelihood of occurrence, based on Worksheet #1, is "possible."

6. Severe Winter Storms

a. Description

Severe winter storms can produce an array of hazardous weather conditions, including heavy snow, blizzards, freezing rain and ice pellets, and extreme cold. Severe winter storms are extratropical cyclones fueled by strong temperature gradients and an active upper-level jet stream. The winter storms that impact North Carolina generally form in the Gulf of Mexico or off the southeast Atlantic Coast. Few of these storms result in blizzard conditions, defined by the presence of the winds in excess of 35 mph, falling and blowing snow, and a maximum temperature of 20 degrees Fahrenheit. While the frequency and magnitude of snow events are highest in the mountains due to the elevation, the geographical orientation of the mountains and Piedmont contribute to a regular occurrence of freezing precipitation events (e.g., ice pellets and freezing rain) in the Piedmont.

b. Historical Impact

There have been eleven (11) incidences of severe winter weather in Robeson County from 1993-2003. The county's soil survey reports that the average seasonal snowfall is four inches and that, on average, two days each year have at least one inch of snow on

the ground. The main effects of winter storms in Pembroke are immobility and frozen water pipes. The average daily minimum temperature is 34 degrees. It is important to note that extreme low temperatures could also be a hazard for Pembroke and do not necessarily occur during times of sleet and snow.

c. Likelihood of Occurrence

The entire State of North Carolina has a likelihood of experiencing severe winter weather. The threat varies by location and by type of storm. Coastal areas typically face their greatest threat from nor'easters and other severe winter coastal storms. These storms can contain strong waves and result in extensive beach erosion and flooding. Freezing rain and ice storms typically occur once every several years at coastal locations, and severe snowstorms have been recorded occasionally in coastal areas.

It is significant that when winter weather hits Pembroke, it has the potential of being severe. In 1997, FEMA commissioned the National Climatic Data Center (NCDC) to compile snowfall extreme statistics for the contiguous United States. One-day observed maximum total snowfall amounts (in inches) were compiled and consolidated by town. Out of the eight (8) total climate divisions in North Carolina, the Town of Pembroke's climate division (#6) ranked last in terms of average one-day extreme snowfall. Table 16 provides a summary of average one-day extreme snowfall for each North Carolina climate division.

Table 16
Extreme Average Snowfall by Climate Division

Climate Division*	Average (Inches)	Climate Division*	Average (Inches)
1	14.39	5	11.62
2	15.06	6**	10.69
3	11.62	7	12.38
4	11.56	8	12.24

*See Map 2 for a delineation of climate divisions.
**Includes the Town of Pembroke.
Source: NC Division of Emergency Management, Local Hazard Mitigation Planning Manual.

The data above suggests that the mountains have the highest extreme one-day snowfall. The likelihood of occurrence for a severe winter storm is "possible." Since adoption of the Town's 2004 Hazard Mitigation Plan, there have been several incidences of severe winter weather. Table 17 provides a summary of these snow and ice events.

Table 17. Robeson County
Severe Winter Weather, 2004 -2009

Event	Date	Deaths	Injuries	Damages (Property)
Ice Storm	1/25/2004	0	0	2.5M
Ice Storm	1/26/2004	0	0	13.0M
Winter Storm	2/26/2004	0	0	0
Winter Weather/Mix	2/17/2004	0	0	0
Winter Weather/Mix	12/26/2004	0	0	30K
Frost/Freeze	4/8/2007	0	0	0
Heavy Snow	1/20/2009	0	0	0

Source: National Oceanic and Atmospheric Administration.

7. Wildfire

a. Description

A wildfire is an uncontrolled burning of grasslands, brush, or woodlands. The potential for wildfire depends upon surface fuel characteristics, recent climate conditions, current meteorological conditions, and fire behavior. Hot, dry summers and dry vegetation increase susceptibility to fire in the fall, a particularly dangerous time of year for wildfire.

While natural fires occur in any area in which there is vegetation, flammability varies by species, moisture content, and is influenced by the climate. Temperate, primarily deciduous forests, such as those in North Carolina, are most vulnerable to fire in autumn, when the foliage dries out. Grasses are least prone to ignition in the morning, when their moisture content is greatest.

Many wildfires have been caused by lightning strikes; however, humans are the greatest cause of wildfires. The progressive expansion of human activities into heavily vegetated areas has not only increased the number of wildfires but also increased the losses to life and property. The majority of fires which threaten life and property have been due to human actions. Main sources of ignition have been agricultural fires, discarded cigarette butts, and campfires which have gotten out of control.

b. Historical Impact

According to the Division of Forest Resources, in 2008, forty-six percent (46%) of Robeson County consisted of forestland. Ninety-two percent (92%) was privately-owned and eight percent (8%) was owned by the forest industry. In 2008, there were 118 wildfires in Robeson County. Sixty-four percent (64%) of these fires were incendiary; twenty-three percent (23%) were from debris; three percent (3%) were caused by children; six percent (6%) were classified as miscellaneous; one percent (1%) were caused by lightning; and three percent (3%) were caused by smoking. Since the Town of Pembroke is quite urbanized, the impact of wildfires has been relatively low.

c. Likelihood of Occurrence

In North Carolina, wildfire potential has been assessed using State Forest Service records for the period 1950-1993. Counties were classified as High (score of 3), Moderate (score of 2), or Low (score of 1) depending on their rank, for both number of fires and number of acres burned. The scores for both of these statistics were then added to generate a combined classification. The combined scores ranged from a low of 2 to a high of 5. Robeson County's combined score was a 2 indicating a low probability of occurrence. Based on the preceding information and since the town is quite urbanized, the likelihood of occurrence for wildfires in Pembroke is "unlikely."

8. Earthquakes

a. Description

Earthquakes are geologic events that involve movement or shaking of the Earth's crust. Earthquakes are usually caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth's outer crust. These fault planes generally follow the outlines of the continents.

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, 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 244-fold increase in energy. Intensity is most commonly measured using

the Modified Mercalli Intensity (MMI) Scale. It is a twelve-level scale based on direct and indirect measurements of seismic effects. The scale levels are typically described using roman numerals. Table 18 provides a summary of the Modified Mercalli Scale of Earthquake Intensity and its relation to the Richter Scale.

Table 18
Modified Mercalli Scale of Earthquake Intensity

Scale	Intensity	Description of Effects	Maximum Acceleration (mm/sec)	Corresponding Richter Scale
I	Instrumental	Detected only on seismographs	<10	
II	Feeble	Some people feel it	<25	<4.2
III	Slight	Felt by people resting; like a truck rumbling by	<50	
IV	Moderate	Felt by people walking	<100	
V	Slightly Strong	Sleepers awake, church bells ring	<250	<4.8
VI	Strong	Trees sway; suspended objects swing; objects fall off shelves	<500	<5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls	<1000	<6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures; poorly constructed buildings damaged	<2500	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	<5000	<6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	<7500	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	<9800	<8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	>9800	>8.1

Source: Local Hazard Mitigation Planning Manual, NC Division of Emergency Management.

b. Historical Impact

Earthquakes are relatively infrequent but not uncommon in North Carolina. The earliest North Carolina earthquake on record is that of March 8, 1735, near Bath. It is likely that this earthquake was less than Intensity V (slightly strong; sleepers awake). During the

great earthquake of 1811 (Intensity VI), centered in the Mississippi Valley near New Madrid, Missouri, tremors were felt throughout North Carolina. The most property damage in North Carolina ever attributed to an earthquake was caused by the August 31, 1886, Charleston, South Carolina shock. The quake left approximately 65 people dead in Charleston and caused chimney collapses, fallen plaster, and cracked walls in Abbottsburg, Charlotte, Elizabethtown, Henderson, Hillsborough, Raleigh, Waynesville, and Whiteville. On February 21, 1916, the Asheville area was the center for a large intensity VI earthquake, which was felt in Alabama, Georgia, Kentucky, South Carolina, Tennessee, and Virginia. Subsequent minor earthquakes have caused damage in North Carolina in 1926, 1928, 1957, 1959, 1971, 1973, and 1976. There is no history of damage in Pembroke resulting from earthquakes.

c. Likelihood of Occurrence

In North Carolina, earthquake epicenters are generally concentrated in the active Eastern Tennessee Seismic Zone. The Eastern Tennessee Seismic Zone is part of a crescent of moderate seismic activity risk extending from Charleston, South Carolina northwestward into eastern Tennessee and then curving northeastward into central Virginia. While there have been no earthquakes with a MMI intensity greater than IV since 1928 in this area, it has the potential to produce an earthquake of significant intensity in the future.

North Carolina's susceptibility to earthquakes decreases from west to east in relation to the Eastern Tennessee Seismic Zone. Generally, there are three different zones of seismic risk in North Carolina. The eastern portion of the State faces minimal effects from seismic activity. Locations in the middle and southeastern areas of the State face a moderate hazard from seismic activity, while the area from Mecklenburg County west through the Blue Ridge faces the greatest risk from seismic activity. These different levels of risk correspond to proximity to areas with historical seismic activity and changes in topography.

The Town of Pembroke is located in the portion of North Carolina that is less susceptible to the effects of earthquakes. The likelihood of occurrence for earthquakes is "unlikely."

9. Sinkholes

a. Description

A sinkhole is a depression or hole in the ground caused by a collapse of the ground's surface. Sinkholes are usually associated with Karst topography, which is a maze of underground caves, caverns, and aquifers. Sinkholes vary in size with the impact being largely contained to the area of the sinkhole itself. However, the impact of the sinkhole on groundwater is much larger. If the area where the sinkhole occurs is contaminated or polluted in any way, the sinkhole offers an ideal place for the pollution to enter the groundwater.

According to the USGS, sinkholes typically occur in areas having limestone, carbonate rock, salt beds, or rocks easily dissolved by water. Sinkholes have also been known to occur above abandoned mines, in areas that have experienced a drought, and they are occurring more frequently in areas experiencing rapid growth. Altering the drainage in an area and groundwater pumping often times lowers local and regional groundwater levels to the extent that it causes a sinkhole.

b. Historical Impact

There is no history of sinkholes in the Town of Pembroke.

c. Likelihood of Occurrence

The USGS reports that most of the damage that occurs as a result of sinkholes occurs in the states of Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. The geology of these states lends themselves to the likelihood of a sinkhole occurrence. The Town of Pembroke is located in Robeson County, part of the coastal plain of North Carolina. Based on the North Carolina Geologic Survey, Pembroke consists of sand, clay, and limestone fossils and is not consistent with the geology associated with sinkholes. The likelihood of occurrence for sinkholes is "unlikely."

10. Droughts/Heat Waves

a. Description

The National Drought Mitigation Center (NDMC) generally defines a drought as a hazard of nature that is a result of a deficient supply of precipitation to meet the demand. Droughts occur in all types of climate zones and have varying effects on the area experiencing the drought. Droughts tend to be associated with heat waves. An extended drought period may have economic impacts (agriculture, industry, tourism, etc.), social impacts (nutrition, recreation, public safety, etc.), and environmental impacts (animal/plant, wetland, and water quality).

NDMC also reports that droughts are related to the balance between precipitation and evapotranspiration or to the timing of seasonal occurrences such as rainy seasons. Often times, development and human involvement aggravates the impact of droughts. Planning for droughts has become increasingly more important. Thirty-eight states have some type of drought plan in place. North Carolina is one of those states with a drought plan focusing on response.

b. Historical Impact

In 1965, a National Weather Service Meteorologist by the name of Wayne Palmer created a sophisticated system for measuring droughts. The name given to this system is the Palmer Drought Severity Index (PDSI). It measures drought in the United States as far back as 1895. According to the PDSI data by decade, since 1950, the area in which Pembroke is located has experienced severe or extreme drought less than ten percent of the time. Robeson County experienced drought conditions three (3) times from 1999-2002. There is no further data available regarding drought or heat waves within Pembroke's jurisdiction.

c. Likelihood of Occurrence

It is difficult for scientists to predict when droughts will occur. They are dependent upon the accurate forecasting of precipitation and temperature. Precipitation is a very important component of water supply and studying historic precipitation data and the area's climate can provide an idea of the potential for drought. The Soil Survey of

Robeson County, North Carolina states that water is plentiful throughout the county and precipitation occurs throughout the year. Annual precipitation is approximately 46 inches with a large part of the rainfall during the growing season coming from summer thunderstorms. Droughts can occur in Pembroke but as mentioned above they are difficult to predict. Since the adoption of the Town's 2004 Hazard Mitigation Plan, Robeson County has experienced eight (8) significant drought events. In light of the climate in the area, the likelihood of occurrence is "unlikely."

11. Explanation of Hazards Not Identified

The following hazards were not identified within the context of this document for the reasons indicated.

Hazard	Why Not Identified
Landslides	There is no history of landslides in Pembroke.
Tsunamis	There is no history of tsunamis in Pembroke.
Volcanoes	There has been no record of any volcanic activities within the proximity of Pembroke in recent geologic time.

12. Hazard Damage and Likelihood of Occurrence Summary

The following worksheet provides an estimate of damage potential and likelihood of occurrence based on the preceding sections. All factors were taken into account when filling out these tables including: input from town staff members, data documenting historical occurrences, and instances of storms impacting the region since the last Hazard Mitigation Plan Update in 2004.

WORKSHEET #1: HAZARD IDENTIFICATION AND ANALYSIS

Type of Hazard & Associated Elements *	Likelihood of Occurrence[1] (Highly Likely, Likely, Possible, Unlikely)	Intensity Rating[2] (Intensity Scales or Relative Terms)	Potential Impact[3] (Catastrophic, Critical, Limited, Negligible)	Hazard Ranking[4] (1-3 scale with 1 being the greatest priority)
Hurricanes	Possible	Severe	Critical	1
Thunderstorms/ Tornados	Likely	Moderate	Negligible	1
Flooding	Possible	Severe	Critical	1
Dam/Levee Failure	Unlikely	Mild	Negligible	2
Nor'easters	Possible	Moderate	Limited	2
Severe Winter Storms	Possible	Moderate	Negligible	2
Wildfire	Unlikely	Moderate	Negligible	3
Earthquakes	Unlikely	Mild	Negligible	3
Sinkholes	Unlikely	Mild	Negligible	3
Drought/Heat Waves	Unlikely	Mild	Negligible	3

* Tsunamis were not factored into this analysis due to their low likelihood of occurrence.

NOTES:

[1] Likelihood of occurrence was estimated using historic data and the following chart:

Likelihood	Frequency of Occurrence
Highly Likely	Near 100% probability in the next year
Likely	Between 10 and 100% probability in the next year, or at least one chance in the next 10 years
Possible	Between 1 and 10% probability in the next year, or at least one chance in the next 100 years
Unlikely	Less than 1% probability in the next year, or less than one chance in the next 100 years

[2] The hazard's intensity was estimated using historic data and various standardized scales.

[3] The potential impact was estimated by considering the magnitude of the event, how large an area within the community is affected, and the amount of human activity in that area, then using the following chart as a tool:

Level	Area Affected	Impact
Catastrophic	More than 50%	• Multiple deaths • Complete shutdown of facilities for 30 days or more • More than 50 percent of property is severely damaged
Critical	25 to 50%	• Multiple severe injuries • Shutdown of critical facilities for 1-2 weeks • More than 25 percent of property is severely damaged
Limited	10 to 25%	• Some injuries • Shutdown of some critical facilities 24 hours to one week • More than 10 percent of property is severely damaged
Negligible	Less than 10%	• Minor injuries • Minimal quality-of-life impact • Shutdown of some critical facilities and services for 24 hours or less • Less than 10 percent of property is severely damaged

[4] Hazards were assigned a 1 if the likelihood of occurrence was "likely" or if the likelihood of occurrence was "possible" with a moderate or higher intensity rating and a limited or higher impact rating. All other hazards with a "possible" likelihood of occurrence designation were assigned a two. Hazards were assigned a 3 if it was determined that the likelihood of occurrence was "unlikely."

SECTION 3: VULNERABILITY ASSESSMENT

A. Introduction

Vulnerability to a natural hazard is defined as the extent to which people experience harm and property damage from a hazard. Hazards may result in loss of life or injury to people; loss of or damage to homes, businesses, and industries; loss or damage to automobiles, furnishings, records, and documents; damages or interruptions to power and telephone lines; damage or closing of roads, railroads, airports, and waterways; and general disruption of life. It is important to know where and to what extent a community is susceptible to the impacts of natural hazards. To fully understand the extent of Pembroke's vulnerability, it is necessary to know what is currently at risk and what could be at risk if growth and development occur as is currently permitted.

B. Major Physical Features

The Town of Pembroke is centrally located in Robeson County in the coastal plains of eastern North Carolina. The town is located in the Lumber River Basin adjacent to the Lumber River. NC Highway 711 is the only major east-west highway traversing the town; however, US Highway 74 runs east-west roughly 3 miles south of Pembroke. The Highway 74 corridor is currently under construction to be designated as an Interstate highway. This stretch will be a major corridor connecting Wilmington on the coast with the Charlotte Metropolitan Area. The Town of Pembroke is located approximately 107 miles southeast of Raleigh and 88 miles west of the Wilmington. See Map 1 on page 2 for a regional location map.

The corporate limits and extraterritorial jurisdiction (ETJ) encompass 5,075.76 acres, or 7.93 square miles. There are 1,808.27 acres in the corporate limits and 3,267.49 acres in the ETJ. These figures include the right-of-ways. Pembroke's planning jurisdiction is broken down into eight zoning districts. There are three residential zoning districts, three commercial zoning districts, one office and institutional zoning district, and one industrial zoning district. Table 19 provides definitions for the zoning districts. Table 20 lists the zoning districts and number of parcels and acres within each district for the town's corporate limits. The town has recently gone through the process of developing a unified development ordinance. As part of this process, the town's zoning districts have been redefined as reflected in Table 19. Almost seventy-six percent (76%) of

parcels have been assigned a residential zoning district. Six percent (6%) have been assigned a commercial zoning district, six percent (6%) of parcels have an office and institutional zoning class, and ten percent (10%) have an industrial zoning classification. Map 4 delineates the zoning districts within the Town of Pembroke's corporate limits.

Table 19. Town of Pembroke
Zoning District Descriptions

Zoning District	Definition
R-20 Residential	Established as a district in which the principal use of land is for very low residential density and agricultural purposes. The regulations of this district are intended to protect the agricultural sections of the community from an influx of uses likely to render them undesirable for farms and future, and to ensure that residential developments dependent upon private wells and septic tanks will occur at sufficiently low densities to ensure a healthful environment.
R-10 Residential	Established in which the principal uses of land are for single-family and two-family residences. The regulations of this district are intended to foster medium residential development, and to stabilize existing residential areas by limiting the occurrence of conflicting uses in such residential areas, to prevent unduly dense development in areas not receiving any or only partial public or semi-public water services, and to enhance the prospects for future residential development in an orderly manner.
R-8 Multiple-family Dwelling	The purpose of this district is to create and protect areas in which residential, two-family dwelling (duplex) and multi-family dwelling uses can be and are compatible through their proper arrangement to achieve a healthful living environment for the residents of the district while at the same time preventing the development of blight and slum conditions. This district is limited to those sections of the community in which the mixing of such uses has been found necessary and desirable for the buffering of residential or commercial or industrial uses, or for the maintenance or creation of an area compatible and useful with the adjoining areas to the end that the buildings will be located and constructed in a manner which reflects an appropriate appearance and aesthetic taste.
O&I Office and Institutional	This district is established primarily for office and institutional uses which have limited contact with the general public and which cause no offensive noises, odors, smoke, fumes or other objectionable conditions. This district is usually adjacent to the residential districts. Provisions are made for yards, buffers, off-street parking, and off-street loading.
C-1 Central Business District	This district is designed to accommodate those retail and office uses which are characteristic of the major business center of the town.
C-2 Neighborhood Business District	This district is established in which the principal use of land is for commercial and service uses to serve the surrounding residential districts.
C-3 Highway Business District	This district is intended for the use of those businesses that are properly and necessarily located along major highways. Business uses permitted in this district are those retail and service facilities that provide goods and services for the traveling public.

Table 19 (continued)

Zoning District	Definition
I Industrial	This district is intended for location of warehousing, mixed industrial-heavy commercial type uses. The purpose is to promote and protect both existing industrial activities and potential sites where urban services are available and which are considered suitable for continued or future industrial use; to prohibit uses of land which would substantially interfere with the continuation of uses permitted in the district; and to promote the operation of well planned and maintained industrial facilities.
OS Open Space	This district is established in which the primary use of land is predominantly reserved for flood control, public recreation, community facility site, natural or man-made bodies of water, forests, and other similar open space uses. The specific intent of this district is as follows: (1) to encourage the preservation of, and continued use of, the land for conservation purposes; (2) to prohibit residential, commercial, and industrial use of the land, and to prohibit any other use which would substantially interfere with the preservation of this district; and (3) to encourage the discontinuance of uses that would not be permitted as uses in the district.

Source: Town of Pembroke Unified Development Ordinance.

Table 20. Town of Pembroke
Zoning Districts and Acreages

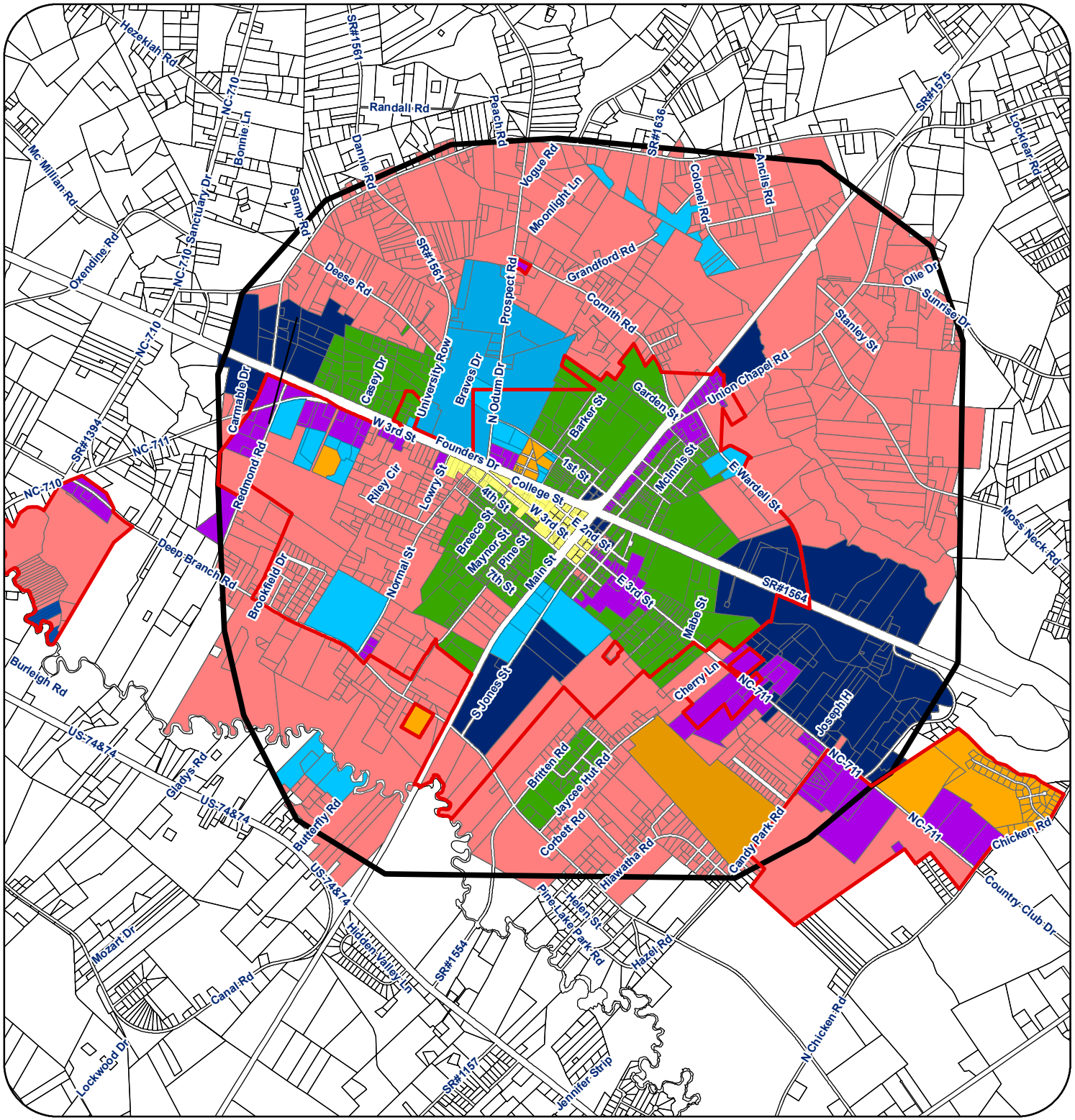
Zoning Class	Acres	Percentage
Residential Districts		
R8	219.3	4.3%
R10	574.2	11.3%
R20	3,061.5	60.3%
Business Districts		
C1	33.0	0.7%
C3	287.8	5.7%
Industrial District		
I	531.0	10.5%
Office & Institutional District		
O&I	308.0	6.0%
OS	61.1	1.2%
TOTAL	5,076.0	100.0%

Source: Town of Pembroke and Holland Consulting Planners, Inc.

