BROOKE-HANCOCK-JEFFERSON METROPOLITAN PLANNING COMMISSION

Multi-Jurisdictional Hazard Mitigation Plan

BROOKE-HANCOCK-JEFFERSON METROPOLITAN PLANNING COMMISSION HAZARD MITIGATION PLAN

RELEASED 2012

FOR BROOKE AND HANCOCK COUNTIES AND THE MUNICIPALITIES THEREIN

BROOKE-HANCOCK-JEFFERSON METROPOLITAN PLANNING COMMISSION
HAZARD MITIGATION PLAN
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SECTION 1.0

INTRODUCTION

Section 1.0 provides introductory material for the regional Hazard Mitigation Plan (HMP). This section presents an overall purpose statement, documents the process used to develop the plan, and describes the planning area in detail.

1.1 PURPOSE STATEMENT

This multi-jurisdictional hazard mitigation plan has been completed in accordance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000. The guidelines for the completion of this plan appear in the Code of Federal Regulations (CFR) under Title 44: Emergency Services, Part 201.6. The West Virginia Division of Homeland Security and Emergency Management (WVDHSEM) further monitored the planning process. Funding for the project was distributed by the WVDHSEM under the Pre-Disaster Mitigation (PDM) program.

The Brooke-Hancock-Jefferson Metropolitan Planning Commission (BHJ) acted as the lead agency for the completion of this plan. BHJ contracted the creation of the document out; the plan was completed between September, 2010, and November, 2011.

The *Brooke-Hancock-Jefferson Metropolitan Planning Commission Multi-Jurisdictional Hazard Mitigation Plan* is considered "multi-jurisdictional" for several reasons. In addition to the county governing bodies of Brooke and Hancock County, all ten (10) municipal member governments participated in the data compilation and action plan development through the efforts of BHM and the individual county offices of emergency management. All municipalities are represented by at least one (1) project in the action plan. Further, all government entities in the region formally adopted the plan by resolution.

It is significant to note that this document mimics the all-hazards approach that the local emergency management community takes as part of its regular operation. Such a decision was considered prudent because county-level emergency management offices throughout the region are the ones charged with the maintenance and implementation (at a coordinating level) of many of the strategies listed in this plan. As such, this document assumes that the responsibility for mitigation activities rests with the lowest affected jurisdictional level, which is also consistent with the National Incident Management System (NIMS).

A number of documents were utilized as resources throughout the development of the HMP. References to these documents are, at times, direct and cited; other references are indirect and implied. This paragraph serves to formally recognize these documents.

- *BHJ Comprehensive Economic Development Five-Year Plan*
- *Brooke County Commodity Flow Study*
- *Brooke County Emergency Operations Plan*
- *Brooke County Multi-Jurisdictional Hazard Mitigation Plan*
- *Brooke and Hancock Regional Council Comprehensive Economic Development Strategy*
- *Hancock County Commodity Flow Study*
- *Hancock County Emergency Operations Plan*
- *Hancock County Multi-Jurisdictional Hazard Mitigation Plan*
- *Radiological Emergency Response Plan for the Beaver Valley Power Station*

Organization of the Plan

This plan has been organized in a way that both follows the federal criteria for hazard mitigation plans and is user-friendly.

- **Section 1.0: Introduction:** Describes the process used to develop the plan as well as profiles the planning area.
- **Section 2.0: Risk Assessment:** Identifies and profiles the hazard risks most probable throughout the region. This section also analyzes the regional implications of the risks (i.e., how does an occurrence of a hazard in one county affect the neighboring county). *NOTE: Hazard profiles contain averaged loss estimates. Such estimates are based on the county-specific loss estimates (and asset inventories), which are developed and maintained separately by individual jurisdictions.
- **Section 3.0: Mitigation Strategy:** Identifies mitigation projects to be undertaken by the member governments in the region. Again, the regional implications of implementing these projects are examined.
- **Section 4.0: Plan Maintenance Process:** Identifies the process by which the member governments plan to update their own mitigation efforts as well as how this document is to be maintained.

1.2 DOCUMENTATION OF THE PLANNING PROCESS

§201.6(b) and 201.6(c)(1)	An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information. [The 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.

To guide the completion of this plan, a multi-jurisdictional core planning team was established. This team was comprised of key officials with a stake in mitigation, and included the following:

- Beech Bottom, Town of – Mayor
- Bethany, Town of – Mayor
- Brooke County Emergency Management Agency (BCEMA) – Director
- Brooke-Hancock-Jefferson Metropolitan Planning Commission (BHJ) – Community Development Specialist
- Chester, Town of – Mayor
- Follansbee, City of – Mayor
- Hancock County Office of Emergency Management (HCOEM) – Director
- New Cumberland, Town of – Mayor
- Weirton Area Port Authority – President
- Weirton, City of – City Manager
- Wellsburg, City of – City Manager
- Windsor Heights, Town of – Mayor

Members of the planning committee represented a number of areas of mitigation. These included:

- Preventive Activities (representatives from local government, who have the authority to enact codes and ordinances for their jurisdictions, as well as BHJ representatives who are extensively involved in long-range comprehensive

planning);

- Property Protection (city managers and mayors represent their jurisdictions' zoning officers and both emergency managers serve as the county floodplain coordinators);
- Natural Resource Protection (BHJ representatives are involved in infrastructure upgrades, environmental projects, etc. throughout the region);
- Emergency Services (local emergency managers were present to represent the emergency services in each county); and
- Structural Projects (BHJ representatives are involved in infrastructure upgrades throughout the region);
- Public Information (local emergency managers coordinate the public information program for both counties).