Map 4

Town of Pembroke Hazard Mitigation Plan

Zoning



Legend

- Town Limits
- ETJ
- Robeson County Parcels

Zoning

- C1
- C3
- Industrial
- OI
- OS
- R10
- R20
- R8

N
W
E
S

1 inch = 2,975 feet

0 0.15 0.3 0.6 0.9 1.2 Miles

C. Development Vulnerability

At the time the 2004 Pembroke Hazard Mitigation Plan was drafted, there was a significant deficiency with respect to geographic information system data. This deficiency resulted in a vulnerability analysis that lacked detailed information regarding existing as well as projected development characteristics throughout the town's planning jurisdiction. Over the last five years, several steps have been taken that will enable the town to provide a more meaningful discussion with this update.

In 2005 Robeson County completed the development of a comprehensive tax parcel mapping project. This effort provides the County and all municipalities with a detailed GIS inventory of all property including land values, building values, and property owner information. Additionally in 2005, the Town of Pembroke utilized this information to conduct a detailed existing land use inventory. This land use inventory was incorporated into a land use plan that was adopted by the town in May of 2005. Table 21 below provides a summary of land use conditions that exist as of the drafting of this update. The land use inventory, compiled in 2005, has been updated to accurately reflect 2009 conditions.

Table 21. Town of Pembroke
Existing Land Use

	Corporate Limits		ETJ	
Land Use Class	Acres	Percentage	Acres	Percentage
Residential				
AG-RES	1.59	0.09%	493.31	15.10%
MF	85.42	4.72%	0.00	0.00%
RES	382.64	21.16%	676.29	20.70%
MHP	11.28	0.62%	8.21	0.25%
Subtotal	*480.93*	*26.60%*	*1,177.81*	*36.05%*
Business				
COM	208.93	11.55%	16.53	0.51%
IND	29.17	1.61%	36.20	1.11%
Subtotal	*238.10*	*13.17%*	*52.73*	*1.61%*
Office & Institutional				
OI	106.32	5.88%	148.07	4.53%
Public				
REC	42	2.32%	0	0.00%
UTIL	35.34	1.95%	12.41	0.38%
Subtotal	*77.34*	*4.28%*	*12.41*	*0.38%*
VACANT	905.58	50.08%	1876.47	57.43%
Total	**1808.27**	**100.00%**	**3267.49**	**100.00%**

Source: Town of Pembroke and Holland Consulting Planners, Inc.

1. Developed Land

The Town of Pembroke was originally developed based on agriculture and commerce serving the Lumbee Indian Tribe. Development started in the downtown and radiated out along major roads. More recent development has been occurring along the commercial corridors. Map 5 provides areas of anticipated growth for the Town of Pembroke. Following is a description of the development around Pembroke.

a. Residential

Older, denser neighborhoods are found near the downtown area or stretched in more linear fashion along the main streets. There has been some significant new single-family development, some of which has been in-fill or located in the more peripheral areas. Most of the new development has occurred in the eastern portion of town running along NC Highway 711. Typically, neighborhoods are situated on smaller lots and contain a greater variety of dwelling types as well as some ancillary non-residential uses.

Large multi-family structures, such as apartments and townhouses, are located along major thoroughfares, and are primarily utilized by the college age population. Smaller multi-family structures, such as duplexes and rooming houses, can also be found throughout town.

b. Commercial

Commercial activity in Pembroke is concentrated in several areas, most notably in the downtown core or along major arterials. Although highway commercial uses have become more prevalent in recent years, the downtown area still accounts for a significant share of the town's total commercial acreage.

Two major areas of general commercial use extend outward from the central business district running eastward along NC Highway 711. A few other commercial uses occur in scattered locations throughout town. Some of this commerce includes services and retailing operations located adjacent to the UNCP campus. Heavier types of commercial use, such as auto repair shops and outdoor equipment centers, also exist in proximity to residential areas and are less compatible with the surrounding neighborhoods.

c. Industrial

Industrial uses within the town are scattered throughout the town's planning jurisdiction. Industrial operations within the Town of Pembroke are light industrial, thus reducing any adverse impacts on adjacent properties.

d. Office and Institutional

Office and institutional land uses within Pembroke are generally utilized for municipal operations and the University of North Carolina Pembroke. The town operates a public library, public works operations center, municipal building, a public park, and a sewer treatment plant. The UNCP campus is by far the town's largest employer. The campus is the fastest growing university in the North Carolina System, and Pembroke overall will continue to grow and prosper as a result of this facility.

e. Extraterritorial Jurisdiction Area

The extraterritorial jurisdiction (ETJ) area extends from the present corporate limits outward for approximately one mile on the town's east and north sides, and roughly 0.75 mile to the south. The ETJ area encompasses approximately 5.1 square miles, which consists primarily of open space/farmland with scattered residential and commercial development.

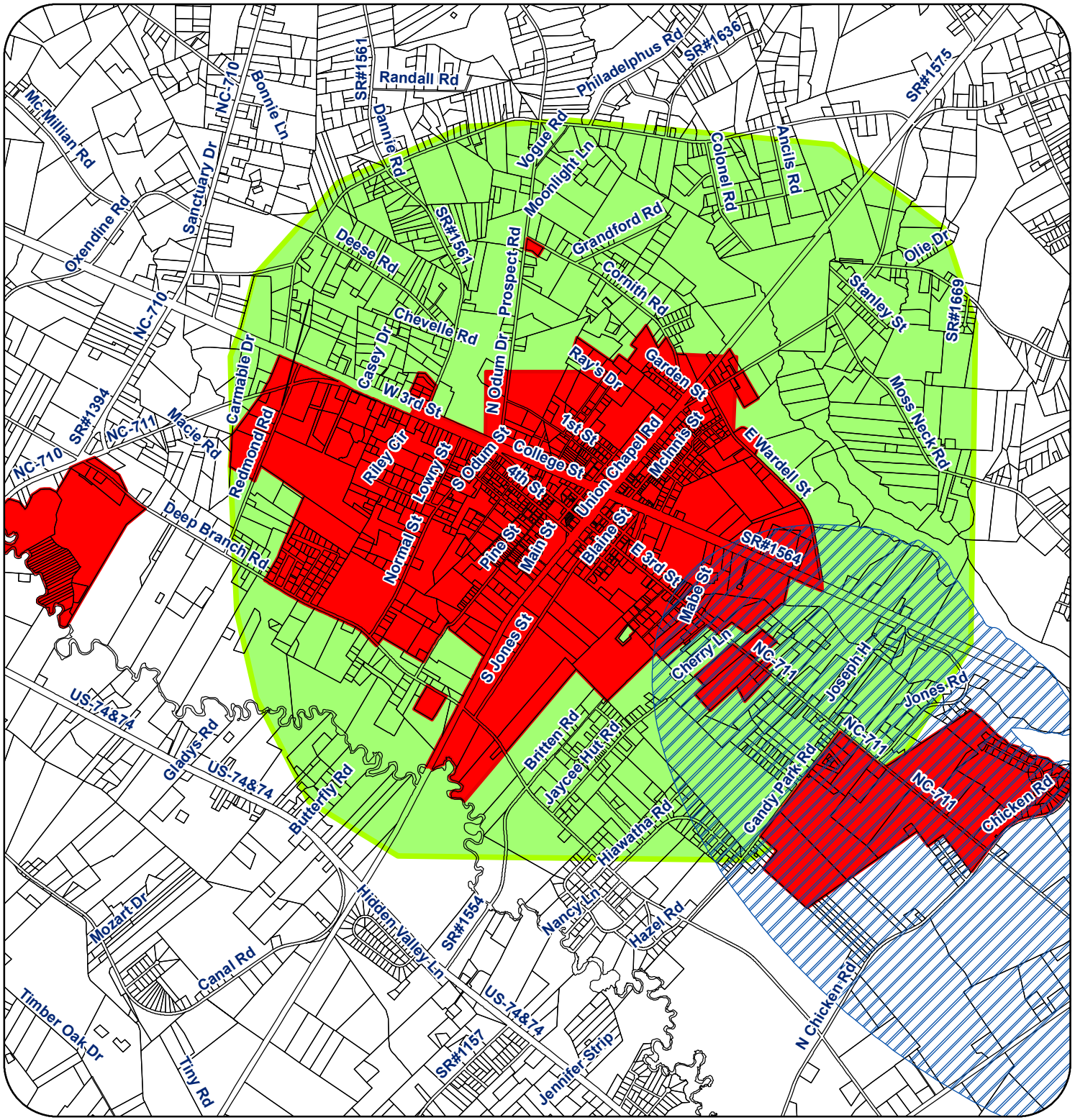
2. Undeveloped Land

As noted, the Town of Pembroke now has a detailed existing land use survey. This information has enabled the town to accurately determine the number of acres and location of all undeveloped land within the Town's planning jurisdiction. Based on this inventory, there are 2,782.02 acres of undeveloped land within the town and its ETJ. This land is predominantly located within the ETJ, and is comprised of underutilized agricultural tracts. There are also a number of undeveloped parcels scattered throughout the town's corporate limits.

Map 5

Town of Pembroke Hazard Mitigation Plan

Areas of Anticipated Growth



1 inch = 2,975 feet

0 0.15 0.3 0.6 0.9 1.2 Miles

D. Fragile Areas

In coastal North Carolina, fragile areas are considered to include coastal wetlands, ocean hazard areas, shorelines, estuarine waters and shorelines, sound and estuarine islands, public trust waters, natural heritage areas, areas sustaining remnant species, unique geological formations, registered natural landmarks, swamps, prime wildlife habitats, areas of excessive slope, areas of excessive erosion, scenic points, archaeological sites, historical sites, and 404 wetlands. Map 6 provides a delineation of Areas of Environmental Concern (AEC) within Pembroke. These areas could easily be damaged or destroyed by inappropriate or poorly planned development. The following fragile areas are found within Pembroke.

1. Freshwater Wetlands

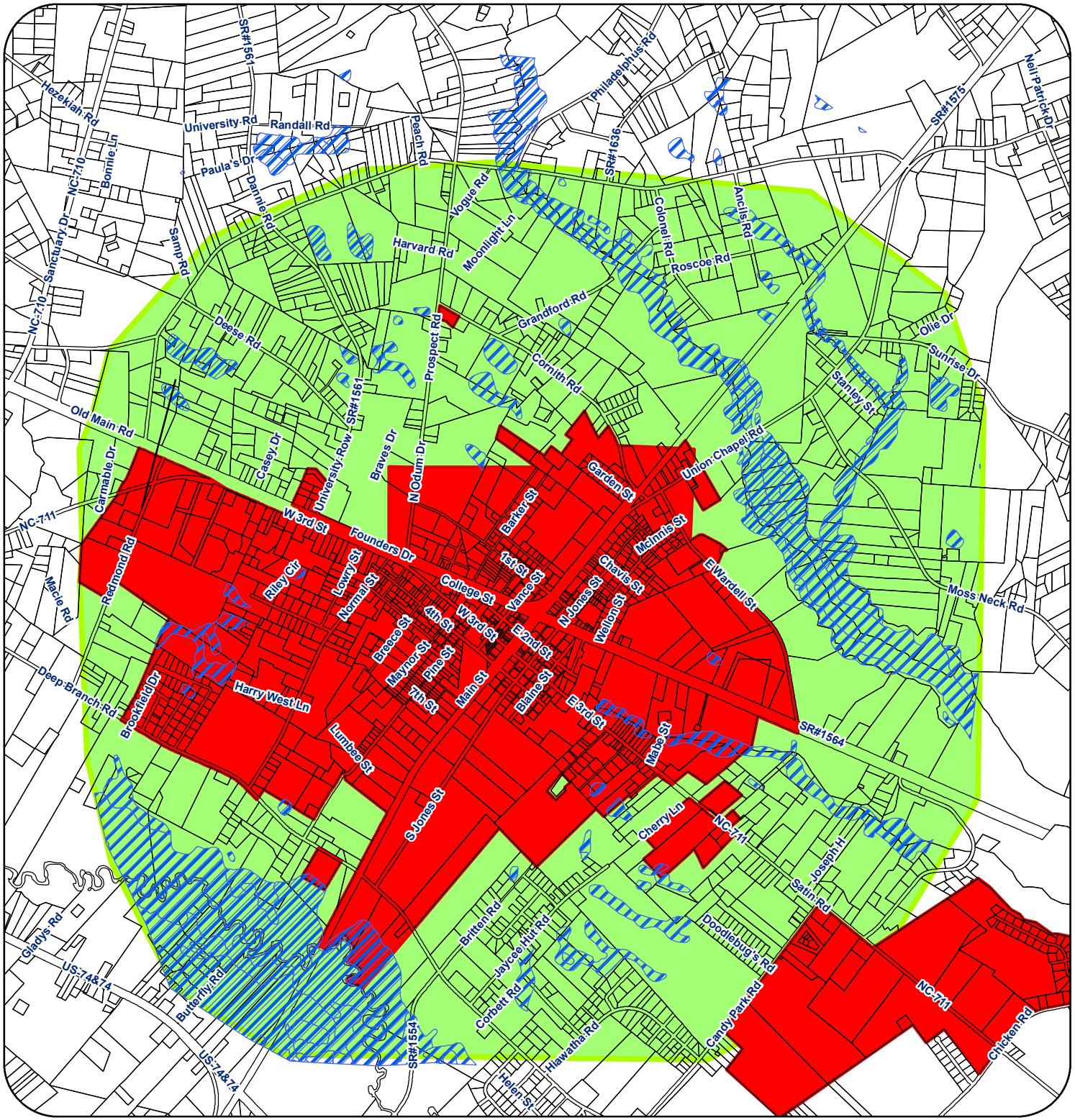
Freshwater wetlands are areas covered by water or that have waterlogged soils for long periods during the growing season. Plants growing in wetlands are capable of living in soils lacking oxygen for at least part of the growing season. Some wetlands, such as swamps, are obvious. Others are sometimes difficult to identify because they may be dry during part of the year. Wetlands include, but are not limited to, bottomlands, forests, swamps, pocosins, pine savannahs, bogs, marshes, and wet meadows.

Section 404 of the Clean Water Act requires that anyone interested in depositing dredged or fill material into "waters of the United States", including wetlands, must apply for and receive a permit for such activities. Development interests and individuals who either knowingly or through ignorance violate the provisions of Section 404 may face substantial costs in restoring damaged wetlands as well as civil and criminal penalties. While there are scattered wetland areas located within Pembroke's planning jurisdiction, the specific locations of wetlands areas must be determined through specific on-site analysis.

Map 6

Town of Pembroke Hazard Mitigation Plan

Areas of Environmental Concern



Legend

- Town Limits
- ETJ
- Robeson County Parcels
- Wetlands

N
W E
S

1 inch = 2,451 feet

0 0.125 0.25 0.5 0.75 1 Miles

E. Critical Facilities

After a hazard event it is important to be aware of those facilities that are essential to the health, safety, and viability of the town. A summary of the town's most critical facilities is provided in Table 22. Included in the summary are town-owned buildings that are critical to the continuous operation of the town. The destruction or damage of any of the following facilities could greatly affect rescue and recovery efforts during a hazard event, could impede rehabilitation efforts after a hazard occurs, or could impair the ability of the town to provide shelter for those needing that service. Map 7 provides a location of these critical facilities.

Table 22. Town of Pembroke
Critical Facilities

Critical Facilities	Address
Pembroke Town Hall/Police Department	100 Union Chapel Road
Pembroke Rural Fire Department	1369 Prospect Road
Pembroke Fire Department	201 Main Street
Pembroke Public Works Facility/ Wastewater Treatment Plant	8257 Deep Branch Road
Pembroke United States Post Office	4619 Main Street
Pembroke Elementary School	550 S. Jones Street
University of North Carolina Pembroke	28372 NC Highway 711
First Health	923 West Third Street
Julian Pierce Clinic	307 East Wardell Drive
Indian Education Resource Center	811 West Third Street

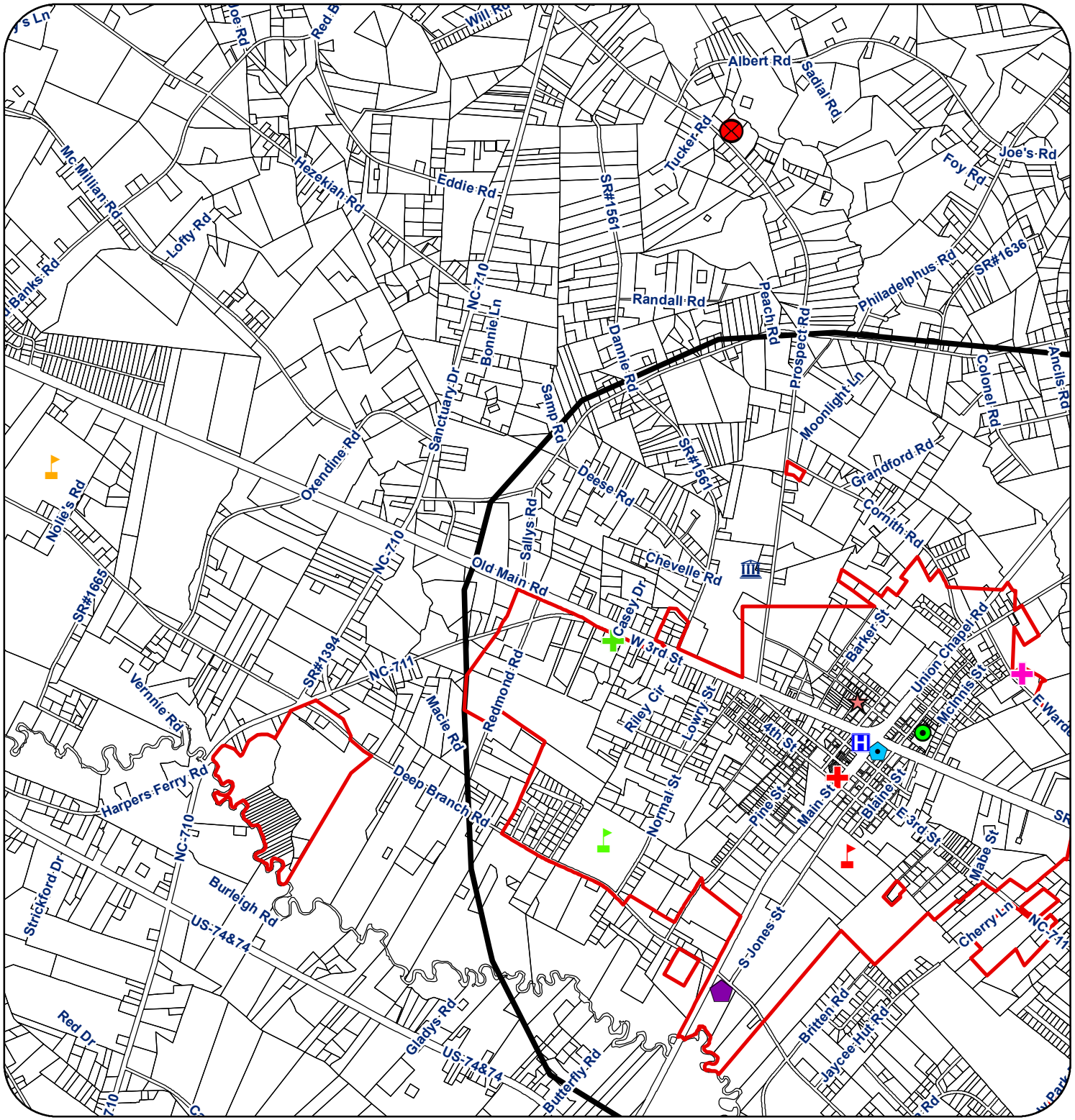
Source: Town of Pembroke, Robeson County, Robeson County Schools, and Robeson General Hospital.

In addition to the facilities listed above, the town's public works facilities would also be considered critical facilities for the efficient operation of public works within the town. There are 148,316 linear feet of water lines, 107,749 linear feet of sewer lines, 3 tanks, and 2 wells. Map 8 provides the locations of the town's infrastructure.

Map 7

Town of Pembroke Hazard Mitigation Plan

Critical Facilities



Legend

- Town Limits
- ETJ

Critical Facilities

- Pembroke Public Works
- First Health
- Chamber of Commerce
- Pembroke Elementary School
- Pembroke Middle School
- Pembroke High School
- Pembroke State University
- Pembroke Medical Center
- Julian T. Pierce Health Center
- Post Office
- Fire Department
- Pembroke Rural Fire Department
- Town Hall / Police Department

N W E S

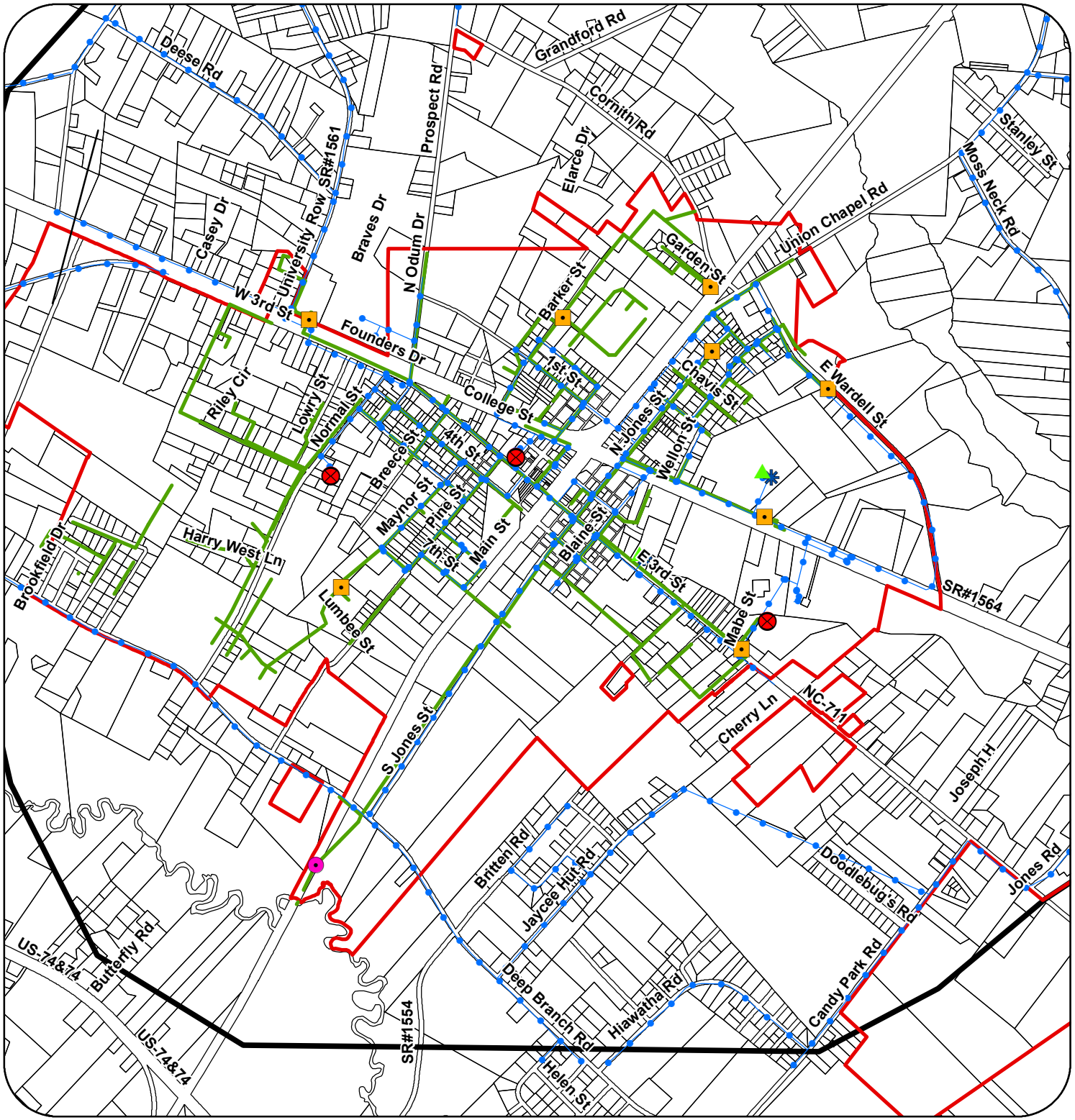
1 inch = 2,731 feet

0 0.15 0.3 0.6 0.9 1.2 Miles

Map 8

Town of Pembroke Hazard Mitigation Plan

Local Infrastructure



Legend

- Town Limits
- ETJ
- Water Tanks
- Sewer Pump Stations
- Sewer Treatment Plants
- Wells
- Water Treatment Plant
- Existing Water Lines
- Existing Sewer Lines

N
W E
S

1 inch = 1,809 feet

0 550 1,100 2,200 3,300 4,400 Feet

F. Hazard Locations

Based on information obtained from the hazard identification analysis and through the completion of Worksheet #1, it was determined that the town did not need to concentrate efforts on the mitigation of Earthquakes, Sinkholes, Droughts or Wildfires. Therefore, they are not further defined within this plan. Hazards identified in Worksheet #1 as possible, likely, or highly likely to occur within Pembroke are Hurricanes, Flooding, Nor'easters, Tornadoes and Thunderstorms, Severe Winter Storms, and Dam/Levee Failures. Hazard area locations are identified in this section for hazards that can be geographically defined. Those hazards include Flooding and Dam/Levee Failures. The remaining hazards affect the entire town and are not easy to geographically define. Therefore, the entire town is considered exposed to those hazards.

1. Individual Hazard Areas

a. Flooding

According to Flood Insurance Rate Maps (FIRMs) for the Lumber River Basin, almost ten percent (10%), or 552 acres, of the town's planning jurisdiction is in a flood hazard area. Three percent (3%), or 52.6 acres, of the corporate limits is in a flood hazard area, and fifteen percent (15%) of the ETJ is in a flood hazard area. All of this acreage falls within the AE flood zone. Map 9 depicts the location of flood hazard areas within the Town of Pembroke.

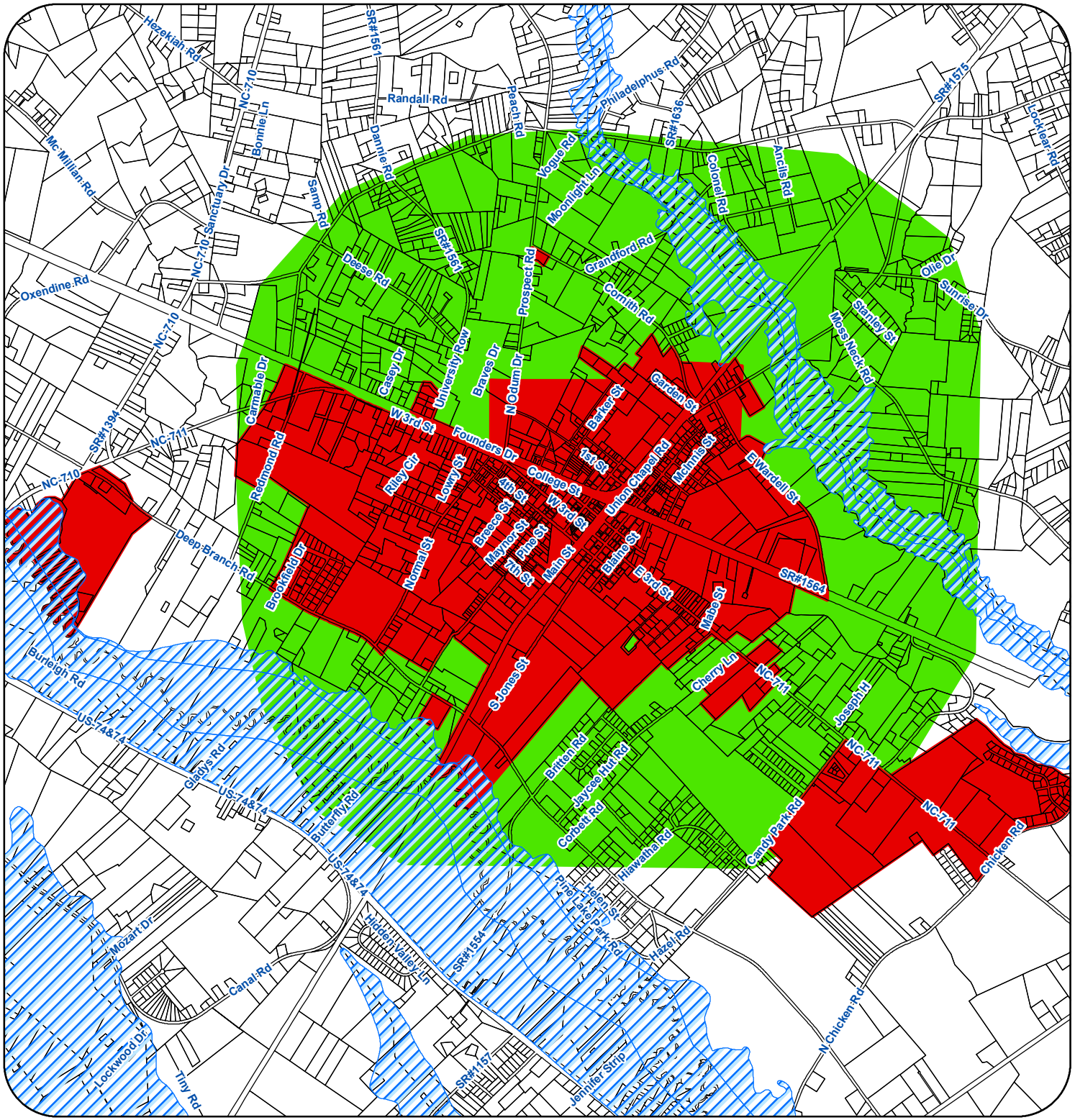
b. Dam/Levee Failures

As mentioned in the hazard identification section, Pembroke is identified as the nearest town to be affected by a dam failure to one dam located in the Lumber River Basin. This dam has a low hazard classification assigned by the North Carolina Dam Safety Program, and is used for recreation purposes only. If any of the dams located within Robeson County fail, the area affected will likely be located in the general area of the flood hazard area.

Map 9

Town of Pembroke Hazard Mitigation Plan

Flood Hazards



Legend

- Town Limits
- ETJ
- Robeson County Parcels

Flood Zone

- AE

N
W E
S

1 inch = 2,975 feet

0 0.15 0.3 0.6 0.9 1.2 Miles

2. Composite Exposure

An all hazards composite map can be found on Map 10. This map shows the flood hazard area and the dam locations for those dams with Pembroke as the nearest town to be affected by a failure. It should be noted again that the entire town is considered to be exposed to hazards that are not site specific and cannot be geographically defined. Therefore, Map 10 provides a map of the area impacted by the following hazards: earthquake, hurricane, nor'easter, tornado, severe winter storm, and wildfire.

3. Critical Facilities and Hazard Area Intersection

Map 11 identifies the intersection of the hazard areas and the town's critical facilities. All critical facilities are considered to intersect with some type of hazard since the entire town is considered exposed. However, the Pembroke Sewer Plant is the only municipal facility that falls within close proximity to geographically defined hazards.

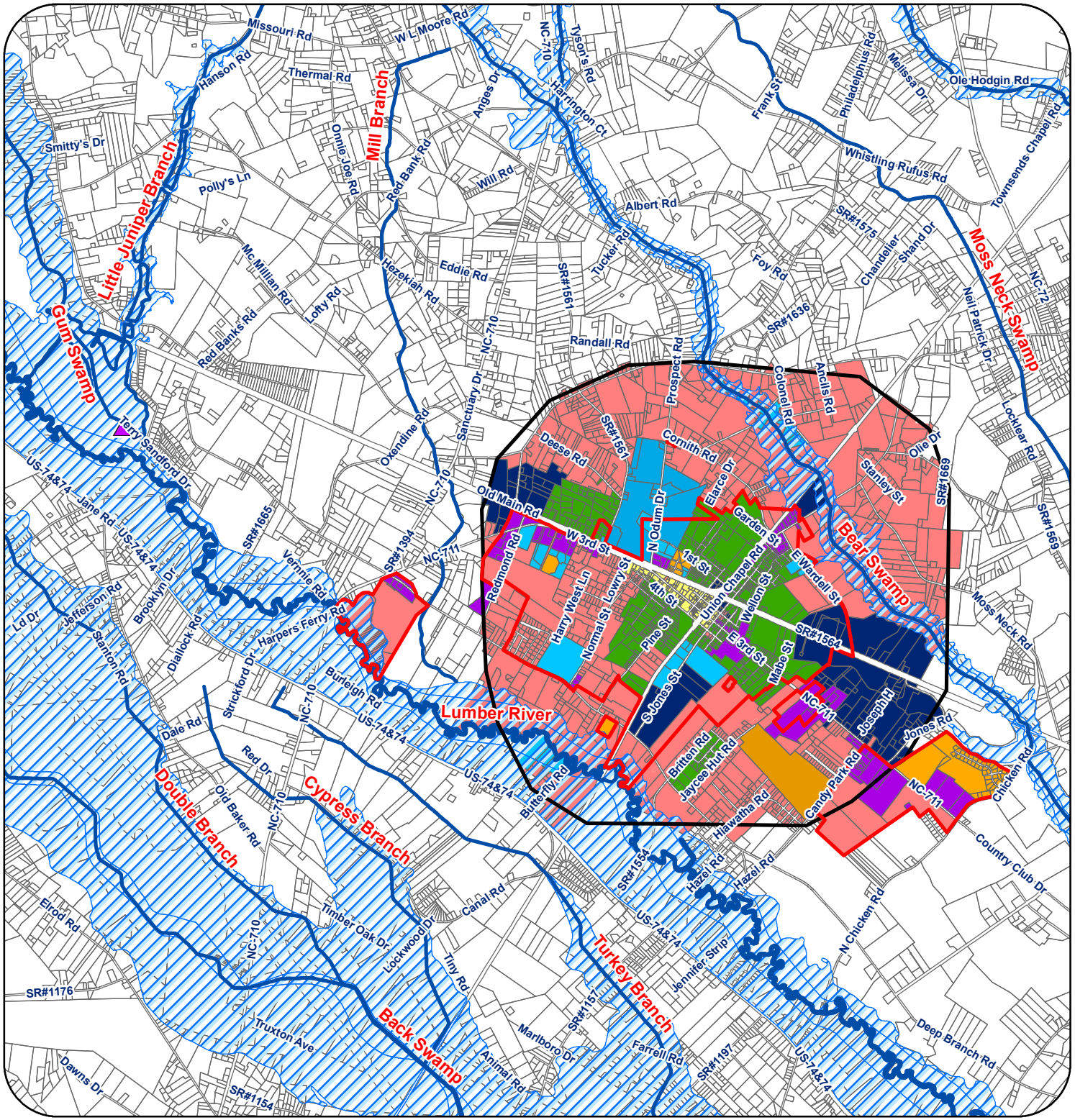
4. Repetitive Loss Structures

As noted in "Keeping Natural Hazards from Becoming Disasters: A Mitigation Planning Guidebook for Local Governments" produced by NCEM, repetitive loss structures are those that have suffered damage from repeated hazard events. The only reliable source of information on repetitive loss structures is flood insurance claims data available through the National Flood Insurance Program (NFIP). There are no repetitive loss structures within the Town of Pembroke.

Map 10

Town of Pembroke Hazard Mitigation Plan

Composite Hazard



Legend

- Town Limits
- ETJ
- Robeson County Parcels
- Pembroke Dam
- Hydrology

Flood Zone

- AE

Zoning

- C1
- C3
- Industrial
- OI
- OS
- R10
- R20
- R8

N W E S

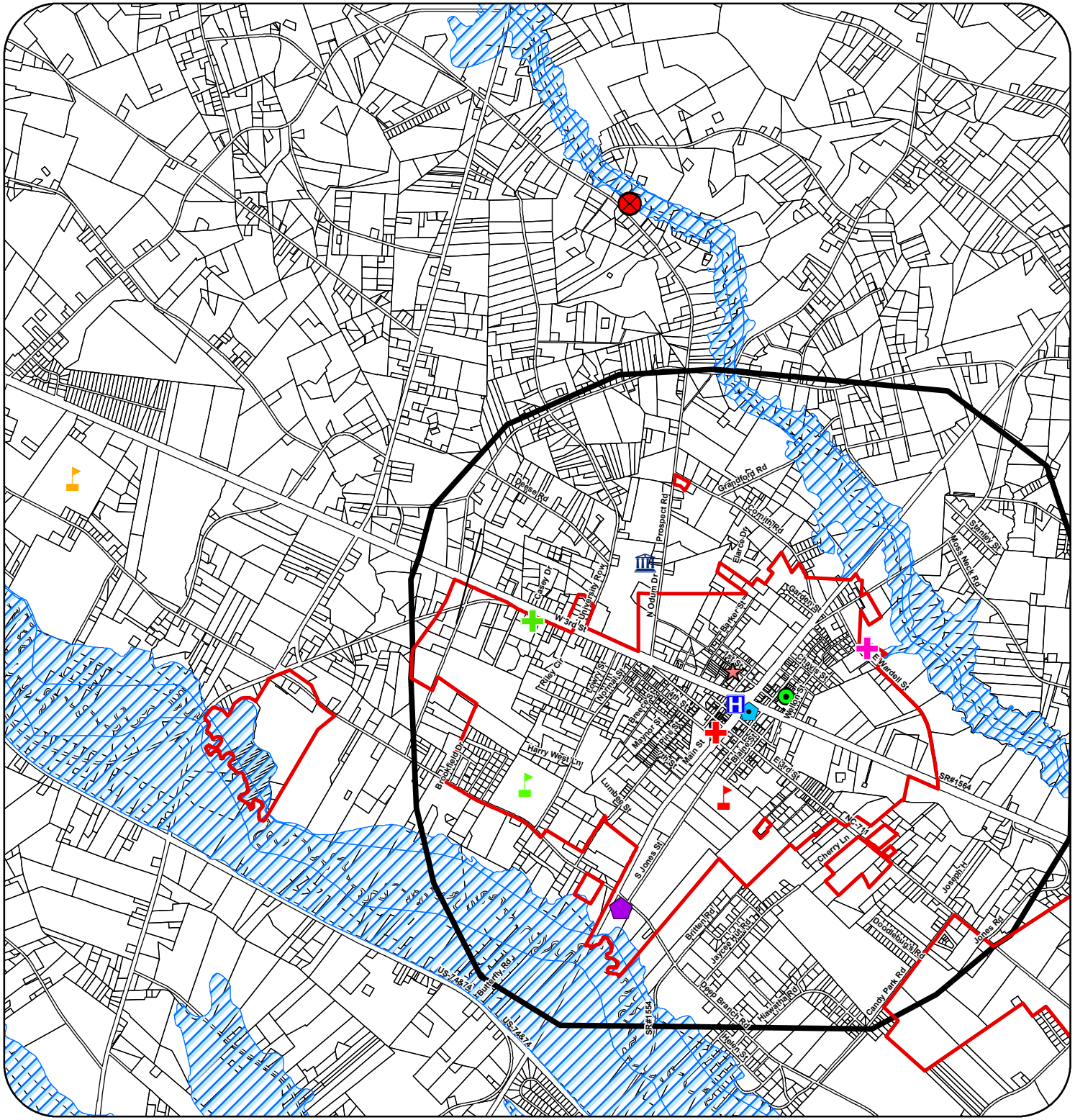
1 inch = 4,741 feet

0 0.25 0.5 1 1.5 2 Miles

Map 11

Town of Pembroke Hazard Mitigation Plan

Critical Facilities & Flood Hazards



G. Geographic Planning Areas

Information obtained thus far has enabled the town to determine hazards that affect the town's developed areas, the location of critical facilities, and areas within the town that have a hazard concern. The focus for mitigation for each hazard should be defined by geographic planning area. The town has been divided into two geographic planning areas: the Non-Specific Hazard Area and the Flood Hazard Area. The non-specific hazard area includes the hazards identified as important but that are not easy to geographically define (Tornadoes and Thunderstorms, Severe Winter Storms, Hurricanes, and Nor'easters). The entire town is exposed to these hazards. The Flood Hazard Area covers areas identified on the Flood Insurance Rate Maps as areas susceptible to flooding. Since a dam failure would result in flooding generally along the flood hazard area, a separate planning area was not created.

Worksheets 2A and 2B detail the vulnerability assessment for both of the geographic planning areas. The information provided in these two worksheets has been updated using the refined information as discussed. Through this process, it has been determined that the information provided in the 2004 plan was fairly inaccurate. The methodology by which the numbers were determined follows.

WORKSHEET #2A: GEOGRAPHIC PLANNING AREA VULNERABILITY ASSESSMENT

Geographic Planning Area: Non-Specific Hazard Area
Hazard: Hurricanes, Tornados and Thunderstorms, Severe Winter Storm, and Nor'easters

	CURRENT CONDITIONS			POTENTIAL FUTURE CONDITIONS		
Type of Development	**Number of Existing Units ***	**Current Value**	**Current Number of People**	**Projected Number of Buildings** (if developed under existing policies)	**Projected Value**	**Projected Number of People** (if developed under existing policies)
Residential	1,111	$89,202,900	2,733	762	$48,158,400	1,874
Business	176	$35,375,800	1,850	224	$50,519,616	N/A
O&I/Public	54	$92,173,000	N/A	N/A	N/A	N/A
Total	1,341	$216,751,700	4,583	N/A	N/A	N/A

Please refer to text for an explanation of why N/A was utilized under Potential Future Conditions.

* For the purposes of this plan, a unit is defined as an individual developed parcel. There may be more than one building on a given parcel; however, this will be treated as a single unit. Please note that the current value accounts for all structures.

(Worksheet #2A continued on next page)

(Worksheet #2A continued from previous page)

	CURRENT CONDITIONS			POTENTIAL FUTURE CONDITIONS		
Critical Facilities						
Type of Development	**Number of Existing Critical Facilities**	**Current Replacement Value**	**Current Number of People**	**Projected Number of Critical Facilities**	**Projected Replacement Value**	**Projected Number of People**
Pembroke Town Hall & Police Department	1	$739,000	Town Hall-4 Police-14	1	$739,000	Same
Pembroke Rural Fire Department	1	Not available	33	1	Not available	Same
Pembroke Volunteer Fire Department	1	$106,800	10	1	$106,800	Same
Pembroke Public Works Department	3	$109,600	13	3	$109,600	Same
Pembroke US Post Office	1	Not available	3	1	Not available	Same
Pembroke Elementary School	1	$4,375,400	850	1	$4,375,400	Same
University of North Carolina Pembroke	1	$62,283,500	5,250	1	$62,283,500	Same
First Health	1	$1,645,300	35	1	$1,645,300	Same
Julian Pierce Clinic	1	$530,700	15	1	$530,700	Same

WORKSHEET #2B: GEOGRAPHIC PLANNING AREA VULNERABILITY ASSESSMENT

Geographic Planning Area: Flood Hazard Area
Hazard: Floods and Dam/Levee Failures

	CURRENT CONDITIONS			POTENTIAL FUTURE CONDITIONS		
Type of Development	**Number of Existing Units**	**Current Value**	**Current Number of People**	**Projected Number of Buildings** (if developed under existing policies)	**Projected Value**	**Projected Number of People** (if developed under existing policies)
Residential	7	$557,800	17	133	$8,415,708	327
Business	1	$5,300	4	21	$4,736,214	N/A
Public	1	$0	0	N/A	GIS data unavailable	N/A
Total	8	$563,100	21	N/A	GIS data unavailable	N/A

(Worksheet #2B continued on next page)

(Worksheet #2B continued from previous page)

	CURRENT CONDITIONS			POTENTIAL FUTURE CONDITIONS		
Critical Facilities						
Type of Development	**Number of Existing Critical Facilities**	**Current Tax Value**	**Current Number of People**	**Projected Number of Critical Facilities**	**Projected Replacement Value**	**Projected Number of People**
No critical facilities are located within the Flood Hazard Area						
Total						

The methodology for completing the preceding charts is as follows:

1. Non-Specified Hazard Area

a. Current Conditions

As discussed throughout this section of the plan, the Town of Pembroke has much more accurate information available now than was in place during the development of the 2004 plan. Thus the town was able to compile an accurate assessment of existing development conditions. The current conditions outlined within Worksheet 2A reflects the existing land use inventory developed in conjunction with the 2005 land use plan, as shown on Map 12. It should be noted that the land use inventory was updated to reflect 2009 conditions. The value reported under this section reflects the 2009 tax value as reported by the Robeson County Tax Office.

b. Future Conditions

In order to develop a forecast of potential development within the non-specified hazard area, undeveloped land identified through the existing land sue survey was cross-referenced with corresponding zoning districts. This analysis took all vacant property and assigned each parcel a zoning classification. The zoning classification was utilized to determine a proposed use for each undeveloped tract of land. In order to determine the number of forecasted units, an average figure was calculated for each land use category as outlined in Worksheet 2A. The following average figures are based on existing development within the town's corporate limits:

Residential: 2.2 acres
Business: 1.8 acres
O&I/Public: 8.6 acres

Once the total number of units and acreage were determined, the estimated population for residential development was calculated, based on an average household size of 2.45 persons for Pembroke as reported by the 2000 US Census. The projected value was based on the average value of existing development as follows:

Residential: $63,200
Business: $225,535
O&I/Public: It was determined that an average figure regarding this land use will be inaccurate.

It should be noted that this methodology may be used in future updates; however, data availability and technical resources will be reviewed in 2015 to determine the most appropriate course of action.

2. Flood Hazard Area

a. Current Conditions

The methodology for the vulnerability summary addressing the flood hazard area within Pembroke's planning jurisdiction is the same as that outlined for non-specific hazards (Worksheet 2A). The primary difference is that Worksheet 2B only addresses portions of the town that fall within a FEMA-defined flood hazard area.

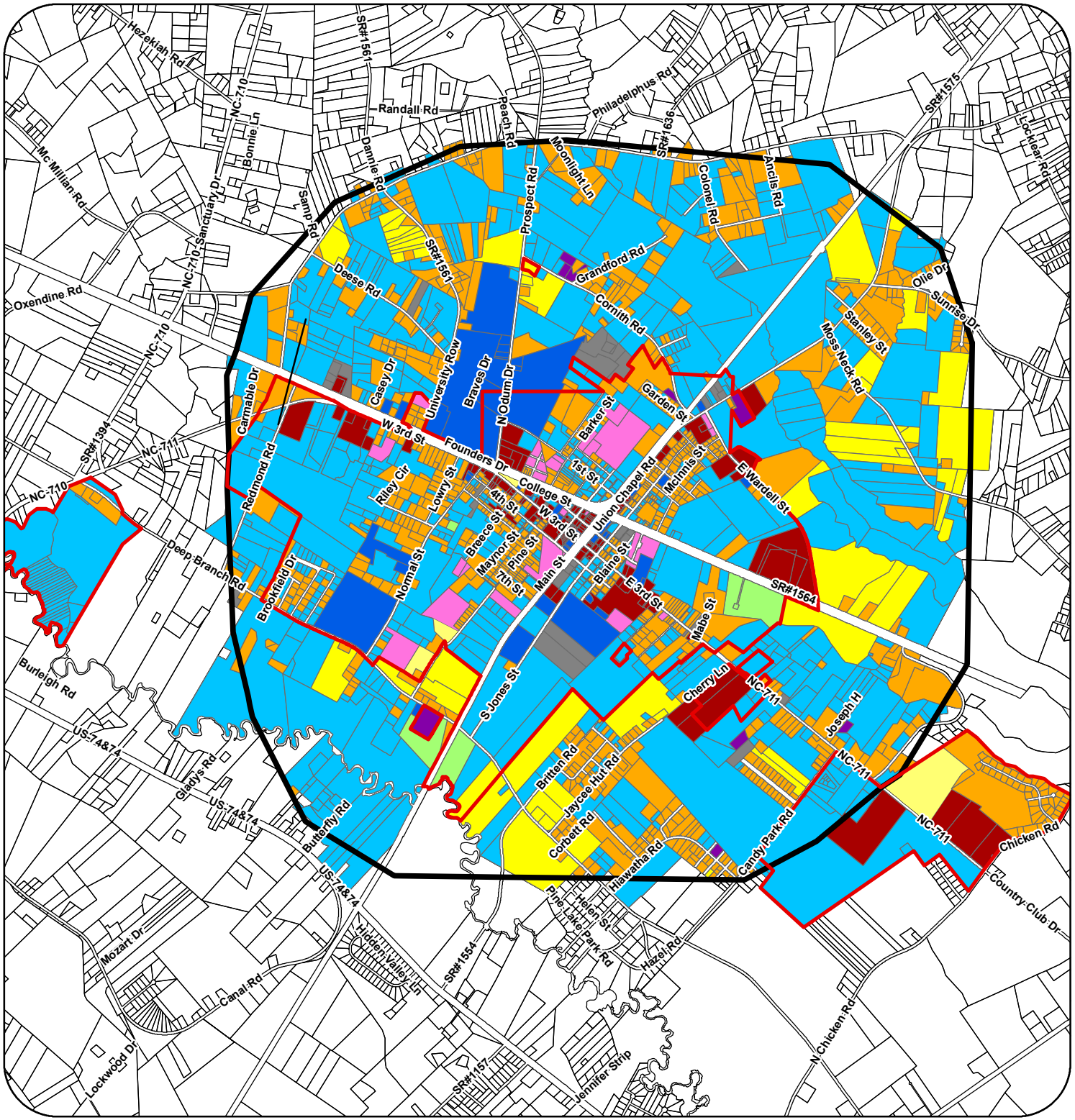
b. Potential Future Conditions

The methodology for the vulnerability summary addressing the flood hazard area within Pembroke's planning jurisdiction is the same as that outlined for non-specific hazards (Worksheet 2A). The primary difference is that Worksheet 2B only addresses portions of the town that fall within a FEMA-defined flood hazard area.

Map 12

Town of Pembroke Hazard Mitigation Plan

Existing Land Use



Legend

- Town Limits
- ETJ
- Robeson County Parcels

Existing Land Use

- AG-RES
- Com
- IND
- MF
- MHP
- OI
- REC
- RES
- UTIL
- Vacant

N
W
E
S

1 inch = 2,975 feet

0 0.15 0.3 0.6 0.9 1.2 Miles

SECTION 4: COMMUNITY CAPABILITY ASSESSMENT

A. Institutional Capability

The Town of Pembroke was chartered in 1895 and is governed by a Town Council-Manager form of government. There are three (3) departments which include: Administration, Police/Fire/Rescue, and Public Works. The town employs a total of 31 full-time employees.

Police, Fire, and Rescue departments play a critical role in the mitigation of and response to natural hazards. The adequacy of hospitals and available health care facilities also have an impact on an area's ability to cope with natural hazards. The following provides a brief description of these facilities and departments.

1. Law Enforcement

Police protection is provided by the Pembroke Police Department. The department is located at the Town Hall and consists of 17 full-time employees including a chief, an assistant chief, 13 officers, and 4 dispatchers. The response time of the department is approximately five minutes. Officers are dispatched by town personnel during normal business hours and by the Robeson County Sheriff's Department at night and on weekends. The department utilizes 13 radio cars and one auxiliary vehicle.

2. Fire/EMS Protection

Fire protection services are provided through the Pembroke Volunteer Fire and Rescue Department. The volunteer fire department has 27 personnel, is responsible for the Pembroke jurisdiction, and works in conjunction with Robeson County EMS. All response, except fires within the corporate limits of Pembroke, are routed through the Robeson County 911 call center. These calls are then forwarded to the Pembroke Volunteer Fire Department. Robeson County EMS handles all Emergencies, and works in conjunction with the county volunteer fire departments to handle fires. The following apparatus are currently being utilized by the Pembroke Volunteer Fire and Rescue Department:

1999 Pierce Fire Truck
1992 Ford Ambulance (used by first responders)

Currently, the town's ISO fire insurance rating is a nine (9) on a scale of one (best) to ten (no protection).

3. Hospital and Health Services

There are two significant health service providers located within Pembroke: Healthkeepers and First Health of North Carolina. These two facilities handle a majority of emergency situations, but in the event that these facilities are not sufficient, citizen's of Pembroke can be transported to Southeastern General Hospital in Lumberton, NC.

Healthkeepers is a health care service provider that serves roughly a ten county area. It was founded in 1965 by Howard Brooks and was originally named Pembroke Drug Center. Since then, several businesses have become affiliated with the drug center to provide the community with a more comprehensive health care system. The Pembroke Drug Center changed its name to Healthkeepers, which is now the largest health care provider in Robeson County, employing over 500 individuals. Services provided at this facility include: personal care, home health care, pharmacy, medical equipment, and respiratory care.

First Health of the Carolinas is a health care network that offers quality health care services to fifteen counties, including Robeson. Business North Carolina recently ranked hospitals in the state. First Health Moore Regional Hospital in Pinehurst ranked first for Heart, second for Orthopedics, and third for Vascular Surgery. The Town of Pembroke has two facilities affiliated with First Health of the Carolinas: Pembroke Family Care Center and Pembroke Health and Fitness. The two centers are located in the same building which opened in 2001. There are four physical therapists and 30 health and fitness employees in the Health and Fitness Center. The Family Care Center has one family practice, one internal medicine practice, and has rotating specialists.

During hazard events, a shelter is provided for those needing to seek refuge. Pembroke utilizes Purnell Swett High School as a shelter, and in extreme circumstances the volunteer fire department is utilized as a shelter. Notification regarding the shelter opening is given through the news media. This notification is made through the Town of Pembroke.

B. Plan and Ordinance Review

The following provides a summary of plans and ordinances relevant to hazard mitigation that the town has completed or is currently involved. The town has a competent staff that oversees these plans and ordinances, with the exception of the Flood Damage Prevention Ordinance and State Building Code which are administered by the Robeson County Inspections Department.

1. Floodplain Damage Prevention Ordinance

The Town of Pembroke joined the National Flood Insurance Program (NFIP) in 2007. This effort was identified as a strategy in the 2004 plan. The goals, objectives, and strategies in this plan are geared towards furthering the Town's participation in the NFIP. The Town's floodplain damage prevention ordinance is administered through the town's building permit issuance process which is handled by Robeson County. This ordinance is enforced as a condition of participation in the NFIP. The ordinance has the following purpose and objectives:

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

(1) Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;

(2) Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

(3) Control the alteration of natural floodplains, stream channels, and natural protective barriers which are involved in the accommodation of flood waters;

(4) Control filling, grading, dredging, and other development which may increase erosion or flood damage; and

(5) Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards to other lands.

Objectives. The objectives to this chapter are:

(1) To protect human life and health;

(2) To minimize expenditure of public money for costly flood control projects;

(3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

(4) To minimize prolonged business interruptions;

(5) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains;

(6) To help maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas; and

(7) To ensure that potential home buyers are notified that property is in a flood area.

The ordinance includes the following provisions for Flood Hazard Reduction:

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

(2) Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable state requirements for resisting wind forces;

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

(4) All new construction or substantial improvements shall be constructed by methods and practices that minimize flood damages;

(5) Electrical, heating, ventilation, plumbing, air conditioning equipment, and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;

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

(7) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters;

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

(9) Any alteration, repair, reconstruction, or improvements to a structure which is in compliance with the provisions of this ordinance, shall meet the requirements of "new construction" as contained in this ordinance.

In addition to a purpose, objectives, and provisions for flood hazard reduction, the ordinance also includes specific standards for residential and non-residential structures, manufactured homes, and elevated buildings. Structures are required to have the lowest floor elevated no lower than two feet above the level of the base flood elevation.

2. North Carolina State Building Code

The Town of Pembroke has adopted and enforces the North Carolina State Building Codes through the Robeson County Inspections Department. The NC State Building Codes regulate for fire resistance, in addition to seismic, flooding, and high wind resilience. These codes are reviewed annually and amended as new requirements and materials are

introduced. Building codes apply primarily to new construction or buildings undergoing substantial alteration. North Carolina has a specific building standard for coastal counties that is designed to ensure a structure's survival in 110 mph winds.

Enforcement at the local level extends beyond construction inspections to the advance review of plans. An applicant for a building permit must submit plans to the town's administration department for approval. Administration reviews the plans and elects to approve or reject them or to require revisions. Construction cannot begin until local officials confirm that the plans are in accordance with the code.

A Robeson County building inspector must then visually monitor the construction of the building. The inspector's duty is to make sure that the project follows the plans as approved. Inspectors are empowered to stop work on projects that fail to conform to the plans. Any observed errors must be fixed before work can continue. The inspector must perform a final review before a certificate of occupancy is issued.

3. Unified Development Ordinance

Pembroke's unified development ordinance is consistent with NCGS 160A-381, which is the enabling legislation for the preparation of zoning ordinances for municipalities. The ordinance provides for nine separate zoning districts, which may be divided into residential, business, office and institutional, industrial, and open space districts.

Hazardous areas are zoned for development due to the fact that the entire town is considered at risk to hazards to some degree. However, hazard mitigation measures are taken during development phases. The measures to be taken are based upon the proposed land use and the hazard that could affect the property.

During 2009, the Town of Pembroke undertook a comprehensive overhaul of their existing ordinances. The revised zoning districts are outlined on pages 54-55 of the plan.

4. Subdivision Regulations

The Town of Pembroke's subdivision regulations are consistent with NCGS 160A-371, which is the enabling legislation for adoption of subdivision regulations for municipalities.

Section 151.43 of the subdivision regulations states that the Planning Board may require the subdivider to dedicate open spaces for such public purposes as parks and playgrounds for residents of the proposed subdivision.

According to Section 151.61, stormwater runoff shall be addressed in accordance with requirements of the NC Division of Environmental Management and the town Standard Specifications. Section Six states that a plan to accommodate stormwater runoff shall be required for every major subdivision plat.

5. Land Use Plan

The Town of Pembroke Land Use Plan Update was adopted in May of 2005, and includes policy statements which address the following issues:

1. Land Use and Development
2. Infrastructure Review
3. Local Development Policies
4. Establishment of Future Land Use Map

The policy statements establish local planning policy, with regard to rezoning and development approval.

Within the current Land Use Plan, there are policies that address the issue of mitigation and emergency response; however, the town will defer to this document in their comprehensive mitigation planning efforts.

C. Legal Capability

As a general rule, local governments have only that legal authority which is granted to them by their home state. This principle, that all power is vested in the State and can only be exercised to the extent it is delegated, is known as "Dillon's Rule," and applies to all North Carolina's political subdivisions. Enabling legislation in North Carolina grants a wide array of powers to its cities, towns, and counties.

Local regulations that are enacted within the bounds of the state's enabling authority do not automatically meet with judicial acceptance. Any restrictions which local

governments impose on land use or building practices must follow the procedural requirements of the Fourteenth Amendment, or risk invalidation.

These and other constitutional mandates apply to federal and state governments, and all their political subdivisions. Any mitigation measures that are undertaken by the local government in its regulatory capacity must be worded and enforced carefully within the parameters established by the state and federal Constitutions, even when such measures are authorized by the General Statutes of North Carolina, and even when such measures are enacted in order to protect public health and safety by protecting the community from the impacts of natural hazards.

Within the limits of Dillon's Rule and the federal and state Constitutions, local governments in North Carolina have a wide latitude within which to institute mitigation programs, policies, and actions. All local government powers fall into one of four basic groups (although some governmental activities may be classified as more than one type of power): regulation, acquisition, taxation, and spending. Hazard mitigation measures can be carried out under each of the four types of powers. Following are a list of these powers and how they may be useful tools for hazard mitigation:

1. Regulations

a. General Police Power

Local governments in North Carolina have been granted broad regulatory powers in their jurisdictions. The North Carolina General Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances that define, prohibit, regulate, or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety, and welfare), towns, cities, and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard.

b. Building Codes and Building Inspections

Many structural mitigation measures involve constructing and retrofitting homes, businesses, and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through the building code. North Carolina has a state compulsory building code which applies throughout the state (N.C.G.S. 143-138). However, municipalities and counties may adopt codes for the respective areas if approved by the state as providing "adequate minimum standards." Local regulations cannot be less restrictive than the state code.

Local governments in North Carolina are also empowered to carry out building inspection. N.C.G.S. Ch. 160A, Art. 19, Part 5; and Ch. 153A, Art. 18, Part 4 empower cities and counties to create an inspection department, and enumerates local duties and responsibilities which include enforcing state and local laws relating to the construction of buildings; installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Inspections for the Town of Pembroke is handled by the Robeson County inspections department.

c. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls.

2. Acquisition

The power of acquisition can be a useful tool for pursuing mitigation goals. Local governments may find the most effective method for completely "hazard-proofing" a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. North

Carolina legislation empowers cities, towns, and counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease, or eminent domain. However, the legal authority of a community to acquire private property through eminent domain exclusively for the purpose of reducing flood damage is questionable at best. Such acquisition would succeed only if an objective public benefit could be demonstrated to accrue from the acquisition.

3. Taxation

Taxation is yet another power granted to local governments by North Carolina law which can be used as a hazard mitigation tool. However, the power of taxation extends beyond merely the collection of revenue. Many communities set preferential tax rates for areas which are unsuitable for development (e.g., agricultural land, wetlands) and can be used to discourage development in hazardous areas.

Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending, or otherwise building or improving beach erosion control or flood and hurricane protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development.

Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of services a town deems necessary within its boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development.

4. Spending

The fourth major power that has been delegated from the North Carolina State General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles should be made a routine part of all spending decisions made by the local government, including annual budgets and Capital Improvement Plans.

A capital program is usually a timetable by which a municipality indicates the timing and level of municipal services it intends to provide over a specified duration. Capital programming, by itself, can be used as a growth management technique with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend municipal services, a community can control its growth to some extent especially where the surrounding area is such that the provision of on-site sewage disposal and water supply are unusually expensive. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to municipal services.

A capital improvement program (CIP) that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs.

D. Fiscal Capability

There are many diverse sources of funding available to communities to implement local hazard mitigation plans, including both government and private programs. Often an organization with a particular focus will fund only part of a project. However, with coordination, the community can combine the funding efforts of one program with those of another, thereby serving multiple missions. The grant and loan programs described in the following two pages of this plan provide a significant outline of funding options, but additional resources are available.

While federal and national programs carry out the bulk of disaster relief programs that provide funds for mitigation, local governments are encouraged to open the search field as widely as possible, and include alternative funding sources to supplement the local hazard mitigation budget. For instance, local businesses and organizations will frequently support projects that benefit their customers or employees, or which constitute good "PR." Other groups or individuals may be willing to donate "in-kind" services, eliminating the need for cash. Often the in-kind and volunteer services of local community members can be counted toward the local share that is typically needed to match an outside source of funds.

Local governments may also engage in their own "fund-raising" efforts to pay for mitigation programs that benefit the community at large. In North Carolina, local governments are granted limited powers to raise revenue for public purpose. The General Assembly has conferred upon cities, towns, and counties the power to levy property taxes for various purposes, including: "ambulance services, rescue squads, and other emergency medical services; beach erosion and natural disasters (including shoreline protection, beach erosion control, and flood and hurricane protection); civil defense; drainage projects or programs; fire protection; hospitals; joint undertakings with other town, city, or political subdivisions; planning; sewage; solid waste; water; water resources; watershed improvement projects" N.C.G.S. §16A-209. These statutorily enumerated purposes make it clear that local governments are empowered to finance certain emergency management activities, including mitigation activities, with property taxes.

The following is a list and description of several programs which offer funding for hazard mitigation, redevelopment, and post disaster recovery:

1. Hazard Mitigation Grant Program (HMGP)

The Federal Disaster Assistance Act (Stafford Act) provides funds authorized by the federal government and made available by FEMA for a cost-share program to states. The HMGP provides 75% of the funds while the states provide 25% of the funds for mitigation measures through the post-disaster planning process. The Division of Emergency Management administers the program in this state. The state share may be met with cash or in-kind services. The program is available only for areas affected by a Presidentially-declared disaster.

2. Disaster Preparedness Improvement Grant (DPIG)

This grant provides federal matching funds for communities to develop hazard mitigation plans, expand existing plans, update disaster preparation plans, and to prepare the administrative plans required to qualify for Hazard Mitigation Grant Program grants. Funds for the DPIG are provided by FEMA and the Division of Emergency Management administers the program in North Carolina.

3. Flood Mitigation Assistance Program (FMAP)

This program provides grants for cost-effective measures to reduce or eliminate the long-term risk of flood damage to the built environment and real property. The program's main goal is to reduce repetitive losses to the National Flood Insurance Program. The FMAP is available to eligible communities every year, not just after a Presidentially-declared disaster. Funds for the FMAP are provided by FEMA and the Division of Emergency Management administers the program in North Carolina.

4. Public Assistance Program (PA)

The Public Assistance program provides federal aid to communities to help save lives and property in the immediate aftermath of a disaster and to help rebuild damaged facilities. Grants cover eligible costs associated with the repair, replacement, and restoration of facilities owned by state and local governments and nonprofit organizations. The Public Assistance program is administered by FEMA.

5. Small Business Administration (SBA) Disaster Assistance Program

This program provides loans to businesses affected by Presidentially-declared disasters. The program provides direct loans to businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and equipment, inventory, and supplies. Businesses of any size are eligible. Nonprofit organizations are also eligible. The SBA administers the Disaster Assistance Program.

6. Community Development Block Grant (CDBG) Disaster Recovery Initiative

The CDBG program provides grants to communities for post-disaster hazard mitigation and recovery following a presidential declaration of a Major Disaster of Emergency. Funds can be used for activities such as acquisition, rehabilitation, or reconstruction of damaged properties and facilities and redevelopment of disaster-affected areas. Funds may also be used for emergency response activities, such as debris clearance and demolition and extraordinary increases in the level of necessary public services. HUD provides funds for the CDBG program, and with the help of the Division of Community Assistance administers the program in North Carolina.

E. Political Capability

The Town of Pembroke has been integrating hazard mitigation into its community planning efforts. Public education and awareness campaigns about the economic efficiency and social utility of mitigative measures in the long run can help foster its general acceptance by citizens and politicians. The prevention of and recovery from disasters also take close governmental coordination. This refers to coordination with and cooperation between agencies in a local government, between local governments in a town and between local, state, and federal governments. This coordination is essential in creating a workable local mitigation strategy. Pembroke is politically capable of carrying out this plan and its hazard mitigation goals and objectives.

F. Analysis of Capability

After the preceding capability information is gathered, the data must be analyzed and evaluated. Since the capability assessment will provide the framework for developing recommendations for specific mitigative actions in the hazard mitigation plan, it is essential that the assessment both identify shortfalls in a jurisdiction's capability, as well as draw attention to special opportunities that should be capitalized upon while they remain viable.

Worksheet 3 provides a summary of the town's existing policies and programs and their effectiveness at mitigating natural hazards. Generally, this assessment shows that the Town of Pembroke has been committed to mitigating the effects of natural hazards.

WORKSHEET #3: COMMUNITY CAPABILITY ASSESSMENT WORKSHEET

Policies and Programs	**Policy/Program Status** (potential, existing)	**Document Reference**	**Effectiveness for Mitigation** (low, medium, high)	**Rationale for Effectiveness**	**Recommendations for Incorporating into Hazard Mitigation Strategy**
Flood Damage Prevention Ordinance	Existing	N/A	Medium-High	Medium-high because it allows development in a flood hazard area but requires elevation to be at two feet above base flood elevation	The town has recently adopted this ordinance and will rely on Robeson County Inspections to enforce it.
Enforcement of State Building Code	Existing	NC State Building Code Volume I	Medium-High	Medium-high because it allows development in a flood hazard area but requires 110 mph wind-resistant construction	None
Unified Development Ordinance	Existing	N/A	Medium-High	Medium-high because it allows development in a flood hazard area but has development standards	None
Subdivision Ordinance	Existing	N/A	Medium-High	Medium-high because it allows development in a flood hazard area but has development standards	None
Land Use Plan	Existing	N/A	Medium-High	This document serves as a guide to long-term development policy throughout the town's planning jurisdiction.	Mitigation plan will be factored into all amendments.

SECTION 5: MITIGATION STRATEGIES AND POLICIES

This section of the Hazard Mitigation Plan provides the goal statements, which are the basis of the "action" sections of the plan. Additionally, a section has been added as part of the update process aimed at providing an overview of the town's mitigation program over the last five years.

A. Mitigation Program Progress Report

1. Public Participation

The Town of Pembroke works very closely with the town's citizens to provide programs and support that will improve the town's resiliency to natural disasters. Over the last five years, the town has worked closely with citizens regarding several initiatives outlined within the 2004 plan. The initiatives have included joining the National Flood Insurance Program, updating the Town's Flood Damage Prevention Ordinance (FDPO), developing a Land Use Plan, and developing a Unified Development Ordinance (UDO). The public was an integral part in carrying out all of these projects. The development of both the land use plan and the Unified Development Ordinance involved discussions relating to hazard mitigation issues. The public was involved in the development of the UDO, updated FDPO, and land use plan development through advertised public hearings. Additionally, all Planning Board and Town Council meetings are advertised and open to the public. All issues relating to mitigation efforts and progress are discussed within these two forums.

2. Monitoring and Evaluation

The Town of Pembroke administration utilized the information within this document during the development of both the Town's Land Use Plan and Unified Development Ordinance. As stated, the development of the Town's Land Use Plan resulted in information that has served an integral role in developing this document. Through monitoring the status of this plan, the town has not only improved upon the data resources utilized within the vulnerability analysis, but has joined the National Flood Insurance Program. The Town's administration maintains a dialogue with the Town Council regarding mitigation issues, and provides the public with information when deemed necessary.

3. Mitigation Strategy Progress

The following section provides a status update regarding the mitigation strategies outlined within the 2004 Town of Pembroke Hazard Mitigation Plan. Some of these strategies that have been completed will not be reflected within the plan update. If a strategy was deemed to be ongoing, or was not completed, then it will remain within the update and will be considered for implementation within the next five years.

Policy #1 (2004 Plan): Adoption of a Comprehensive Stormwater Management Program

To date, the Town has not developed a comprehensive stormwater management program. At the time that the 2004 plan was drafted, it was conceivable that the Town would be forced to address this issue. It is clear at this point that there will be no mandate for the town to comply with the NPDES Phase II rule. As part of the plan update, the town will consider developing a program to address stormwater "hot spots" identified on Map 3 of this document.

Status: Ongoing

Policy #2 (2004 Plan): Flood Damage Prevention Ordinance Update

The Town revised and adopted an updated Flood Damage Prevention Ordinance in 2007, in conjunction with joining the National Flood Insurance Program.

Status: Completed

Policy #3 (2004 Plan): Work with the State Office of Dam Safety and Robeson County

The Town continues to support Robeson County and the NC Office of Dam Safety in monitoring and inspecting DAM structures that may potentially have adverse impact on the Town.

Status: Ongoing

Policy #4 (2004 Plan): Review "Firewise" Zoning and Subdivision Standards

The Town revised its development regulations in 2009, and took Firewise standards into consideration through this process. In some instances, the Town feels that this policy has been implemented; however, more can be done to protect the town from urban fire and wildfire hazards. Thus, this policy will be carried forward into the updated plan.

Status: Ongoing

Policy #5 (2004 Plan): Join the NFIP; Pursue Community Rating System Status

The Town of Pembroke became a member of the National Flood Insurance Program in 2007. The town, at this point, has not joined the CRSA program, but will consider joining through the implementation of this plan.

Status: Completed/Ongoing

Policy #6 (2004 Plan): Implement Public Education Efforts

The Town has not done a good job of achieving the outreach efforts outlined in the 2004 plan. These policies will be carried forward into the plan update, and the Town will work to accomplish these actions on an annual basis.

Status: Ongoing

Policy #7 (2004 Plan): Apply for Funding from the Hazard Mitigation Grant Program

The Town has not applied for HMGP funding to achieve the development of any capital or structural projects. The Town did receive HMGP funding to address the update of this plan. The Town will maintain a policy of proactively seeking these funds as needs arise and grant monies are made available. This situation will most effectively apply in Pembroke following a state or federal disaster declaration within the Town.

Status: Ongoing

B. Goal Categories

Goals are statements of desirable future conditions that are to be achieved. They are broad in scope and assist in setting community priorities. The goals identified apply to all hazards. The goals were identified were discussed and/or developed during working meetings of the Mitigation Advisory Committee. The goals were assigned to a goal category. Those categories are listed below.

1. General - Goals that address the community's level of vulnerability and hazard threat in general.

2. Future Development - Goals that consider future development in areas exposed to an elevated risk of natural hazard damage.

3. Existing Development - Goals that address existing infrastructure and buildings in areas exposed to an elevated risk of natural hazard damage.

4. Redevelopment - Goals that address redevelopment in case of a natural disaster.

5. Public Education and Outreach - Goals that are focused on educating the public on natural hazard risks.

6. Natural Resource Protection - Goals that are focused on natural resource protection and a means of hazard mitigation.

C. Community Goals

The goals presented in this section were reviewed by the MAC during the plan update and were deemed to still be relevant to the town. It is critically important that hazard mitigation goals do not exist in isolation from overall community goals. As such, documents such as the comprehensive land use plan and zoning ordinance were consulted and reviewed in developing the following community goals. The following provides the community goals for the Town of Pembroke.

Goal Category	Goal Number	Goal Statement and Source Reference	New or Existing Goal?	Hazard Threat Addressed
General	1	Promote the public health, safety, and general welfare of residents and minimize public and private losses due to flood conditions. (Floodplain Damage Prevention Ordinance)	Existing	All (primarily flooding)
Future Development	2	Reduce the risk and impact of future natural disasters by regulating development in known high hazard areas. (Floodplain Damage Prevention Ordinance)	Existing	All (primarily flooding)
Existing Development	3	Pursue funds to reduce the risk of natural hazards to existing developments where such hazards are clearly identified and the mitigation efforts are cost effective.	New	All (primarily flooding)
Redevelopment	4	Ensure that hazard mitigation is considered when redevelopment occurs after a natural disaster.	New	All
Public Education and Outreach	5	Provide education to citizens that empower them to protect themselves and their families from natural hazards.	New	All
Natural Resource Protection	6	Protect fragile natural and scenic areas within the planning jurisdiction. (Land Use Plan)	Existing	Flooding

D. Mitigation Strategies and Policies

The Mitigation Strategies and Policies section of the plan identifies specific strategies and policies that will "put into action" the mitigation values and goals established above by completing the following steps:

- Formulating selection criteria
- Identifying policies to carry out the mitigation strategies
- Creating an action plan for the mitigation strategies
- Prioritizing the policies

- Identifying funding sources
- Assigning implementation responsibilities

1. Discussion of Geographic Planning Areas (GPA)

The town was divided into two Geographic Planning Areas (GPA); the Flood Hazard Area and the Non-Specific Hazard Area. The Non-Specific Hazard Area includes the hazards identified as important but that are not easy to geographically define.

2. Discussion of Mitigation Strategies and Section Format

The town has identified hazard mitigation objectives, which can be defined as measurable, concrete steps towards achieving the goals presented in the preceding section. Goals are considered met when objectives have been completed.

The town has also identified hazard mitigation policies, which are specific tasks and actions that achieve the above stated objectives. Objectives are considered met when all polices have been implemented.

When formulating objectives and policies, the town was very mindful of the available types of activities, or strategies, that will result in natural hazard mitigation, as presented in "Keeping Natural Hazards from Becoming Disasters: A Mitigation Planning Guidebook for Local Governments" published in May of 2003 by the NCDEM Hazard Mitigation Section and the Hazard Mitigation Planning Clinic at the Department of City and Regional Planning at the University of North Carolina at Chapel Hill. These are summarized below:

- **Prevention** - Actions designed to reduce the community's future vulnerability, such as zoning or stormwater management regulations.

- **Property Protection** - Retrofitting or removal of existing structures subject to a elevated risk of natural hazard damage.

- **Natural Resource Protection** - Preserving or restoring natural features to ensure or enhance their mitigative functions.

- **Structural Projects** - Modification of the natural environment through built structures to protect property and life.

- **Public Information** - Educational and informational activities.

A variety of strategies, and combination of strategies, will be utilized to meet the stated goals and objectives through the policies provided below. Policies selected will meet the following criteria:

- The policy will solve the problem it is intended to solve, or begin to develop a solution; and

- The policy meets at least one community mitigation goal; and

- The policy complies with all laws and regulations; and

- The policy is cost-beneficial; and

- The community implementing the policy has (or will have) the capability to do so; and

- The policy is environmentally sound; and

- The policy is technically feasible.

A process for prioritization of identified hazard mitigation strategies was performed. The following criteria for prioritization was used by the Mitigation Advisory Committee.

- Cost-benefit review
- Results of Hazard Identification and Analysis
- Results of Vulnerability Assessment
- Results of Community Capability Assessment
- Effectiveness in meeting Hazard Mitigation Goals and Comprehensive Plan Goals
- Continued compliance with the NFIP

Cost-benefit review was given special emphasis in light of its possible use in environmental reviews for HMGP, FMA, and other federal hazard mitigation projects.

Additionally, each mitigation policy has been provided a priority of low, medium, or high, based on a cost benefit review conducted through the planning process. The following provides a breakdown of the factors utilized to conduct this cost benefit review:

- **High Priority:** Highly cost-effective, administratively feasible, and politically feasible policies that should be implemented in fiscal years 2010/2011 and 2011/2012 and be continued.

- **Medium Priority:** Policies that have at least two of the following characteristics (but not all three) and that should be implemented in fiscal years 2012/2013 to 2014/2015:
  1. Highly cost-effective; or
  2. Administratively feasible, given current levels of staffing and resources; or
  3. Are politically popular and supportable given the current environment.

- **Low Priority:** Policies that have at least one of the following characteristics (but not two or three) and that should be implemented in the next five (5) years (by the end of 2015/2016):
  1. Highly cost-effective; or
  2. Administratively feasible, given current levels of staffing and resources; or
  3. Are politically popular and supportable given the current environment.

  Policies will be implemented earlier if resources are available. It should also be noted that projects or initiatives given low priority may be ultimately contingent upon grant funding.

3. Mitigation Objectives

As stated above, objectives are defined as measurable, concrete steps towards achieving the goals presented in this plan. When all objectives are complete, the goals will have been met. The following objectives were reviewed by the MAC during the update process and are still considered to be relevant to the town.

Goal Number	Objective Number	Objective
1	1	Ensure that all sheltering facilities are well publicized, accessible, and meet National standards for safety and supply
1	2	Reduce the frequency of electrical outages and length of time such outages last
2	1	Preserve open space in floodplain areas
2	2	Reduce the risk of damage from wildfires to future development
3	1	Reduce the risk of dam failure to existing development
3	2	Maximize the use of available hazard mitigation grant programs to protect the most vulnerable structures and populations
3	3	Reduce the risk of existing and future development through effective mitigation strategies.
4	1	Develop specific, timely recommendations for hazard mitigation measures following a State or Federally declared natural disaster
5	1	Ensure that the public is aware of the risks of different types of natural hazards, and reduces their personal exposure to natural hazards
6	1	Reduce, or maintain, the quantity and improve the quality of water discharging into water bodies, particularly those that provide drinking water supplies

4. Mitigation Policies

Specific actions, or "policies", are needed to realize each objective provided above. For each policy, the following information will be provided in this subsection:

1. A statement of the policy
2. The type of strategy represented by the policy
3. The hazard(s) it is developed to address
4. The objective(s) it will achieve
5. The priority the action has (high, medium or low)
6. Possible funding sources, if any
7. The agency or staff member assigned with responsibility for the policy
8. Projected completion date
9. Notes and/or background information on the policy

The town's policies are listed below:

Policy Number	1
Status	Deferred
Policy	Adoption of a Comprehensive Stormwater Management Program (SMP)
Strategy Type	Prevention
Hazard(s) Addressed	Flooding, primarily
Objective(s) Addressed	2.1, 2.2, and 6.1
Priority	Medium
Possible Funding Sources	North Carolina Clean Water Management Trust Fund (CWMTF). The contact is: Leland M. Heath III 4782 US Hwy 17 N Washington, NC 27889 e-mail: Leland@cwmtf.net http://www.cwmtf.net
Responsible Party	Town Manager
Projected Completion Date	As required under the NPDES Stormwater Program requirements

Notes/Background	The quantity of water running into drainage ways and the river can increase as the volume of impervious surfaces increase in an area, as does the peak flow rate. Without effective stormwater management, excess runoff can cause flooding, erosion and water quality problems. Effective BMPs call for both structural and (primarily) non-structural measures to control runoff and improve its quality.

Policy Number	2
Status	Ongoing
Policy	Work with the State Office of Dam Safety (ODS) and Robeson County to: a) Ensure that all dams in Robeson County for which the ODS has jurisdiction are inspected on a regular basis; and b) Ensure that ODS notifies the town and county of all ODS jurisdictional dams classified as "high hazard" or "distressed" dams; and c) Attempt to ensure that all high hazard or distressed dams in the County have an updated and implemented operations and maintenance plan and emergency action plans; and d) Provide the County EM office with an inventory of all ODS jurisdictional dams in the County
Strategy Type	Prevention and Property Protection
Hazard(s) Addressed	Dam Failure, Flooding
Objective(s) Addressed	3.1 and 5.1
Priority	Low
Possible Funding Sources	Coordination and technical assistance are available from the NC Dam Safety Program, contact is: Max Fowler, P.E., (919) 733-4574, http://www.dlr.enr.state.nc.us/dam.html
Responsible Party	Town Manager
Projected Completion Date	June 1, 2005
Notes/Background	The identification of potentially unsafe dams and the improvement of these dams (if possible) or the establishment of effective emergency action plans (if not possible) is the best feasible method of avoiding dam failure or minimizing damages in the case of dam failure .

Policy Number	3
Status	Deferred
Policy	Review "Firewise" zoning and subdivision standards and report on their appropriateness for incorporation into the existing zoning and subdivision ordinances.
Strategy Type	Prevention
Hazard(s) Addressed	Wildfire
Objective(s) Addressed	2.2
Priority	Low
Possible Funding Sources	N/A. Information on "Firewise" zoning and subdivision ordinance provisions is widely available in the public record. An excellent resource is http://www.firewise.org.
Responsible Party	Town Manager
Projected Completion Date	June 1, 2005
Notes/Background	A number of design, construction and landscaping techniques have been identified in the past dozen years or so that significantly reduce the risk of wildfire affecting a home (or significantly reduces the damage from wildfire).

Policy Number	4
Status	Deferred
Policy	Join the NFIP, pursue Community Rating System (CRS) status.
Strategy Type	Prevention
Hazard(s) Addressed	Flooding
Objective(s) Addressed	2.1
Priority	Low
Possible Funding Sources	North Carolina Emergency Management http://www.ncem.org. Funding source is Federal (75%) and non-Federal (usually State) (25%)
Responsible Party	Town Manager
Projected Completion Date	June 1, 2006
Notes/Background	Participation in the CRS system lowers insurance rates, therefore as part of completing this plan, the Town of Pembroke will join the NFIP.

Policy Number	5
Status	Ongoing
Policy	Implement public education efforts designed to help inform the public of their exposure to natural hazards and to inform them of actions they can take to mitigate the damages to their health and property from natural hazards, including but not limited to the following: a) Ensure that the local library maintains documents about flood insurance, flood protection, floodplain management, and natural and beneficial functions of floodplains. Many documents are available free of charge from the Federal Emergency Management Agency (FEMA). b) Encourage builders, developers, and architects to become familiar with the NFIP land use and building standards by attending annual workshops presented by the NC Division of Emergency Management (DEM). This can be accomplished by creating a mailing list and providing it to DEM to use for its announcements. This task can be further supported by distributing copies of DEM's announcement from the County's inspections department when builders and developers apply for permits. c) Develop a page within the town's website that identifies various hazard mitigation measures and shelter locations. d) Provide local real estate agents with handouts that will advise potential buyers to investigate the flood hazard for the property they are considering purchasing. e) Advertise the availability of flood insurance on an annual basis.
Strategy Type	Public Information
Hazard(s) Addressed	All
Objective(s) Addressed	1.1 and 5.1
Priority	Medium
Possible Funding Sources	FEMA, the American Red Cross and numerous other organizations have free public information materials than can be used to achieve this policy. http://www.fema.gov and http://www.redcross.org
Responsible Party	Planning Director
Projected Completion Date	June 1, 2005
Notes/Background	Public awareness can help lead to a citizenry who makes better decisions before, during and after a disaster, leading to a reduced risk of property damage and loss of life.

Policy Number	6
Status	Deferred/Ongoing
Policy	Apply for funding from the Hazard Mitigation Grant Program (HMGP) for one of the top priorities listed in Section II of this plan IF it is eligible and in a project category identified by the State of North Carolina as being of high priority.
Strategy Type	Property protection and/or structural projects
Hazard(s) Addressed	All, primarily flooding
Objective(s) Addressed	3.2 and 4.1
Priority	High
Possible Funding Sources	Background information on the Hazard Mitigation Grant Program (HMGP) and similar hazard mitigation programs can be found at http://www.ncem.org and at http://www.fema.gov. Funding source is Federal (75%) and non-Federal (usually State) (25%)
Responsible Party	Town Manager
Projected Completion Date	After next major Presidentially declared disaster
Notes/Background	The post-disaster environment provides the greatest opportunity for hazard mitigation, due to the attention paid to it by citizens and elected officials and due to the existence of damaged facilities and homes in need of repair that lend themselves to mitigation efforts. Therefore, funding should be sought to implement hazard mitigation at the nearest post-disaster opportunity.

Policy Number	7
Status	New
Policy	The Town of Pembroke will work to protect existing and future development through the following efforts: ▸ Enforcement of the Town of Pembroke Floodplain Development Ordinance. ▸ The MAC, through the town's Flood Damage Prevention Ordinance, will monitor and update this document as deemed necessary to ensure compliance with current NFIP regulations. ▸ The Town of Pembroke will hold a public outreach information session annually to provide information to citizens about methods that may be utilized to windproof and floodproof existing residential and non-residential structures. This effort will also involve the discussion of protecting homes from the effects of urban fire hazards. ▸ The Town will consider the Hazard Mitigation Plan, and all information documented within the plan, when making decisions regarding future infrastructure improvements. ▸ The Town will continue to enforces its zoning regulations and implement the Pembroke Land Use Plan in portions of the Town that are undeveloped and susceptible to the effects of natural hazards.
Strategy Type	Property protection
Hazard(s) Addressed	Hurricane, Tornado, Flooding, Wildfire
Objective(s) Addressed	3.3
Priority	High
Possible Funding Sources	This effort will be funded through existing staff and budget resources.
Responsible Party	Town Manager
Projected Completion Date	Ongoing and Annually
Notes/Background	It should be noted that Robeson County, through an existing interlocal agreement, provides floodplain development review and inspections to the Town of Pembroke. This strategy will not impact this agreement or the provision of planning and inspection services by the County.

SECTION 6: PLAN MAINTENANCE AND IMPLEMENTATION PROCEDURES

A. Implementation

Implementation of the Town of Pembroke Hazard Mitigation Plan will commence with adoption of the document by the Town Council. The Resolution of Adoption has been provided as Appendix C of the plan (to be added upon adoption).

Upon adoption, the Town of Pembroke Hazard Mitigation Plan faces the truest test of its worth, implementation. Implementation implies two concepts: action and priority. These are closely related. While this plan puts forth many worthwhile and high priority recommendations, the decision about which action to undertake first will be the first task facing the Mitigation Advisory Committee (MAC). There are two factors to consider in making that decision; the priority of the item and available funding. Thus, pursuing low or no-cost high-priority recommendations will have the greatest likelihood of success.

Another important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other town plans and regulatory mechanisms, such as the Unified Development Ordinance and Land Use Plan. The Town will utilize this plan as a starting point toward implementing policies and programs to reduce losses to life and property from natural hazards.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. This integration is accomplished by constant efforts to network, identify, and highlight the multi-objective benefits to each program, and its stakeholders. This effort is achieved through the routine actions of monitoring implementation efforts, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and review of town and county (Robeson) programs for coordination and regional multi-objective opportunities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This will include creating and maintaining a bank of ideas on how

any required local match or participation requirement can be met. When funding does become available, the MAC will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, special district budgeted funds, state or federal earmarked funds, and grant programs, including those that can serve or support multi-objective implementing actions.

B. Role of the Mitigation Advisory Committee in Implementation and Maintenance

With adoption of this plan, the MAC will be tasked with plan implementation and maintenance. The MAC, led by Channing Jones, Pembroke Deputy Town Manager, agrees to:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Continuously monitor multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Report on plan progress and recommended changes to the Pembroke Town Council; and
- Inform and solicit input from the public.

The MAC will not have any powers over Town staff; it will be purely an advisory body. Its primary duty is to see the plan successfully carried out and to report to the community governing board and the public on the status of plan implementation and mitigation opportunities for the Town. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the Town website.

C. Evaluation, Monitoring, and Updating

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to update the plan as progress, roadblocks, or changing circumstances are recognized.

In order to track progress and update the mitigation strategies identified in the policy section of the plan, the Town will revisit this plan on a bi-annual basis and after a hazard event. This bi-annual review will involve a MAC meeting called by the Town Manager to review and discuss the policy initiatives outlined in this plan. The Town of Pembroke Administration is responsible for initiating this review and will consult with members of the MAC. This monitoring and updating will take place through a formal review by the MAC twice annually, and a five-year written update to be submitted to the NCEM and FEMA Region IV, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule.

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or annexation).

Updates to this plan will:

- Consider changes in vulnerability due to project implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to Town inventories; and

- Incorporate new project recommendations or changes in project prioritization.

In order to best evaluate any changes in vulnerability as a result of plan implementation, the MAC will use the following process:

- A representative from the responsible office identified in each mitigation action will be responsible for tracking and reporting on a bi-annual basis to the MAC on project status and provide input on whether the project as implemented meets the defined objectives and is likely to be successful in reducing vulnerabilities.

- If the project does not meet identified objectives, the MAC will determine what additional measures may be implemented and an assigned individual will be responsible for defining project scope, implementing the project, monitoring success of the project, and making any required modifications to the plan.

Changes will be made to the plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with established criteria, the time frame, Town priorities, and/or funding resources. Priorities that were identified as potential mitigation strategies will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation.

Updating of the plan will be by written changes and submissions, as the MAC deems appropriate and necessary, and as approved by the Pembroke Town Council. In keeping with the process of adopting the plan, a public involvement process to receive public comment on plan maintenance and updating will be held once annually, and the final product will be adopted by the Town Council.

D. Continued Public Involvement

Continued public involvement is also imperative to the overall success of the plan's implementation. The update process provides an opportunity to publicize success stories from
plan implementation and seek additional public comment. A public hearing(s) to receive public comment on plan maintenance and updating will be held once within the context of the defined bi-annual review process. When the MAC reconvenes for updates, they will coordinate with all stakeholders participating in the planning process – including those that joined the committee since the planning process began (if applicable). The plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, and press releases to local media.

E. Incorporation of Existing Planning Mechanisms

The mitigation actions in Section 6 of this plan recommends using existing plans and/or programs to implement hazard mitigation in the Town, where possible. This point is also emphasized previously in this Section. Based on this plan's capability assessment, the Town has and continues to implement policies and programs to reduce losses to life and property from natural hazards. This plan builds upon the momentum developed through previous and related planning efforts and recommends implementing projects. Worksheet #3 (page 95) provides an overview of how mitigation measures may be incorporated into existing Town-maintained planning and development documents.

APPENDIX A. MAC MEETING DOCUMENTATION

TOWN OF PEMBROKE
HAZARD MITIGATION PLAN

NOTICE OF MITIGATION ADVISORY COMMITTEE MEETING

Notice is hereby given that the Town of Pembroke Mitigation Advisory Committee will conduct a meeting on November 17, 2009, at 10:00 a.m., at the Pembroke Town Hall, 100 South Union Chapel Road, Pembroke, NC.

The purpose of the meeting will be to discuss information regarding the town's Hazard Mitigation Plan update. All interested citizens, business owners, officials from neighboring jurisdictions, and other governmental entities are encouraged to attend. For additional information, please contact the Town Hall at (910) 521-9758.

TOWN OF PEMBROKE
HAZARD MITIGATION PLAN

NOTICE OF MITIGATION ADVISORY COMMITTEE MEETING

Notice is hereby given that the Town of Pembroke Mitigation Advisory Committee will conduct a meeting on January 19, 2010, at 10:00 a.m., at the Pembroke Town Hall, 100 South Union Chapel Road, Pembroke, NC.

The purpose of the meeting will be to discuss information regarding the town's Hazard Mitigation Plan update. All interested citizens, business owners, officials from neighboring jurisdictions, and other governmental entities are encouraged to attend. For additional information, please contact the Town Hall at (910) 521-9758.

Town of Pembroke Hazard Mitigation Plan

Public Information Meeting

The Town of Pembroke will hold a public information meeting to

address the Town's Hazard Mitigation Plan update.

Please come and help the Town

prepare for potential disaster events through comprehensive planning.

Where: Pembroke Town Hall,

100 S. Union Chapel Road, Pembroke, NC

When: January 4, 2010 at 7:00 PM

Please direct questions to:

McDuffie Cummings, Town Manager at 910-521-9758

APPENDIX B. DATA DOCUMENTATION

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
189 NCZ087 - 099>100	8/25/1999	10:00 AM	Drought	N/A	0	0	0	0
238 NCZ087 - 096>097 - 099>101	11/15/2001	8:00 AM	Drought	N/A	0	0	0	0
249 NCZ087 - 096>097 - 099>101	6/1/2002	12:00 AM	Drought	N/A	0	0	0	0
325 NCZ087 - 096 - 099	8/12/2007	12:00 AM	Drought	N/A	0	0	0K	0K
328 NCZ087 - 096 - 099	10/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
329 NCZ087 - 096 - 099	11/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
332 NCZ087 - 096 - 099	12/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
333 NCZ087 - 096 - 099	1/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
334 NCZ087 - 096 - 099	2/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
335 NCZ087	3/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
342 NCZ087	4/1/2008	12:00 AM	Drought	N/A	0	0	0K	0K
156 NCZ087	7/28/1997	2:00 PM	Excessive Heat	N/A	1	0	0	0
110 Statewide	1/15/1994	0	Extreme Cold	N/A	3	0	500K	0
111 Statewide	1/19/1994	0	Extreme Cold	N/A	6	0	0	0
114 Fairmont	8/19/1994	200	Flash Flood	N/A	0	0	0	0
158 Rowland	2/3/1998	7:30 PM	Flash Flood	N/A	0	0	0	0
170 Maxton	7/31/1998	3:45 PM	Flash Flood	N/A	0	0	0	0
172 Pembroke	8/30/1998	11:30 PM	Flash Flood	N/A	0	0	0	0
126 ROBESON	6/23/1995	2000	Flash Flood - Heavy Rain	N/A	0	0	2K	0
125 ROBESON	6/22/1995	2000	Flash Flood/ Street	N/A	0	0	2K	0
109 NCZ001>510	3/23/1993	1200	Flash Floods	N/A	0	0	0	0
191 Orrum	9/16/1999	1:30 AM	Flood	N/A	0	0	0	0
227 St Pauls	6/15/2001	8:25 PM	Flood	N/A	0	0	0	0
229 Lumberton	6/16/2001	5:29 PM	Flood	N/A	0	0	0	0
364 Lumberton	9/9/2008	14:00 PM	Flood	N/A	0	0	0K	0K
193 NCZ087 - 096>097 - 099	1/22/2000	6:00 PM	Freezing Rain	N/A	0	0	0	0
320 NCZ087 - 096 - 097	4/8/2007	1:00 AM	Frost/freeze	N/A	0	0	0K	0K
296 Raemon	9/16/2004	3:30 PM	Funnel Cloud	N/A	0	0	0	0
297 Pembroke	9/16/2004	4:25 PM	Funnel Cloud	N/A	0	0	0	0
8 ROBESON	6/14/1962	1600	Hail	2.00 in.	0	0	0	0
10 ROBESON	5/17/1963	1800	Hail	1.50 in.	0	0	0	0
14 ROBESON	3/17/1965	1500	Hail	2.75 in.	0	0	0	0
21 ROBESON	2/7/1971	1115	Hail	1.00 in.	0	0	0	0
22 ROBESON	6/16/1971	1655	Hail	2.00 in.	0	0	0	0
34 ROBESON	6/19/1979	1830	Hail	1.00 in.	0	0	0	0
50 ROBESON	5/8/1984	1545	Hail	1.00 in.	0	0	0	0
54 ROBESON	9/4/1984	1415	Hail	0.75 in.	0	0	0	0
55 ROBESON	9/4/1984	1430	Hail	0.75 in.	0	0	0	0
56 ROBESON	9/4/1984	1435	Hail	1.75 in.	0	0	0	0
58 ROBESON	3/24/1985	1337	Hail	0.75 in.	0	0	0	0
59 ROBESON	5/16/1985	1510	Hail	0.75 in.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
60 ROBESON	5/16/1985	1530	Hail	0.88 in.	0	0	0	0
61 ROBESON	6/7/1985	1850	Hail	1.00 in.	0	0	0	0
64 ROBESON	3/13/1986	1355	Hail	0.75 in.	0	0	0	0
65 ROBESON	5/25/1986	1225	Hail	1.00 in.	0	0	0	0
66 ROBESON	5/25/1986	1300	Hail	2.00 in.	0	1	0	0
67 ROBESON	5/25/1986	1530	Hail	1.75 in.	0	0	0	0
68 ROBESON	5/25/1986	1545	Hail	0.75 in.	0	0	0	0
71 ROBESON	6/24/1986	1628	Hail	1.00 in.	0	0	0	0
72 ROBESON	6/24/1986	1650	Hail	0.75 in.	0	0	0	0
78 ROBESON	7/13/1986	2100	Hail	0.75 in.	0	0	0	0
82 ROBESON	7/29/1987	800	Hail	1.75 in.	0	0	0	0
85 ROBESON	8/29/1987	1600	Hail	0.75 in.	0	0	0	0
87 ROBESON	5/19/1988	1630	Hail	1.75 in.	0	0	0	0
97 ROBESON	4/30/1990	2030	Hail	1.75 in.	0	0	0	0
99 ROBESON	4/30/1990	2230	Hail	0.75 in.	0	0	0	0
106 ROBESON	3/19/1992	1500	Hail	1.75 in.	0	0	0	0
107 ROBESON	3/19/1992	1516	Hail	0.75 in.	0	0	0	0
112 ROBESON	5/1/1994	1524	Hail	0.75 in.	0	0	0	0
113 ROBESON	5/1/1994	1615	Hail	1.00 in.	0	0	0	0
116 Maxton	3/23/1995	1735	Hail	0.75 in.	0	0	0	0
117 Lumberton 3 S	3/23/1995	1745	Hail	0.75 in.	0	0	0	0
130 Parkton	7/11/1995	1700	Hail	0.75 in.	0	0	0	0
138 St Pauls	4/15/1996	3:45 PM	Hail	0.75 in.	0	0	0	0
150 St Pauls	4/21/1997	5:40 PM	Hail	1.15 in.	0	0	0	0
151 Orrum	6/14/1997	12:40 PM	Hail	0.75 in.	0	0	0	0
154 Lumberton	7/5/1997	6:19 PM	Hail	0.88 in.	0	0	0	0
155 Lumberton	7/16/1997	5:40 PM	Hail	0.88 in.	0	0	0	0
162 Fairmont	3/20/1998	8:40 PM	Hail	1.00 in.	0	0	0	0
164 Lumberton	5/4/1998	1:30 PM	Hail	1.00 in.	0	0	0	0
173 Rowland	2/28/1999	3:10 PM	Hail	1.00 in.	0	0	0	0
174 Fairmont	2/28/1999	3:35 PM	Hail	0.75 in.	0	0	0	0
181 Fairmont	5/6/1999	3:40 PM	Hail	1.75 in.	0	0	0	0
182 Fairmont	5/13/1999	6:25 PM	Hail	0.88 in.	0	0	0	0
183 Fairmont	5/14/1999	2:30 PM	Hail	0.88 in.	0	0	0	0
185 Fairmont	7/24/1999	6:40 PM	Hail	0.88 in.	0	0	0	0
196 Lumberton	4/17/2000	10:35 PM	Hail	0.75 in.	0	0	0	0
197 Fairmont	4/17/2000	10:40 PM	Hail	1.00 in.	0	0	0	0
198 Fairmont	4/28/2000	1:27 PM	Hail	0.75 in.	0	0	0	0
199 Red Spgs	4/28/2000	3:55 PM	Hail	0.75 in.	0	0	0	0
204 Lumberton	6/3/2000	6:40 PM	Hail	0.75 in.	0	0	0	0
205 Barnesville	6/3/2000	8:35 PM	Hail	1.75 in.	0	0	0	0
206 Pembroke	6/14/2000	4:20 PM	Hail	1.75 in.	0	0	0	0
207 Rowland	6/14/2000	4:40 PM	Hail	1.75 in.	0	0	0	0
208 Powers	6/22/2000	3:45 PM	Hail	0.75 in.	0	0	0	0
209 Pembroke	6/22/2000	3:58 PM	Hail	0.75 in.	0	0	0	0
210 Lumberton	7/16/2000	7:00 PM	Hail	0.75 in.	0	0	0	0
211 St Pauls	7/16/2000	7:00 PM	Hail	1.75 in.	0	0	0	0
214 Lumber Bridge	8/18/2000	5:05 PM	Hail	0.75 in.	0	0	0	0
219 Orrum	4/1/2001	1:21 PM	Hail	0.75 in.	0	0	0	0
231 Lumberton	6/22/2001	5:40 PM	Hail	0.75 in.	0	0	0	0
236 Barnesville	8/28/2001	1:50 PM	Hail	0.88 in.	0	0	0	0
242 Lumberton	3/31/2002	2:54 PM	Hail	0.75 in.	0	0	0	0
243 St Pauls	3/31/2002	3:15 PM	Hail	0.75 in.	0	0	0	0
244 Lumberton	3/31/2002	4:09 PM	Hail	1.75 in.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
245 Lumberton	3/31/2002	6:15 PM	Hail	0.75 in.	0	0	0	0
251 Rennert	7/31/2002	6:08 PM	Hail	1.25 in.	0	0	0	0
257 Orrum	3/6/2003	1:45 AM	Hail	0.75 in.	0	0	0	0
261 Pembroke	5/3/2003	6:22 PM	Hail	1.25 in.	0	0	0	0
262 Orrum	5/3/2003	6:30 PM	Hail	0.75 in.	0	0	0	0
263 Maxton	5/3/2003	6:38 PM	Hail	1.00 in.	0	0	0	0
264 Lumberton	5/3/2003	6:41 PM	Hail	1.75 in.	0	0	25K	50K
265 Fairmont	5/3/2003	7:30 PM	Hail	0.75 in.	0	0	0	0
266 Fairmont	5/3/2003	8:00 PM	Hail	0.75 in.	0	0	0	0
267 Proctorville	5/3/2003	8:14 PM	Hail	1.25 in.	0	0	0	0
268 Fairmont	5/3/2003	8:30 PM	Hail	0.88 in.	0	0	0	0
269 Fairmont	5/25/2003	1:25 PM	Hail	0.75 in.	0	0	0	0
273 Red Spgs	5/31/2003	5:10 PM	Hail	0.75 in.	0	0	0	0
275 Pembroke	5/31/2003	6:34 PM	Hail	0.88 in.	0	0	0	0
284 Lumberton	4/11/2004	5:08 PM	Hail	0.88 in.	0	0	0	0
285 Lumberton	4/11/2004	5:14 PM	Hail	0.75 in.	0	0	0	0
286 Tolarsville	5/8/2004	6:00 PM	Hail	0.75 in.	0	0	0	0
288 Lumberton	5/23/2004	4:45 PM	Hail	0.75 in.	0	0	0	0
303 Marietta	4/3/2006	5:10 PM	Hail	0.75 in.	0	0	0	0
305 Lumberton	5/5/2006	3:08 PM	Hail	0.88 in.	0	0	0	0
306 Pembroke	5/20/2006	10:34 PM	Hail	0.75 in.	0	0	0	0
308 Lumberton	5/26/2006	3:22 PM	Hail	0.88 in.	0	0	0	0
309 Lumberton	5/26/2006	7:20 PM	Hail	0.75 in.	0	0	0	0
310 Red Spgs	5/26/2006	8:00 PM	Hail	0.88 in.	0	0	0	0
311 Lumberton	6/8/2006	3:02 PM	Hail	0.88 in.	0	0	0	0
314 Lumberton	6/12/2006	2:04 PM	Hail	0.75 in.	0	0	0	0
321 Marietta	6/12/2007	17:40 PM	Hail	0.88 in.	0	0	0K	0K
322 Lumberton	6/13/2007	14:17 PM	Hail	0.88 in.	0	0	0K	0K
323 Lumberton	6/13/2007	14:20 PM	Hail	1.00 in.	0	0	0K	0K
339 Daystrom	3/15/2008	17:00 PM	Hail	1.00 in.	0	0	0K	0K
340 Orrum	3/15/2008	17:14 PM	Hail	1.75 in.	0	0	0K	0K
343 Allenton	5/11/2008	18:55 PM	Hail	1.00 in.	0	0	0K	0K
349 St Pauls	6/9/2008	19:49 PM	Hail	0.75 in.	0	0	0K	0K
350 Powers	6/9/2008	20:05 PM	Hail	0.88 in.	0	0	0K	0K
351 Powers	6/9/2008	20:30 PM	Hail	0.88 in.	0	0	0K	0K
354 Fairmont	6/17/2008	16:28 PM	Hail	0.75 in.	0	0	0K	0K
355 Raynham	6/20/2008	13:40 PM	Hail	1.00 in.	0	0	0K	0K
359 Smiths	7/31/2008	17:20 PM	Hail	0.75 in.	0	0	0K	0K
365 Pembroke	10/1/2008	14:57 PM	Hail	0.75 in.	0	0	0K	0K
374 Lumberton Muni Arpt	5/11/2009	7:49 AM	Hail	0.75 in.	0	0	0K	0K
376 Fairmont	5/29/2009	17:46 PM	Hail	1.13 in.	0	0	0K	0K
377 Marietta	5/29/2009	18:55 PM	Hail	0.75 in.	0	0	0K	0K
279 Lumberton	7/13/2003	7:00 PM	Heavy Rain	N/A	0	0	0	0
302 Fairmont	10/6/2005	2:30 PM	Heavy Rain	N/A	0	0	0	0
378 Fairmont	6/5/2009	20:08 PM	Heavy Rain	N/A	0	0	0K	0K
380 St Pauls	8/14/2009	22:25 PM	Heavy Rain	N/A	0	0	0K	0K
367 NCZ087	1/20/2009	7:00 AM	Heavy Snow	N/A	0	0	0K	0K
146 NCZ087	9/5/1996	3:00 PM	High Wind	63 kts.	0	2	24.0M	33.0M
171 NCZ087	8/26/1998	3:00 PM	High Wind	50 kts.	0	0	0	0
175 NCZ087	3/3/1999	2:50 PM	High Wind	65 kts.	0	4	120K	0
190 NCZ087 - 096 - 099	9/15/1999	11:00 PM	High Wind	65 kts.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
218 NCZ087 - 097 - 099>101	12/17/2000	8:30 AM	High Wind	52 kts.	0	2	50K	0
253 NCZ087	12/4/2002	4:00 PM	Ice Storm	N/A	0	0	0	0
255 NCZ087 - 096	2/17/2003	1:00 AM	Ice Storm	N/A	0	0	0	0
280 NCZ087 - 096	1/25/2004	2:00 PM	Ice Storm	N/A	0	0	2.5M	0
281 NCZ087 - 096>097 - 099	1/26/2004	11:00 AM	Ice Storm	N/A	0	0	13.0M	0
188 Barnesville	8/14/1999	4:00 PM	Lightning	N/A	0	0	0	0
225 St Pauls	5/27/2001	9:00 AM	Lightning	N/A	0	0	40K	0
235 Red Spgs	8/18/2001	2:00 PM	Lightning	N/A	0	0	0	0
237 Lumberton	8/28/2001	2:30 PM	Lightning	N/A	0	1	300K	0
307 St Pauls	5/26/2006	3:20 PM	Lightning	N/A	0	0	15K	0
192 NCZ087 - 096>097 - 099>101	1/17/2000	11:00 PM	Snow	N/A	0	0	0	0
120 ROBESON	6/9/1995	1919	Thunderstorm Wind	0 kts.	0	0	0	3K
122 ROBESON	6/11/1995	1730	Thunderstorm Wind	0 kts.	0	0	2K	0
123 ROBESON	6/12/1995	1615	Thunderstorm Wind	0 kts.	0	0	1K	0
124 ROBESON	6/12/1995	1655	Thunderstorm Wind	0 kts.	0	0	2K	0
319 Lumberton	3/2/2007	5:00 AM	Thunderstorm Wind	61 kts.	0	0	0K	0K
324 Red Spgs	6/29/2007	15:28 PM	Thunderstorm Wind	60 kts.	0	0	0K	0K
326 Lumberton	8/29/2007	15:55 PM	Thunderstorm Wind	60 kts.	0	0	50K	0K
327 Lumberton	9/14/2007	23:38 PM	Thunderstorm Wind	60 kts.	0	0	0K	0K
336 Red Spgs	3/4/2008	22:45 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
337 Orrum	3/4/2008	23:00 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
338 Lumberton	3/4/2008	23:10 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
341 Raynham	3/15/2008	17:41 PM	Thunderstorm Wind	56 kts.	0	0	0K	0K
344 Parkton	5/20/2008	18:20 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
345 Rowland	6/1/2008	16:37 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
346 East Lumberton	6/1/2008	17:10 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
347 Allenton	6/1/2008	17:12 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
348 St Pauls	6/9/2008	19:30 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
352 Powers	6/9/2008	20:30 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
353 Lowe	6/11/2008	17:30 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
356 Lumberton Muni Arpt	7/30/2008	19:08 PM	Thunderstorm Wind	55 kts.	0	0	0K	0K

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
357 East Lumberton	7/30/2008	19:10 PM	Thunderstorm Wind	61 kts.	0	0	0K	0K
358 Fairmont	7/30/2008	19:10 PM	Thunderstorm Wind	55 kts.	0	0	0K	0K
360 Smiths	7/31/2008	17:20 PM	Thunderstorm Wind	52 kts.	0	0	0K	0K
361 Pembroke	8/2/2008	19:00 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
362 Powers	8/2/2008	19:37 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
363 Barnesville	8/2/2008	19:50 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
370 Raemon	5/11/2009	7:24 AM	Thunderstorm Wind	61 kts.	0	0	30K	0K
371 Raemon	5/11/2009	7:25 AM	Thunderstorm Wind	61 kts.	0	0	15K	0K
372 Maxton	5/11/2009	7:35 AM	Thunderstorm Wind	61 kts.	0	0	5K	0K
373 Raynham	5/11/2009	7:40 AM	Thunderstorm Wind	61 kts.	0	0	15K	0K
375 Allenton	5/11/2009	7:58 AM	Thunderstorm Wind	109 kts.	0	1	813K	0K
379 Fairmont	7/16/2009	15:05 PM	Thunderstorm Wind	50 kts.	0	0	1K	0K
127 ROBESON	6/26/1995	1505	Thunderstorm Wind 59 Mph.	0 kts.	0	0	0	0
121 ROBESON	6/11/1995	1725	Thunderstorm Wind.	0 kts.	0	0	0	3K
115 ROBESON	1/6/1995	2345	Thunderstorm Winds	0 kts.	0	0	15K	0
118 St Pauls	5/15/1995	1626	Thunderstorm Winds	0 kts.	0	0	20	0
119 Red Springs	5/15/1995	1645	Thunderstorm Winds	0 kts.	0	0	500K	0
128 Lumberton	7/10/1995	1835	Thunderstorm Winds	0 kts.	0	0	0	0
129 Lumberton	7/10/1995	1835	Thunderstorm Winds	0 kts.	0	0	0	0
131 Raynham	7/18/1995	1550	Thunderstorm Winds	0 kts.	0	0	0	0
132 Lumberton	7/18/1995	1600	Thunderstorm Winds	0 kts.	0	0	0	0
133 Rowland	7/18/1995	1600	Thunderstorm Winds	0 kts.	0	0	0	0
134 Lumberton	10/5/1995	600	Thunderstorm Winds	50 kts.	0	0	3K	0
136 Marietta	11/11/1995	1840	Thunderstorm Winds	0 kts.	0	0	0	0
137 Lumberton	11/11/1995	1845	Thunderstorm Winds	0 kts.	0	0	0	0
2 ROBESON	4/8/1957	1900	Tornado	F4	0	6	250K	0
3 ROBESON	4/8/1957	1900	Tornado	F4	0	21	250K	0
5 ROBESON	2/27/1958	1500	Tornado	F0	0	0	3K	0
9 ROBESON	2/19/1963	700	Tornado	F1	0	0	3K	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
11 ROBESON	7/19/1963	1700	Tornado	F2	0	0	25K	0
12 ROBESON	9/29/1963	200	Tornado	F2	0	0	250K	0
13 ROBESON	8/30/1964	300	Tornado	F1	0	0	25K	0
24 ROBESON	2/16/1975	1530	Tornado	F1	0	1	25K	0
25 ROBESON	5/15/1975	1710	Tornado	F1	0	0	3K	0
26 ROBESON	5/15/1975	1747	Tornado	F1	0	0	25K	0
28 ROBESON	5/15/1976	1550	Tornado	F2	3	4	250K	0
29 ROBESON	3/4/1977	1245	Tornado	F0	0	0	25K	0
30 ROBESON	3/4/1977	1315	Tornado	F1	0	4	250K	0
31 ROBESON	4/19/1978	1700	Tornado	F1	0	0	3K	0
32 ROBESON	6/3/1978	1500	Tornado	F1	0	0	3K	0
33 ROBESON	3/23/1979	2240	Tornado	F2	0	9	250K	0
37 ROBESON	8/21/1979	1700	Tornado	F0	0	0	0K	0
38 ROBESON	5/20/1980	1342	Tornado	F1	0	0	25K	0
46 ROBESON	3/28/1984	1840	Tornado	F4	2	280	2.5M	0
135 Lowe	11/7/1995	1700	Tornado	F0	0	0	0	0
147 Lumberton	9/6/1996	9:00 PM	Tornado	F0	0	0	0	0
149 Barnesville	9/16/1996	7:10 PM	Tornado	F0	0	0	0	0
153 St Pauls	7/5/1997	5:50 PM	Tornado	F1	0	0	20K	0
159 Lumberton	3/8/1998	2:38 PM	Tornado	F0	0	0	10K	0
160 Lumberton	3/8/1998	3:03 PM	Tornado	F1	0	3	100K	0
163 Proctorville	3/20/1998	8:45 PM	Tornado	F1	0	1	20K	0
178 Pembroke	4/15/1999	7:15 PM	Tornado	F2	1	4	200K	0
180 Lumberton	4/15/1999	7:30 PM	Tornado	F1	0	0	20K	0
234 Fairmont	8/18/2001	1:45 PM	Tornado	F0	0	0	25K	0
292 Orrum	9/7/2004	1:05 PM	Tornado	F0	0	0	0	0
293 Lumberton	9/7/2004	1:47 PM	Tornado	F0	0	0	0	0
294 Marietta	9/7/2004	2:53 PM	Tornado	F1	0	0	200K	0
295 Marietta	9/7/2004	5:10 PM	Tornado	F0	0	0	3K	0
366 St Pauls	11/15/2008	1:35 AM	Tornado	F0	0	0	50K	0K
368 Allenton	3/27/2009	15:32 PM	Tornado	F0	0	0	5K	0K
369 Mc Millan	3/27/2009	16:02 PM	Tornado	F2	0	1	35K	0K
291 NCZ087 - 096 - 099>101	8/29/2004	4:00 PM	Tropical Storm	N/A	0	0	0	0
1 ROBESON	8/6/1956	1530	Tstm Wind	0 kts.	0	0	0	0
4 ROBESON	6/28/1957	1630	Tstm Wind	58 kts.	0	0	0	0
6 ROBESON	5/27/1960	1540	Tstm Wind	0 kts.	0	0	0	0
7 ROBESON	5/9/1961	1300	Tstm Wind	0 kts.	0	0	0	0
15 ROBESON	3/17/1965	1500	Tstm Wind	0 kts.	0	0	0	0
16 ROBESON	12/7/1968	1800	Tstm Wind	0 kts.	0	0	0	0
17 ROBESON	4/18/1969	1525	Tstm Wind	0 kts.	0	0	0	0
18 ROBESON	8/10/1969	1300	Tstm Wind	0 kts.	0	0	0	0
19 ROBESON	4/2/1970	1040	Tstm Wind	0 kts.	0	0	0	0
20 ROBESON	6/21/1970	1400	Tstm Wind	0 kts.	0	0	0	0
23 ROBESON	6/16/1971	1655	Tstm Wind	60 kts.	0	0	0	0
27 ROBESON	7/4/1975	1330	Tstm Wind	0 kts.	0	0	0	0
35 ROBESON	6/19/1979	1830	Tstm Wind	0 kts.	0	0	0	0
36 ROBESON	8/21/1979	1400	Tstm Wind	61 kts.	0	0	0	0
39 ROBESON	2/11/1981	230	Tstm Wind	0 kts.	0	0	0	0
40 ROBESON	5/27/1981	2130	Tstm Wind	0 kts.	0	0	0	0
41 ROBESON	7/20/1982	1330	Tstm Wind	0 kts.	0	0	0	0
42 ROBESON	5/16/1983	1700	Tstm Wind	0 kts.	0	0	0	0
43 ROBESON	7/3/1983	1600	Tstm Wind	0 kts.	0	0	0	0
44 ROBESON	8/23/1983	1615	Tstm Wind	0 kts.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
45 ROBESON	3/20/1984	2230	Tstm Wind	0 kts.	0	0	0	0
47 ROBESON	4/4/1984	1815	Tstm Wind	0 kts.	0	0	0	0
48 ROBESON	4/4/1984	1900	Tstm Wind	0 kts.	0	0	0	0
49 ROBESON	4/30/1984	1640	Tstm Wind	0 kts.	0	0	0	0
51 ROBESON	5/8/1984	1545	Tstm Wind	0 kts.	0	0	0	0
52 ROBESON	5/8/1984	1742	Tstm Wind	0 kts.	0	0	0	0
53 ROBESON	6/20/1984	1640	Tstm Wind	0 kts.	0	0	0	0
57 ROBESON	9/4/1984	1435	Tstm Wind	0 kts.	0	0	0	0
62 ROBESON	6/7/1985	1900	Tstm Wind	0 kts.	0	0	0	0
63 ROBESON	2/19/1986	1821	Tstm Wind	0 kts.	0	0	0	0
69 ROBESON	6/14/1986	1526	Tstm Wind	0 kts.	0	0	0	0
70 ROBESON	6/20/1986	1700	Tstm Wind	0 kts.	0	0	0	0
73 ROBESON	6/24/1986	1800	Tstm Wind	0 kts.	0	0	0	0
74 ROBESON	6/28/1986	1743	Tstm Wind	0 kts.	0	0	0	0
75 ROBESON	7/8/1986	1700	Tstm Wind	0 kts.	0	1	0	0
76 ROBESON	7/8/1986	1730	Tstm Wind	0 kts.	0	0	0	0
77 ROBESON	7/10/1986	1640	Tstm Wind	0 kts.	0	0	0	0
79 ROBESON	7/21/1986	1335	Tstm Wind	0 kts.	0	0	0	0
80 ROBESON	8/3/1986	1500	Tstm Wind	0 kts.	0	1	0	0
81 ROBESON	5/2/1987	1827	Tstm Wind	50 kts.	0	0	0	0
83 ROBESON	8/29/1987	1440	Tstm Wind	0 kts.	0	0	0	0
84 ROBESON	8/29/1987	1505	Tstm Wind	0 kts.	0	0	0	0
86 ROBESON	5/17/1988	1325	Tstm Wind	0 kts.	0	0	0	0
88 ROBESON	5/24/1988	1545	Tstm Wind	0 kts.	0	0	0	0
89 ROBESON	5/24/1988	1600	Tstm Wind	0 kts.	0	0	0	0
90 ROBESON	5/24/1988	1630	Tstm Wind	0 kts.	0	0	0	0
91 ROBESON	7/16/1988	1530	Tstm Wind	0 kts.	0	0	0	0
92 ROBESON	7/22/1988	1535	Tstm Wind	0 kts.	0	0	0	0
93 ROBESON	6/15/1989	1650	Tstm Wind	0 kts.	0	0	0	0
94 ROBESON	6/16/1989	1515	Tstm Wind	0 kts.	0	0	0	0
95 ROBESON	6/20/1989	1030	Tstm Wind	0 kts.	0	0	0	0
96 ROBESON	2/16/1990	1448	Tstm Wind	0 kts.	0	0	0	0
98 ROBESON	4/30/1990	2030	Tstm Wind	0 kts.	0	0	0	0
100 ROBESON	7/8/1990	1850	Tstm Wind	0 kts.	0	0	0	0
101 ROBESON	8/29/1990	1855	Tstm Wind	0 kts.	0	0	0	0
102 ROBESON	8/29/1990	1855	Tstm Wind	0 kts.	0	0	0	0
103 ROBESON	8/29/1990	1900	Tstm Wind	0 kts.	0	0	0	0
104 ROBESON	6/19/1991	2220	Tstm Wind	0 kts.	0	0	0	0
105 ROBESON	8/9/1991	1634	Tstm Wind	0 kts.	0	0	0	0
139 St Pauls	5/11/1996	4:10 PM	Tstm Wind	52 kts.	0	0	0	0
140 Fairmont	5/29/1996	7:15 PM	Tstm Wind	52 kts.	0	0	0	0
141 St Pauls	5/29/1996	7:30 PM	Tstm Wind	60 kts.	0	0	0	0
143 Maxton	7/15/1996	5:00 PM	Tstm Wind	60 kts.	0	0	0	0
144 Mc Donalds	7/22/1996	4:00 PM	Tstm Wind	55 kts.	0	0	0	0
145 Maxton	7/30/1996	2:20 PM	Tstm Wind	60 kts.	0	0	0	0
148 Fairmont	9/8/1996	5:20 PM	Tstm Wind	60 kts.	0	0	0	0
152 Red Spgs	7/5/1997	5:25 PM	Tstm Wind	60 kts.	0	0	0	0
157 Orrum	8/18/1997	2:15 PM	Tstm Wind	60 kts.	0	0	0	0
161 Maxton	3/20/1998	5:42 PM	Tstm Wind	60 kts.	0	0	2K	0
165 Lumber Bridge	5/27/1998	4:05 PM	Tstm Wind	70 kts.	0	0	80K	0
166 Parkton	6/13/1998	2:10 PM	Tstm Wind	65 kts.	0	0	10K	0
167 Fairmont	6/15/1998	7:10 PM	Tstm Wind	70 kts.	0	0	40K	0
168 Rennert	6/29/1998	4:40 PM	Tstm Wind	60 kts.	0	0	0	0
169 Maxton	6/30/1998	7:55 PM	Tstm Wind	65 kts.	0	0	5K	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
176 Maxton	4/15/1999	7:10 PM	Tstm Wind	70 kts.	0	2	40K	0
177 Pembroke	4/15/1999	7:13 PM	Tstm Wind	70 kts.	0	0	5K	0
179 Lumberton	4/15/1999	7:20 PM	Tstm Wind	70 kts.	0	0	50K	0
184 Fairmont	6/10/1999	6:15 PM	Tstm Wind	70 kts.	0	0	5K	0
186 Lumberton	8/1/1999	6:30 PM	Tstm Wind	70 kts.	0	0	10K	0
187 Maxton	8/14/1999	3:45 PM	Tstm Wind	70 kts.	0	0	10K	0
195 Fairmont	4/8/2000	3:55 PM	Tstm Wind	55 kts.	0	0	0	0
200 Rowland	5/27/2000	3:20 PM	Tstm Wind	65 kts.	0	0	100K	0
201 Fairmont	5/27/2000	3:45 PM	Tstm Wind	60 kts.	0	0	0	0
202 Pembroke	5/28/2000	11:55 AM	Tstm Wind	65 kts.	0	0	0	0
203 Fairmont	5/28/2000	12:10 PM	Tstm Wind	55 kts.	0	0	0	0
212 Marietta	7/22/2000	3:30 PM	Tstm Wind	65 kts.	0	0	0	0
213 Fairmont	7/22/2000	3:45 PM	Tstm Wind	55 kts.	0	0	0	0
215 Fairmont	8/18/2000	5:30 PM	Tstm Wind	60 kts.	0	0	0	0
216 Orrum	8/18/2000	6:01 PM	Tstm Wind	60 kts.	0	0	0	0
220 Wakulla	4/1/2001	1:25 PM	Tstm Wind	60 kts.	0	0	0	0
221 Red Spgs	4/1/2001	1:30 PM	Tstm Wind	78 kts.	0	0	300K	0
222 Pembroke	4/1/2001	12:49 PM	Tstm Wind	52 kts.	0	0	0	0
223 Lumberton	4/1/2001	12:57 PM	Tstm Wind	51 kts.	0	0	0	0
224 Red Spgs	5/12/2001	4:55 PM	Tstm Wind	60 kts.	0	0	5K	0
226 Barnesville	6/1/2001	1:15 PM	Tstm Wind	61 kts.	0	0	25K	0
228 Lumberton	6/16/2001	4:35 PM	Tstm Wind	70 kts.	0	0	50K	0
230 Fairmont	6/22/2001	5:30 PM	Tstm Wind	65 kts.	0	0	0	0
232 Orrum	8/18/2001	1:40 PM	Tstm Wind	60 kts.	0	0	0	0
233 Pembroke	8/18/2001	1:40 PM	Tstm Wind	55 kts.	0	0	0	0
240 Maxton	3/16/2002	3:53 PM	Tstm Wind	90 kts.	0	1	750K	0
241 Lumber Bridge	3/31/2002	1:35 PM	Tstm Wind	52 kts.	0	0	0	0
246 Pembroke	5/10/2002	4:25 PM	Tstm Wind	60 kts.	0	0	0	0
247 Pembroke	5/13/2002	7:58 PM	Tstm Wind	60 kts.	0	0	0	0
248 Lumberton	5/13/2002	8:07 PM	Tstm Wind	60 kts.	0	0	0	0
250 Fairmont	6/14/2002	6:30 PM	Tstm Wind	70 kts.	0	0	100K	0
252 Pembroke	8/24/2002	6:30 PM	Tstm Wind	65 kts.	0	0	0	0
256 Barnesville	2/22/2003	2:30 PM	Tstm Wind	60 kts.	0	0	0	0
258 Maxton	5/2/2003	6:20 PM	Tstm Wind	60 kts.	0	0	0	0
259 Pembroke	5/2/2003	6:35 PM	Tstm Wind	70 kts.	0	0	30K	0
260 Lumberton	5/2/2003	6:38 PM	Tstm Wind	60 kts.	0	0	0	0
270 Maxton	5/25/2003	9:30 PM	Tstm Wind	70 kts.	0	0	60K	0
271 Pembroke	5/31/2003	2:52 PM	Tstm Wind	70 kts.	0	0	25K	0
272 Lumberton	5/31/2003	3:00 PM	Tstm Wind	70 kts.	0	0	15K	0
274 Lumberton	5/31/2003	5:25 PM	Tstm Wind	70 kts.	0	0	250K	0
276 St Pauls	7/9/2003	8:41 PM	Tstm Wind	65 kts.	0	0	0	0
277 Orrum	7/11/2003	7:45 PM	Tstm Wind	60 kts.	0	0	0	0
278 Lumberton	7/13/2003	4:40 PM	Tstm Wind	65 kts.	0	0	0	0
287 Lumberton	5/23/2004	3:53 PM	Tstm Wind	55 kts.	0	0	0	0
289 Fairmont	5/23/2004	4:49 PM	Tstm Wind	55 kts.	0	0	0	0
290 Maxton	8/12/2004	1:29 PM	Tstm Wind	60 kts.	0	0	20K	0
299 Red Spgs	3/8/2005	9:30 AM	Tstm Wind	52 kts.	0	0	0	0
300 Orrum	3/8/2005	9:36 AM	Tstm Wind	55 kts.	0	0	0	0
301 Lumberton	3/8/2005	9:40 AM	Tstm Wind	65 kts.	0	0	40K	0
304 Lumberton	4/17/2006	3:27 PM	Tstm Wind	60 kts.	0	0	0	0
312 Lumberton	6/8/2006	5:09 PM	Tstm Wind	60 kts.	0	0	0	0
313 Pembroke	6/11/2006	5:15 PM	Tstm Wind	65 kts.	0	0	15K	0
315 Pembroke	6/21/2006	3:50 PM	Tstm Wind	55 kts.	0	0	0	0
316 Maxton	7/15/2006	4:51 PM	Tstm Wind	55 kts.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
317 Lumberton	7/15/2006	5:00 PM	Tstm Wind	65 kts.	0	0	0	0
318 Orrum	7/15/2006	5:35 PM	Tstm Wind	65 kts.	0	0	0	0
142 Maxton	6/15/1996	4:11 PM	Tstm Wind/hail	75 kts.	0	0	0	0
330 NCZ087	11/5/2007	15:00 PM	Wildfire	N/A	0	0	0K	0K
331 NCZ087	12/1/2007	12:00 AM	Wildfire	N/A	0	0	0K	0K
108 Statewide	3/12/1993	1600	Winter Storm	N/A	2	10	50.0M	0
194 NCZ087 - 096>097 - 099>101	1/25/2000	2:30 AM	Winter Storm	N/A	0	0	0	0
217 NCZ087	12/3/2000	8:00 AM	Winter Storm	N/A	0	0	20K	0
239 NCZ087 - 096>097 - 099>101	1/2/2002	3:00 PM	Winter Storm	N/A	0	0	0	0
254 NCZ087 - 096>097 - 099>101	1/23/2003	5:00 AM	Winter Storm	N/A	0	0	150K	0
283 NCZ087 - 096	2/26/2004	5:00 AM	Winter Storm	N/A	0	0	0	0
282 NCZ087 - 096 - 099	2/17/2004	5:00 AM	Winter Weather/mix	N/A	0	0	0	0
298 NCZ087 - 096 - 099	12/26/2004	5:00 AM	Winter Weather/mix	N/A	0	0	30K	0

APPENDIX C. ADOPTION RESOLUTION

ROBESON COUNTY
NORTH CAROLINA

Amanda Revels ~~Manager - Editor -~~ Associate Editor, of THE ROBESONIAN, a newspaper published in Robeson County, N.C. being duly sworn, says that at the time the attached notice was published in THE ROBESONIAN, said newspaper met all of the requirements and qualifications prescribed by North Carolina General Statute 1-597; that said newspaper had a general circulation to actual paid subscribers; and, was admitted to the United States mail as second class matter in Robeson County, N.C.; and further, that the attached notice was published in THE ROBESONIAN once a week for 2 consecutive weeks on the following issue dates

September 24th, October 1st, 2010

Manager-Editor-Associate Editor

Sworn to and subscribed before me

this the 1 day of October 2010

NOTARY PUBLIC

My commission expires: 7-23-2011

CLARISSA JACKSON NOTARY PUBLIC ROBESON COUNTY, N.C.

Notices

TOWN OF PEMBROKE NOTICE OF PUBLIC HEARING ON THE 2010 HAZARD MITIGATION PLAN UPDATE

Notice is hereby given that the Town of Pembroke Town Council will conduct a public hearing on October 4, 2010, at 7:00 p.m., in the Pembroke Town Hall, 100 Union Chapel Road, Pembroke, NC, to discuss the 2010 Hazard Mitigation Plan Update. Following the public hearing, the Council will consider adoption of the plan. All citizens are encouraged to attend.

A copy of the plan is available for public review at the Pembroke Town Hall, 100 Union Chapel Road, Pembroke, NC. The public is encouraged to review the draft plan.

For questions and/or additional information, please contact the Town Manager at 910/521-9758.

TOWN OF PEMBROKE

RESOLUTION ADOPTING THE
PEMBROKE HAZARD MITIGATION PLAN UPDATE

WHEREAS, the citizens and property within the Town of Pembroke are subject to the effects of natural hazards and man-made hazard events that pose threats to lives and cause damages to property, and with the knowledge and experience that certain areas, i.e., flood hazard areas, are particularly susceptible to flood hazard events; and

WHEREAS, the Town of Pembroke desires to seek ways to mitigate situations that may aggravate such circumstances; and

WHEREAS, the Legislature of the State of North Carolina, in Part 6, Article 21 of Chapter 143; Parts 3, 5, and 8 of Article 19 of Chapter 160A; and Article 8 of Chapter 160A of the North Carolina General Statutes, has delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina, in Section 1 Part 166A of the North Carolina General Statutes (adopted in Session Law 2001-214 – Senate Bill 300 effective July 1, 2001), has stated in Item (a) (2): "For a state of disaster proclaimed pursuant to G.S. 166A-6(a) after August 1, 2002, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act that is updated every five years"; and

WHEREAS, it is the intent of the Town Council of the Town of Pembroke to fulfill this obligation in order that the town will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the town; and

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan and update it every five years in order to receive future Hazard Mitigation Grant Program Funds; and

NOW, THEREFORE, be it resolved that the Town Council of the Town of Pembroke hereby:

1. Adopts the Town of Pembroke Hazard Mitigation Plan; and

2. Vests the Town Manager with the responsibility, authority, and the means to:

    (a) Inform all concerned parties of this action.
    (b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map, and identify floodplain or flood-related erosion areas, and cooperate with neighboring communities with respect to management of adjoining floodplain and/or flood-related erosion areas in order to prevent aggravation of existing hazards.

3. Appoints the Town Manager to assure that the Hazard Mitigation Plan is reviewed annually and in greater detail at least once every five years.

4. Agrees to take such other official action as may be reasonably necessary to carry out the strategies outlined within the 2010 Town of Pembroke Hazard Mitigation Plan.

Adopted this 4th day of October, 2010.

Milton R. Hunt, Mayor
Town of Pembroke

ATTEST:

Amira Locklear Hunt, Town Clerk (SEAL)

THE COMMISSIONERS OF THE TOWN OF PEMBROKE
TOWN OF PEMBROKE
SEAL
NORTH CAROLINA

APPENDIX D. NCEM REVIEW COMMENTS

INSTRUCTIONS FOR USING THE PLAN REVIEW CROSSWALK FOR REVIEW OF LOCAL MITIGATION PLANS

Attached is a Plan Review Crosswalk based on the ***Local Multi-Hazard Mitigation Planning Guidance***, published by FEMA in July, 2008. This Plan Review Crosswalk is consistent with the *Robert T. Stafford Disaster Relief and Emergency Assistance Act* (Stafford Act), as amended by Section 322 of the *Disaster Mitigation Act of 2000* (P.L. 106-390), the *National Flood Insurance Act of 1968,* as amended by the *National Flood Insurance Reform Act of 2004* (P.L. 108-264) and *44 Code of Federal Regulations (CFR) Part 201 – Mitigation Planning,* inclusive of all amendments through October 31, 2007.

SCORING SYSTEM
N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.
S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Each requirement includes separate elements. All elements of a requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a summary score of "Satisfactory." A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing.

When reviewing single jurisdiction plans, reviewers may want to put an N/A in the boxes for multi-jurisdictional plan requirements. When reviewing multi-jurisdictional plans, however, all elements apply. States that have additional requirements can add them in the appropriate sections of the *Local Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements. Optional matrices for assisting in the review of sections on profiling hazards, assessing vulnerability, and identifying and analyzing mitigation actions are found at the end of the Plan Review Crosswalk.

The example below illustrates how to fill in the Plan Review Crosswalk.:

Assessing Vulnerability: Overview

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.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan include an **overall summary** description of the jurisdiction's **vulnerability** to each hazard?	Section II, pp. 4-10	The plan describes the types of assets that are located within geographically defined hazard areas as well as those that would be affected by winter storms.		□
B. Does the **new or updated** plan address the **impact** of each hazard on the jurisdiction?	Section II, pp. 10-20	The plan does not address the impact of two of the five hazards addressed in the plan. **Required Revisions:** • Include a description of the impact of floods and earthquakes on the assets. **Recommended Revisions:** This information can be presented in terms of dollar value or percentages of damage.	□	
		SUMMARY SCORE	□	

LOCAL MITIGATION PLAN REVIEW SUMMARY

The plan cannot be approved if the plan has not been formally adopted. Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk. A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing. Reviewer's comments must be provided for requirements receiving a **"Needs Improvement"** score.

Prerequisite(s) (Check Applicable Box)	**NOT MET**	**MET**
1. Adoption by the Local Governing Body: §201.6(c)(5) OR		X
2. Multi-Jurisdictional Plan Adoption: §201.6(c)(5) **AND**		N/A
3. Multi-Jurisdictional Planning Participation: §201.6(a)(3)		N/A

Planning Process	**N**	**S**
4. Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)		X

Risk Assessment	**N**	**S**
5. Identifying Hazards: §201.6(c)(2)(i)		X
6. Profiling Hazards: §201.6(c)(2)(i)		X
7. Assessing Vulnerability: Overview: §201.6(c)(2)(ii)		X
8. Assessing Vulnerability: Addressing Repetitive Loss Properties. §201.6(c)(2)(ii)		X
9. Assessing Vulnerability: Identifying Structures, Infrastructure, and Critical Facilities: §201.6(c)(2)(ii)(B)		X
10. Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)		X
11. Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)		X
12. Multi-Jurisdictional Risk Assessment: §201.6(c)(2)(iii)		N/A

*States that have additional requirements can add them in the appropriate sections of the *Local Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements.

SCORING SYSTEM

Please check one of the following for each requirement.

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Mitigation Strategy	**N**	**S**
13. Local Hazard Mitigation Goals: §201.6(c)(3)(i)		X
14. Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii)		X
15. Identification and Analysis of Mitigation Actions: NFIP Compliance. §201.6(c)(3)(ii)		X
16. Implementation of Mitigation Actions: §201.6(c)(3)(iii)		X
17. Multi-Jurisdictional Mitigation Actions: §201.6(c)(3)(iv)		N/A

Plan Maintenance Process	**N**	**S**
18. Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(ii)		X
19. Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)		X
20. Continued Public Involvement: §201.6(c)(4)(iii)		X

Additional State Requirements*	**N**	**S**
Insert State Requirement		
Insert State Requirement		
Insert State Requirement		

LOCAL MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED	
See Reviewer's Comments	
PLAN APPROVED	X

Local Mitigation Plan Review and Approval Status

Jurisdiction: Town of Pembroke	**Title of Plan:** The Town of Pembroke: Hazard Mitigation Plan Update	**Date of Plan:**
Local Point of Contact: McDuffie Cummings	**Address:**	
Title: Town Manager	Town of Pembroke 100 Union Chapel Road P.O. Box 866 Pembroke, NC 28372	
Agency: Town of Pembroke		
Phone Number: 910-521-9758	**E-Mail: mcduffie@pembrokenc.com**	

State Reviewer: Callion Maddox	**Title:** Hazard Mitigation Specialist	**Date:** 6/4/2010

FEMA Reviewer: **Brenda Stirrup**	**Title:** **Planning Specialist**	**Date:** **8-10-10, 11-4-10 (AR)**
Date Received in FEMA Region IV	**7-8-10**	
Plan Not Approved	**8-24-10**	
Plan Approved	**11-4-10**	
Date Approved	**11-4-10**	

Jurisdiction:	**DFIRM**		**NFIP Status***			
	In Plan	**NOT in Plan**	**Y**	**N**	**N/A**	**CRS Class**
1. Town of Pembroke		**X**	**X**			
2.						
3.						
4.						
5. [ATTACH PAGE(S) WITH ADDITIONAL JURISDICTIONS]						

*** Notes:** **Y = Participating** **N = Not Participating** **N/A = Not Mapped**

PREREQUISITE(S)

1. Adoption by the Local Governing Body

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

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Has the local governing body adopted **new or updated** plan?	Appendix C	**In accordance with established State Mitigation Procedure, this Plan Update has not been formally adopted. According to State Procedure, formal adoption is to take place once the State and Federal Reviews are completed.** **REQUIRED:** The Updated Plan must be adopted within one calendar year of FEMA's "approval pending adoption" of the Updated Plan. **REVISION RECEIVED:** Adoption resolution received for the Town of Pembroke 11-4-10. For more information, see "Adoption By The Local Governing Body", in the Local Multi-Hazard Mitigation Planning Guidance, Pages 17-18.		X
B. Is supporting documentation, such as a resolution, included?	Appendix C	**According to State Procedure, a Resolution is to be included once the State and Federal Reviews are completed.** **REQUIRED REVISION:** The Updated Plan shall include a copy of the resolution or other documentation of formal adoption of the Updated Plan within one calendar year. **REVISION RECEIVED:** Adoption resolution received for the Town of Pembroke 11-4-10. For more information, see "Adoption By The Local Governing Body", in the Local Multi-Hazard Mitigation Planning Guidance, Pages 17-18.		X
		SUMMARY SCORE		X

2. Multi-Jurisdictional Plan Adoption

***Requirement §201.6(c)(5)*:** *For multi-jurisdictional plans, each jurisdiction requesting approval of the plan **must** document that it has been formally adopted.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the **new or updated** plan indicate the specific jurisdictions represented in the plan?	*N/A*	This is a single Jurisdiction plan Update		N/A
B. For each jurisdiction, has the local governing body adopted the **new or updated** plan?	*N/A*	This is a single Jurisdiction plan Update		N/A
C. Is supporting documentation, such as a resolution, included for each participating jurisdiction?	N/A	This is a single Jurisdiction plan Update		N/A
		SUMMARY SCORE		N/A

3. Multi-Jurisdictional Planning Participation

***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.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the **new or updated** plan describe **how** each jurisdiction participated in the plan's development?	N/A	This is a single Jurisdiction plan Update		N/A
B. Does the updated plan identify all participating jurisdictions, including new, continuing, and the jurisdictions that no longer participate in the plan?	N/A	This is a single Jurisdiction plan Update		N/A
		SUMMARY SCORE		N/A

PLANNING PROCESS: *§201.6(b): An open public involvement process is essential to the development of an effective plan.*

4. Documentation of the Planning Process

Requirement §201.6(b): *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.

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.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan provide a narrative description of the process followed to prepare the **new or updated** plan?	Section 1.C.1 – Pages 13 to 16	**Yes, the plan provides a narrative description of the process followed to prepare the update.** **There was some minor restructuring of this narrative from the existing document; however, the requirement to describe the process that jurisdiction went through to update the plan has been clearly stated.** FEMA reviewer concurs with State reviewer's comments.		**X**
B. Does the **new or updated** plan indicate who was involved in the **current** planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, *etc*.?)	Section 1.C.1 – Pages 13 to 16	**Yes, the plan update indicates who was involved in the current planning update process.** **A full disclosure of all parties involved in the update process has been outlined within the description of the planning process.** The Updated Plan indicates all of the people and organizations that were involved in the current planning process. Primary responsibility for development of the Plan Update was placed in the hands of the Pembroke Administration, under the direction of the Deputy Town Manager. Representatives from Town management and administration, planning/zoning, public works, fire/police, and other offices also participated. The Mitigation Advisory Committee (MAC) was charged with overseeing the update.		**X**

4. Documentation of the Planning Process

Requirement §201.6(b): *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.

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.*

	Location in the		SCORE	
C. Does the **new or updated** plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)	Section 1.C.1 – Pages 13 to 16	**Yes, the plan update indicates how the public was involved through public meetings described on page 17.** **Pages 13 to 17 outlines the meetings that were held through the course of the plan update process. Within this narrative it is noted where meetings were advertised to solicit public input. Specifically, the January Public Information Meeting and January MAC meeting were advertised. Affidavits of publication will also be provided for the two advertised meetings.** FEMA reviewer concurs with State reviewer's comprehensive comments.		**X**
D. **Does the new or updated plan discuss the** opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?	Section 1.C.1 – Page 15 Section 1.C.1 – Page 15	**Yes, the plan update discuss the opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning update process.** The Updated Plan states that the draft plan was completed on January 19, 2010, and distributed to MAC members and representatives of the following stakeholder offices/organizations for review and comment: • Robeson County Emergency Management Department • North Carolina Department of Transportation • American Red Cross • Robeson County Administrative Office		**X**
E. Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?	Section 1.6.3 – Page 18 Section 1.6.3 – Page 18	**Yes, the planning process describes the review and incorporation of existing plans, studies, reports, and technical information.** As indicated in the Plan, the Town of Pembroke incorporated the following plans and ordinances: • Land Use Plan • Zoning Ordinance		**X**

4. Documentation of the Planning Process

Requirement §201.6(b): *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.

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.*

	Location in the		SCORE	
		The Plan further states that through implementation of this plan, the Town will continue to reference these documents in an effort to carry out an effective mitigation program within the Town of Pembroke.		
F. Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process?	Section 1.C.2 Pages 16 to 19 Section 1.C.2 Pages 16 to 19	**Yes, the plan update document how the planning team reviewed and analyzed each section of the plan.** The Updated Plan documents how the planning team reviewed and analyzed each of the six sections of the plan, and whether each section was revised as part of the update process. This information is provided in narrative form in the Plan Format section of the Plan.		**X**
		SUMMARY SCORE		**X**

RISK ASSESSMENT: *§201.6(c)(2): 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.*

5. Identifying Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the type … of all natural hazards that can affect the jurisdiction.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan include **a description** of the types of **all natural hazards** that affect the jurisdiction?	Section 2.B – Pages 20 to 50 Section 2.B – Pages 20 to 50	**Yes, the plan update includes a description of the types of all natural hazards that affect the jurisdiction. The following outlines how the hazards have been addressed within the plan update. If a hazard was removed from the 2004 plan, justification is provided on Page 50. The descriptions of several of the hazards have been updated within this section, including discussions of hazards that have impacted the Town over the last five years. All new language is indicated in highlighting, while anything removed is indicated in strikethrough. The decision to remove certain hazards from the updated plan was based on discussion held with the MAC during the planning process.** FEMA reviewer concurs with State reviewer's comprehensive comments. I n addition, a description of the following hazards was described in the Plan Update: Hurricanes, Flooding, Nor'easters, Tornadoes and Thunderstorms, Severe Winter Storms, and Dam/Levee Failures. While they were initially profiled, it was later determined that the town did not need to concentrate efforts on the mitigation of Earthquakes, Sinkholes, Droughts or Wildfires. Therefore, they were not further profiled in the Plan Update. **RECOMMENDED REVISION:** Do not use highlighting or strikethroughs to indicate changes in future Plan Updates.		X
		SUMMARY SCORE		X

6. Profiling Hazards

Requirement §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.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the risk assessment identify the **location** (*i.e.*, geographic area affected) of each natural hazard addressed in the **new or updated** plan?	Page 56 (Map 4) All Hazards Page 68 (Map 9) Flood Hazard Areas (Map 10) All Hazards Page 70 Pp 67-70	**Yes, the risk assessment identifies the location of each natural hazard addressed in the new or updated plan?** **Page 56 (Map 4) – Provides a map that details land use and provides the area impacted by hazards which impact the entire jurisdiction as outlined on Page 83.** **The FIRM data outlined on Page 68 (Map 9) is based on updated maps put into effect over the last five years.** The locations of the following geographically defined hazards are addressed in the Updated Plan in narrative or map formats: flooding and dam/levee failures. The entire town is exposed to the other four hazards that are addressed in the Plan. The Plan further states that if any of the dams fail, the area affected will likely be located in the general area of the flood hazard area.		**X**
B. Does the risk assessment identify the **extent** (*i.e.*, magnitude or severity) of each hazard addressed in the **new or updated** plan?	Worksheet #1 Page: Pages 51 to 52 Pp. 20-53	**Yes, the updated risk assessment identifies the extent of each hazard addressed in the plan.** **Two hazards (landslides and tsunamis) were removed from this chart, because it was determined that they have no likelihood of occurrence within the Town of Pembroke. The MAC's justification for removing these hazards has been provided on Page 60 of the plan.** The risk assessment identifies the magnitude or severity of each hazard addressed in the Updated Plan. A discussion of what the jurisdictions could anticipate was supported by technical measures such as diameter and miles per hour.		**X**

C. Does the plan provide information on **previous occurrences** of each hazard addressed in the **new or updated** plan?	Section 2.B – Pp 20 to 53	**Yes, the plan update provides information on previous occurrences of each hazard addressed in the plan.** **The following outlines how the hazards have been addressed within the plan update. If a hazard was removed from the 2004 plan, justification is provided on Page 60. The descriptions of several of the hazards have been updated within this section, including discussions of hazards that have impacted the Town over the last five years. All new language is indicated in highlighting, while anything removed is indicated in strikethrough.** **The decision to remove certain hazards from the updated plan, were based on discussion held with the MAC during the planning process. Yes the plan update provide information on previous occurrences of each hazard addressed in the plan.** Much of the comments above do not address this element. Data is provided in the Plan Update on the previous occurrences of the hazards that are addressed in the Plan when data was available, or when there was a previous occurrence. For example, while nor'easters were profiled in the Plan, and determined to possibly occur in the Town, there was no record of any significant nor'easters impacting the Town.		**X**
D. Does the plan include the **probability of future events** (*i.e.*, chance of occurrence) for each hazard addressed in the **new or updated** plan?	Worksheet #1 Page: Pages 51 to 52 Pp 20 to 53	**Yes the plan update includes the probability of future events for each hazard addressed in the plan..** **The only change in Worksheet #1 was that landslides and tsunamis were removed based on their unlikely impact on the Town of Pembroke.** The Plan includes the chance of occurrence for each hazard that is addressed in sections of the Plan entitled Likelihood of Occurrence.		**X**
		SUMMARY SCORE		**X**

7. Assessing Vulnerability: Overview

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.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan include an **overall summary** description of the jurisdiction's **vulnerability** to each hazard?	Section 3 Worksheet #2A Pages 73 to 74 Non Specific Hazards Worksheet #2B Page 75 Pp 20-53; 72-78	**Yes, the plan update includes an overall summary description of the jurisdiction's vulnerability to each hazard.** The Updated Plan includes a summary description of the Town's vulnerability to each of the hazards.		**X**
B. Does the **new or updated** plan address the **impact** of each hazard on the jurisdiction?	Section 3.F pgs 67 to 78 & Section 3 Worksheet #2A pgs 73 to 74 Non Specific Hazards Worksheet #2B pg 75 Pp 20-53; 72-78	**Yes, the plan update addresses the impact of each hazard on the jurisdiction.** The Updated Plan addresses the impact of each hazard on the jurisdiction. Data is presented in the table format as well as sections of the risk assessment.		**X**
		SUMMARY SCORE		**X**

8. Assessing Vulnerability: Addressing Repetitive Loss Properties

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

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe vulnerability in terms of the types and numbers of *repetitive loss properties* located in the identified hazard areas?	**Section 3.F.4 Page 69**	**There are no repetitive loss properties in Pembroke, and it is not anticipated that there will be any based on the findings of this document.**		
	Section 3.F.4 Page 69	There are no repetitive loss structures within the Town of Pembroke.		**X**
		SUMMARY SCORE		**X**

9. Assessing Vulnerability: Identifying Structures

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 … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe vulnerability in terms of the **types and numbers** of **existing** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Section 3 Worksheet #2A pgs 73 to 74 Non Specific Hazards Worksheet #2B, pg 75	***Yes,* the plan update describes vulnerability in terms of the types and numbers of *existing* buildings, infrastructure and critical facilities located in the identified hazard areas.**		
	Pp 72-78	FEMA reviewer concurs with State reviewer's comments.		X
B. Does the **new or updated** plan describe vulnerability in terms of the **types and numbers** of **future** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Section 3 Worksheet #2A pgs 73 to 74 Non Specific Hazards Worksheet #2B, pg 75	**Yes, the plan update describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas** **Please see the Chart on page 75 specifically hr section titled:** **POTENTIAL FUTURE CONDITIONS**		
	Pp 72-78	The Updated Plan describes vulnerability in terms of the types and numbers of future residences and businesses. The Updated Plan states that no data is provided for critical facilities for flood and dam/level failure. The information is referred to as potential future conditions.		**X**
		SUMMARY SCORE		**X**

10. Assessing Vulnerability: Estimating Potential Losses

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 … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan estimate **potential dollar losses** to vulnerable structures?	Section 3 Worksheet #2A Pages 73 to 74 Non Specific Hazards Worksheet #2B Page 75 Pp. 72-78	***Yes,* the plan update estimate potential dollar losses to vulnerable structures** **Please see the Chart on page 75 specifically hr section titled:** **POTENTIAL FUTURE CONDITIONS** The Updated Plan estimates potential dollar losses to vulnerable structures. The data is based on current replacement values.		X
B. Does the **new or updated** plan describe the **methodology** used to prepare the estimate?	Section 3 Page 77 to 78 Pp 77-78	**Yes, the plan update describes the methodology used to prepare the estimate. The methodology has been updated to reflect the plan update. Additional GIS data was available that was not incorporated into the 2004 plan.** The Updated Plan describes that the methodology that was used to prepare the estimate. Replacement values were derived from the 2009 tax value as reported by the Robeson County Tax Office.		X
		SUMMARY SCORE		X

11. Assessing Vulnerability: Analyzing Development Trends

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.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe land uses and development trends?	Section 3.B & C Pages 53 to 61 Section 3.B & C Pages 53 to 61; 86-88	**Yes the plan update describes land uses and development trends.** The town has recently gone through the process of developing a unified development ordinance. As a result, approximately seventy-six percent of parcels have been assigned as a residential zoning district and six percent have been assigned a commercial zoning district. Recent development has been occurring in the commercial zoning district. A map is included in the Plan which depicts the anticipated areas of growth for the Town.		X
		SUMMARY SCORE		X

12. Multi-Jurisdictional Risk Assessment

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.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?	N/A	**This is a single jurisdiction Plan Update.**		**N/A**
		SUMMARY SCORE		**N/A**

MITIGATION STRATEGY: *§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.*

13. Local Hazard Mitigation Goals

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.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the **new or updated** plan include a description of mitigation **goals** to reduce or avoid long-term vulnerabilities to the identified hazards?	Section 5.A to B Page 104 to 109 P 99	**Yes, the plan update includes a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.** The Updated Plan includes a description of six mitigation goals accompanied by ten objectives to reduce or avoid long-term vulnerabilities to the identified hazards.		X
		SUMMARY SCORE		X

14. Identification and Analysis of Mitigation Actions

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.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?	Section 5.A to B Page 104 to 109 Section 5.A to B Page 104 to 109	The strategies remaining within the plan have been reviewed for their current applicability. If a strategy has been removed, it was accomplished over the last five years and is indicated through strikeout. **Yes, the plan update identifies and analyzes a comprehensive range of specific mitigation actions and projects for each hazard.** The Updated Plan includes mitigation actions for each hazard. Many of the actions address specific hazards, while other actions are broad ranging and address all hazards.		X
B Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?	Section 5.A to B Page 104 to 109	(Updated Plan) Mitigation Strategies: 1, 4, 5, 6 **Yes, the identified actions and projects does not address reducing the effects of hazards on new buildings and infrastructure**		X

	Section 5.A to B Page 104 to 109	The identified actions and projects address reducing the effects of hazards on new buildings and infrastructure. Examples include the following: • Enforce the Town's zoning regulations and implement the Pembroke Land Use Plan in portions of the Town that are undeveloped and susceptible to the effects of natural hazards. • Enforcement of the Town of Pembroke Floodplain Development Ordinance.		
C. Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?	Section 5.A to B Page 104 to 109 Section 5.A to B Page 104 to 109	(Updated Plan) Mitigation Strategies: 1, 3, 4, 5, 6, 7 **Yes, the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure.** The identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure. One example is to adopt a Comprehensive Stormwater Management Program.		**X**
		SUMMARY SCORE		**X**

15. Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance

Requirement: §201.6(c)(3)(ii): *[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.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe the jurisdiction (s) participation in the NFIP?	Section 4.B.1 Pages 82 to 84 Section 4.B.1 Page 82	**The town's participation in the NFIP is acknowledged in conjunction with the requirement that it maintains and enforce a Flood Damage Prevention Ordinance. Please state how the towns Flood Damage Prevention Ordinance relates to the guidelines set forth by the NFIP program(i.e. what regulations)** The Updated Plan states the Town of Pembroke joined the National Flood Insurance Program (NFIP) in 2007. The Town remains an active NFIP participant.		**X**
B. Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?	Section 5.D.2 Page 100 to 103 **Pages 94 to 96**	**Yes, the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP.**		**X**

		The mitigation strategy identifies, analyzes and prioritizes actions related to continued compliance with the NFIP. Such actions include the following: • Enforcement of the Town of Pembroke Floodplain Development Ordinance. • Enforcement of Town's zoning regulations and implementing the Town's Land Use Plan in portions of the Town that are undeveloped and susceptible to the effects of flooding. • Encourage builders, developers, and architects to become familiar with the NFIP land use and building standards by attending annual workshops presented by the NC Division of Emergency Management.		
			SUMMARY SCORE	**X**

16. Implementation of Mitigation Actions

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.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** mitigation strategy include how the actions are prioritized? (For example, is there a discussion of the process and criteria used?)	Section 5.D.2 Page 102 Section 5.D.2 Page 102	The same methodology was utilized for all strategies. **Yes, the updated mitigation strategy includes how the actions are prioritized.** **Also, please include a narrative on how this prioritization was derived.** The updated mitigation strategy includes a discussion of how the actions are prioritized, including the process and criteria that were used. Each mitigation action was determined to be of low, medium, or high priority based on evaluations during the planning process.		**X**
B. Does the **new or updated** mitigation strategy address how the actions will be implemented and administered, including the responsible department, existing and potential resources and the timeframe to complete each action?	**Section 5.A to B** **Page 104 to 109**	**Yes, the updated mitigation strategy addresses how the actions will be implemented and administered including the responsible department, existing and potential resources, and timeframe to complete each action.** **This is listed under each specific mitigation strategy.**		

	Section 5.A to B Page 104 to 109	The updated mitigation strategy includes the following information regarding how the actions will be implemented and administered: • Possible funding sources, if any • The agency or staff member assigned with responsibility for the policy • Projected completion dates		**X**
C. Does the **new or updated** prioritization process include an emphasis on the use of a **cost-benefit review** to maximize benefits?	Section 5.D.2 Page 101 Section 5.D.2 Page 101-102	***Yes*, the updated prioritization process includes an emphasis on the use of a cost-benefit review to maximize benefits.** Cost-benefit review was given special emphasis in the prioritization process. Each mitigation policy was assigned a priority based on a cost-benefit review conducted through the planning process. Included in the Plan are the factors that were utilized to conduct the cost-benefit review		**X**
D. Does the **updated** plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (*i.e.*, deferred), does the updated plan describe why no changes occurred?	Section 5.A.3 Pages 96 to 97 Pp 95-97; 104-109	**No, the plan update does identify all of the completed, deleted or deferred actions as a benchmark for progress. Please include completed strategies. This can utilized as bench mark for accomplished task.** The Updated Plan identifies the completed, deferred and ongoing mitigation actions as a benchmark for progress. Rationale was provided for the status of the actions from the 2004 Plan.		**X**
		SUMMARY SCORE		**X**

17. Multi-Jurisdictional Mitigation Actions

Requirement §201.6(c)(3)(iv): *For multi-jurisdictional plans, there **must** be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the **new or updated** plan include identifiable **action items** for each jurisdiction requesting FEMA approval of the plan?	N/A	**This is a single Jurisdictional Plan**		**N/A**
B. Does the **updated** plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (*i.e.*, deferred), does the updated plan describe why no changes occurred?	N/A	**This is a single Jurisdictional Plan**		**N/A**
		SUMMARY SCORE		**N/A**

PLAN MAINTENANCE PROCESS

18. Monitoring, Evaluating, and Updating the Plan

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.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe the method and schedule for **monitoring** the plan, including the responsible department?	Section 6.C Pages 112 to 113 Section 6.C Pages 112 to 113	**Yes, the plan update describe the method and schedule for monitoring the updated plan, including the MAC which is the responsible update Committee.** The Plan Update indicates that it will be reviewed bi-annually as well as after a hazard event. The Plan further states that monitoring the plan is part of maintaining the plan in an effort to gauge progress, roadblocks, or changing circumstances.		X
B. Does the **new or updated** plan describe the method and schedule for **evaluating** the plan, including how, when and by whom (*i.e.* the responsible department)?	Section 6.C Pages 112 to 113 Section 6.C Pages 112 to 113	. **Yes, the plan update describe the method and schedule for evaluating the updated plan, including the MAC which is the responsible update Committee.** In order to evaluate the Plan, the bi-annual review will involve a MAC meeting called by the Town Manager to review and discuss the policy initiatives outlined in the plan. The Town of Pembroke Administration is responsible for initiating this review and will consult with members of the MAC.		X
C. Does the **new or updated** plan describe the method and schedule for **updating** the plan within the five-year cycle?	Section 6.C Pages 112 to 113 Section 6.C Pages 112 to 113	**Yes, the plan update describe the method and schedule for updating the updated plan, including the MAC which is the responsible update Committee.** The Plan indicates that a five-year written update will be submitted to the NCEM and FEMA Region IV, unless disasters or other circumstances (e.g., changing regulations) require a change to this schedule.		X
		SUMMARY SCORE		X

19. Incorporation into Existing Planning Mechanisms

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.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan identify other local planning mechanisms available for incorporating the mitigation requirements of the mitigation plan?	**Section 6.E Page 114 Page 107** Section 6.E Page 114 Page 107	**Yes, the plan update identifies other local planning mechanisms available for incorporating the mitigation requirements of the mitigation plan.** FEMA reviewer concurs with State reviewer's comments.		X
B. Does the **new or updated** plan include a process by which the local government will incorporate the mitigation strategy and other information contained in the plan (*e.g.*, risk assessment) into other planning mechanisms, when appropriate?	Section 6.E Page 114 **Page 107** Section 6.E Page 114 Page 107	**Yes, the plan update identifies a process by which the local government will incorporate the mitigation strategy and other information contained in the plan.** The Updated Plan references using existing plans and/or programs to implement hazard mitigation in the Town, where possible. The Plan further states that based on the plan's capability assessment, the Town has and continues to implement policies and programs to reduce losses to life and property from natural hazards. This plan builds upon the momentum developed through previous and related planning efforts.		X
C. Does the **updated** plan explain how the local government ***incorporated*** the mitigation strategy and other information contained in the plan (*e.g.*, risk assessment) into other planning mechanisms, when appropriate?	**Section 6.E Page 114 Worksheet #3 Page 95** Section 6.E Page 114 Worksheet #3 Page 95	**Yes, the updated plan explain how the local government incorporated the mitigation strategy and other information contained in the plan (*e.g.*, risk assessment) into other planning mechanisms, when appropriate** **Worksheet #3 (page 95) provides an overview of how mitigation measures may be incorporated into existing Town-maintained planning and development documents. Pembroke Hazard** The Updated Plan references how the mitigation measures may be incorporated into planning mechanisms when appropriate.		X

		RECOMMENDED REVISION: At the next plan update include how the local government has ***already incorporated*** the mitigation strategy and other information in the plan into other planning mechanisms, when appropriate.		
		SUMMARY SCORE		**X**

20. Continued Public Involvement

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.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE** N	**SCORE** S
A. Does the **new or updated** plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)	Section 6.D Page 114	**Yes, the plan update explains how continued public participation will be obtained.** Based on this plan's capability assessment, the Town has and continues to implement policies and programs to reduce losses to life and property from natural hazards. This plan builds upon the momentum developed through previous and related planning efforts and recommends implementing projects.		
	Section 6.D Page 114	The Plan Update indicates that public participation will be obtained via hearings, which will be held once within the context of the defined bi-annual review process. In addition, when the MAC reconvenes for updates, they will coordinate with all stakeholders. The plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, and press releases to local media.		**X**
		SUMMARY SCORE		**X**

MATRIX A: PROFILING HAZARDS

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the jurisdiction. **Completing the matrix is not required**.

Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each** applicable **hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Location		B. Extent		C. Previous Occurrences		D. Probability of Future Events	
	Yes	N	S	N	S	N	S	N	S
Avalanche	☐	☐	☐	☐	☐	☐	☐	☐	☐
Coastal Erosion	☐	☐	☐	☐	☐	☐	☐	☐	☐
Coastal Storm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Dam Failure	☐	☐	☐	☐	☐	☐	☐	☐	☐
Drought	☐	☐	☐	☐	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐	☐	☐	☐	☐
Expansive Soils	☐	☐	☐	☐	☐	☐	☐	☐	☐
Levee Failure	☐	☐	☐	☐	☐	☐	☐	☐	☐
Flood	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hailstorm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hurricane	☐	☐	☐	☐	☐	☐	☐	☐	☐
Land Subsidence	☐	☐	☐	☐	☐	☐	☐	☐	☐
Landslide	☐	☐	☐	☐	☐	☐	☐	☐	☐
Severe Winter Storm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tornado	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tsunami	☐	☐	☐	☐	☐	☐	☐	☐	☐
Volcano	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wildfire	☐	☐	☐	☐	☐	☐	☐	☐	☐
Windstorm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐	☐	☐	☐

To check boxes, double click on the box and change the default value to "checked."

Legend:

§201.6(c)(2)(i) Profiling Hazards
A. Does the risk assessment identify the location (*i.e.*, geographic area affected) of each hazard addressed in the **new or updated** plan?
B. Does the risk assessment identify the extent (*i.e.*, magnitude or severity) of each hazard addressed in the **new or updated** plan?
C. Does the plan provide information on previous occurrences of each natural hazard addressed in the **new or updated** plan?
D. Does the plan include the probability of future events (*i.e.*, chance of occurrence) for each hazard addressed in the plan?

MATRIX B: ASSESSING VULNERABILITY

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure that the new or updated plan addresses each requirement. **Completing the matrix is not required**.

*Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each **applicable** hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk. Note: Receiving an N in the shaded columns will not preclude the plan from passing.*

To check boxes, double click on the box and change the default value to "checked."

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	§201.6(c)(2)(ii) Assessing Vulnerability: Overview	A. Overall Summary Description of Vulnerability		B. Hazard Impact		§201.6(c)(2)(ii) Assessing Vulnerability: Identifying Structures	A. Types and Number of Existing Structures in Hazard Area (Estimate)		B. Types and Number of Future Structures in Hazard Area (Estimate)		§201.6(c)(2)(ii) Assessing Vulnerability: Estimating Potential Losses	A. Loss Estimate		B. Methodology	
	Yes		N	S	N	S		N	S	N	S		N	S	N	S
Avalanche	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Coastal Erosion	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Coastal Storm	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Dam Failure	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Drought	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Earthquake	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Expansive Soils	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Levee Failure	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Flood	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Hailstorm	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Hurricane	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Land Subsidence	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Landslide	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Severe Winter Storm	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Tornado	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Tsunami	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Volcano	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Wildfire	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Windstorm	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Other _____	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Other _____	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Other _____	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐

Legend:

§201.6(c)(2)(ii) Assessing Vulnerability: Overview

A. Does the **new or updated** plan include an overall summary description of the jurisdiction's vulnerability to each hazard?

B. Does the **new or updated** plan address the impact of each hazard on the jurisdiction?

§201.6(c)(2)(ii)(A) Assessing Vulnerability: Identifying Structures

A. Does the **new or updated** plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?

B. Does the **new or updated** plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

§201.6(c)(2)(ii)(B) Assessing Vulnerability: Estimating Potential Losses

A. Does the **new or updated** plan estimate potential dollar losses to vulnerable structures?

B. Does the **new or updated** plan describe the methodology used to prepare the estimate?

MATRIX C: IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure consideration of a range of actions for each hazard. **Completing the matrix is not required.**

*Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each **applicable** hazard. An "N" for any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Comprehensive Range of Actions and Projects	
	Yes	N	S
Avalanche	☐	☐	☐
Coastal Erosion	☐	☐	☐
Coastal Storm	☐	☐	☐
Dam Failure	☐	☐	☐
Drought	☐	☐	☐
Earthquake	☐	☐	☐
Expansive Soils	☐	☐	☐
Levee Failure	☐	☐	☐
Flood	☐	☐	☐
Hailstorm	☐	☐	☐
Hurricane	☐	☐	☐
Land Subsidence	☐	☐	☐
Landslide	☐	☐	☐
Severe Winter Storm	☐	☐	☐
Tornado	☐	☐	☐
Tsunami	☐	☐	☐
Volcano	☐	☐	☐
Wildfire	☐	☐	☐
Windstorm	☐	☐	☐
Other _____	☐	☐	☐
Other _____	☐	☐	☐
Other _____	☐	☐	☐

To check boxes, double click on the box and change the default value to "checked."

Legend:
§201.6(c)(3)(ii) Identification and Analysis of Mitigation Actions
A. Does the **new or updated** plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?

APPENDIX E. FUNDING SOURCES

1. Hazard Mitigation Grant Program (HMGP)

The Federal Disaster Assistance Act (Stafford Act) provides funds authorized by the federal government and made available by FEMA for a cost-share program to states. The HMGP provides 75% of the funds while the states provide 25% of the funds for mitigation measures through the post-disaster planning process. The Division of Emergency Management administers the program in this state. The state share may be met with cash or in-kind services. The program is available only for areas affected by a Presidentially-declared disaster.
Contact: NCDEM, 919/715-8000, http://www.dem.dcc.state.nc.us

2. Adopt-a-Trail Program

Through the North Carolina Department of Environment and Natural Resources, this program provides grant funding for trail planning, construction, maintenance, and administration.
Contact: NCDENR, 919/846-9991, http://www.enr.state.nc.us

3. Assistance to Firefighters Grant Program

Through the Federal Emergency Management Agency, this program provides four grant categories to assist state, local, and tribal Fire Departments with funding necessary for training, equipment purchase, vehicle acquisition, public awareness, code enforcement, arson prevention, and the like.
Contact: FEMA, 866/274-0960, http://www.usfa.fema.gov/grants

4. Community Development Block Grant (CDBG) Disaster Recovery Initiative

The CDBG program provides grants to communities for post-disaster hazard mitigation and recovery following a presidential declaration of a Major Disaster of Emergency. Funds can be used for activities such as acquisition, rehabilitation, or reconstruction of damaged properties and facilities and redevelopment of disaster-affected areas. Funds may also be used for emergency response activities, such as debris clearance and demolition and extraordinary increases in the level of necessary public services. HUD provides funds for the CDBG program, and with the help of the Division of Community Assistance administers the program in North Carolina.

5. Clean Water Management Trust Fund

An agency of the North Carolina Department of Environment and Natural Resources (NCDENR), the Clean Water Management Trust Fund (CWMTF) provides grants for enhancement and restoration of degraded waters. In addition, funding is provided for development of buffers and greenways near rivers for environmental, educational, and recreational needs.
Contact: CWMTF, 252/830-3222, http://www.cwmtf.net

6. Community Facilities Loans

The US Department of Agriculture (USDA), Rural Housing Service (RHS) provides funding for construction of community facilities for public use.
Contact: USDA, RHS Williamston Area Office, 252/792-7603,
http://www.rurdev.usda.gov/rhs/index.html

7. Disaster Preparedness Improvement Grant (DPIG)

This grant provides federal matching funds for communities to develop hazard mitigation plans, expand existing plans, update disaster preparation plans, and to prepare the administrative plans required to qualify for Hazard Mitigation Grant Program grants. Funds for the DPIG are provided by FEMA and the Division of Emergency Management administers the program in North Carolina.
Contact: NCDEM, 919/715-8000, http://www.dem.dcc.state.nc.us

8. Flood Insurance

The Federal Emergency Management Agency, Federal Insurance Administration provides the opportunity to purchase flood insurance under the Emergency Program of the National Flood Insurance Program (NFIP).
Contact: NFIP, 888/CALL-FLOOD, ext. 445, http://www.fema.gov/nfip

9. Flood Mitigation Assistance Program (FMAP)

This program provides grants for cost-effective measures to reduce or eliminate the long-term risk of flood damage to the built environment and real property. The program's main goal is to reduce repetitive losses to the National Flood Insurance Program. The FMAP is available to eligible communities every year, not just after a Presidentially-declared disaster. Funds for the FMAP are provided by FEMA and the Division of Emergency Management administers the program in North Carolina.
Contact: NCDEM, 919/715-8000, http://www.dem.dcc.state.nc.us

10. North Carolina Wetlands Restoration Program

This program, through the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality, provides in-kind services for the restoration of wetlands and for increased effectiveness of wetland mitigation efforts.
Contact: NCDENR, Division of Water Quality, 919/733-5083,
http://h2o.ehnr.state.nc.us/wrp

11. Parks and Recreation Trust Fund (PARTF)

Through the North Carolina Department of Environment and Natural Resources, this program provides matching funds for local parks and recreation public facility development.
Contact: NCDENR, 919/715-2662, http://www.enr.state.nc.us/

12. Physical Disaster Loans

The Small Business Administration (SBA) offers loans to victims of declared physical disasters for uninsured losses. The loan limit on these funds may be increased by twenty percent to provide for mitigation measures.
Contact: SBA, 800/827-5722, http://www.sba.gov/

13. Property Improvement Loan Insurance

The US Department of Housing and Urban Development (HUD) insures lenders against loss on loans for alterations, repairs and improvements to existing structures and new construction of nonresidential structures.
Contact: HUD, 202/708-1112, http://www.hud.gov/

14. Public Assistance Program (PA)

The Public Assistance provides federal aid to communities to help save lives and property in the immediate aftermath of a disaster and to help rebuild damaged facilities. Grants cover eligible costs associated with the repair, replacement, and restoration of facilities owned by state and local governments and nonprofit organizations. The Public Assistance program is administered by FEMA.
Contact: FEMA, http://www.fema.gov/r-n-r/pa/index.htm

15. Resource Conservation and Development

The US Department of Agriculture, Natural Resources Conservation Service (NRCS) provides technical and limited financial assistance to communities for resource conservation projects including land conservation, water management, and environmental enhancement.
Contact: NRCS, http://www.nrcs.usda.gov

16. River Basin Surveys and Investigations

The US Department of Agriculture, Natural Resources Conservation Service provides technical assistance to local agencies for planning activities to solve problems related to the river basin, including wetland preservation.
Contact: NRCS, http://www.nrcs.usda.gov

17. Small Business Administration Disaster Assistance Program

This program provides loans to businesses affected by Presidentially-declared disasters. The program provides direct loans to businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and equipment, inventory and supplies. Businesses of any size are eligible. Nonprofit organizations are also eligible. The SBA administers the Disaster Assistance Program.

18. Snagging and Clearing for Flood Control

The Office of the Chief of Engineers, Department of the Army, Department of Defense provides this service in order to reduce flood control.
Contact: http://www.usace.army.mil

19. Soil and Water Conservation

The US Department of Agriculture, Natural Resources Conservation Service provides this in-kind service in order to provide for the conservation, development and productive use of the nation's soil, water, and related resources.
Contact: USDA, NRCS, http://www.nrcs.usda.gov

20. Urban Park and Recreation Recovery Program

This program of the Department of the Interior, National Park Service (NPS) provides grants for local governments for improvements in park system management and recreational opportunities.
Contact: NPS, 202/565-1200, http://www.cr.nps.gov/index.htm

21. Watershed Protection and Flood Prevention Loans

This US Department of Agriculture, Rural Utilities Services (RUS) program provides loans to local organizations for the local share of costs for watershed improvement. Funding includes support for drainage, flood prevention and sedimentation control.
Contact: RUS, http://www.rurdev.usda.gov/rus/index.html

22. Watershed Surveys and Planning

The US Department of Agriculture, Natural Resources Conservation Service provides technical and financial assistance for sharing costs of watershed protection measures, including flood prevention, sedimentation control and recreation.
Contact: NRCS, http://www.nrcs.usda.gov