This version of the plan represents the first required update for both Brooke and Hancock Counties. The BHJ facilitated completion of the entire update and, in 2010, procured the services of a consultant – JH Consulting, LLC of Buckhannon, West Virginia – to assist in the process. The consultant not only had a great deal of experience in mitigation planning, but also had established working relationships with both emergency management offices in the region. The planning committee reviewed each section of the plan at meetings and opted for a complete re-organization of the document o make both Brooke and Hancock County sections consistent and to make the plan more user friendly. To start the project, BHJ provided the consultant with copies of Brooke and Hancock County's existing mitigation plans as well as state-generated Hazus reports for the entire region.

A number of meetings were held – both stakeholder and public meetings – to discuss the planning process. These meetings were as follows:

- **May 12, 2011:** Primary topics included an overview of what would be updated and a discussion of the hazards to include (i.e., any new hazards or any significant "new" considerations for hazards already listed in the plan);
- **August 1, 2011:** Primary topics included a review of a draft of the risk assessment portion of the plan and the start to project list updates; and
- **October 21, 2011:** Primary topics included a wrap-up of the project list discussion and a timeline for adopting the revised plan. The public was invited to this meeting per a newspaper advertisement.

To add to the public participation process, BHJ published two (2) advertisements in newspapers serving the region inviting the public to visit the BHJ office to 1.) review both the existing mitigation plans and 2.) review the revised, regional document. A standard comment form was provided with file copies of the plan. No members of the general public took advantage of these opportunities. Further, BHJ placed an updated copy of the plan and the public comment form on its website for on-going public review during the next five (5) years.

Additional community agencies were involved in the planning process via the Local Emergency Planning Committees (LEPCs) for each county. The LEPCs were briefed on the plan by the local emergency managers, who chair the committees. The LEPCs are comprised of public health officials (both county health departments), medical discipline officials (representatives from Weirton Medical Center), industry officials (such as Koppers, Sal Chemical, and Ergon West Virginia), organizations such Mountaineer Race Track (in Hancock County), etc.

Additionally, to ensure that neighboring jurisdictions were aware of the mitigation efforts of Brooke and Hancock Counties, BHJ submitted a letter to the appropriate neighboring counties (i.e., Columbiana and Jefferson Counties in Ohio and Beaver and Washington Counties in Pennsylvania) with a summary of the plan's findings and an invitation to visit the BHJ office at any time to review the plan. BHJ also submitted a letter to the Bel-O-Mar regional council to the south indicating that it could review BHJ's plan at its convenience. BHJ also submitted letters to the Hancock County Solid Waste Authority, Top of WV Convention and Visitors Bureau, Brooke County Planning Commission, and the Soil Conservation Service.

ORIGINAL PLAN DEVELOPMENT PROCESS

Brooke County

Plan Methodology

Information in the plan was based on research from a variety of sources. Research was undertaken on the complete spectrum of natural hazards as per the Federal Emergency Management Agency's (FEMA's) guidelines. Existing mitigation plans from around the country and other West Virginia counties were consulted, as was documentation from the National Flood Insurance Program (NFIP) and various state and federal guidelines. In

addition, an extensive Internet search was conducted as well as a search of all FEMA documentation. Finally, research was conducted into existing historical data, not only on the county level but also state and federal levels. This data was later synthesized for risk assessment.

Mitigation Planning Committee

Despite best efforts, multi-jurisdictional participation could not be achieved by Brooke County. Brooke County and all participating municipalities understood that in order to successfully meet the criteria promulgated in the Disaster Mitigation Act (DMA) of 2000, a hazard mitigation planning team would have to be formed. Therefore, Brooke County incorporated as an established goal the formation of a mitigation planning committee to guide the mitigation planning process.

Public Involvement

Under the requirements of 44 CFR § 201.4(b) and § 201.4(c)(1), there must have been an open public involvement process in the formation of a plan. To aid public involvement, an exhaustive list of potential stakeholders was prepared and letters were sent in addition to email and phone correspondence. Public notices were included in newspapers and mass media to encourage participation.

To involve the public in the continued formation, implementation, and maintenance of this plan, Brooke County agreed to hold a number of public meetings in the future and after every yearly evaluation of the plan. A series of public meetings were held in conjunction with the county's regular emergency preparedness public outreach program, to fulfill the requirements set for the by 44 CFR § 201.4(b) and § 201.4(c)(1) for public involvement.

Goals of the Plan

The plan goals described steps which all citizens, organizations, and the county could implement to minimize the risks associated with disasters. Brooke County adopted the following broad-based hazard mitigation goals.

- **Protection of Life and Property:** Implement activities that assist in protecting lives by making homes, businesses, infrastructure and

critical facilities more resilient to losses from disasters; reduce losses and repetitive damages from chronic disaster events while promoting proper insurance coverage for such events; improve hazard assessment information to make recommendations for discouraging new development in disaster prone areas while promoting preventative measures for existing structures in disaster prone areas.

- **Public Awareness:** Develop and implement education and outreach programs to increase public awareness of the risks associated with natural disasters; provide information on tools, resources, partnership opportunities and funding opportunities to assist with implementing mitigation activities.
- **Balancing Environment and Mitigation:** Consider watershed planning, natural resource management, and land use applications and planning when considering hazard mitigation actions to protect life, property and the environment; preserve, rehabilitate and enhance natural watershed systems to serve as a hazard mitigation function.
- **Partnerships and Implementation:** Strengthen communication and coordinate participation among and within public agencies, citizens, community-based organization, and businesses to provide a vested interest in implementation; encourage leadership within public and private sector organizations to prioritize and implement local and county hazard mitigation activities.
- **Emergency Services:** Develop and implement policy to encourage and promote mitigation projects for critical faculties, services and infrastructure; improve emergency operations by increasing collaboration and coordination among public agencies, community-based organizations, businesses and government; coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Hancock County

The planning process utilized in Hancock County was based on the Section 322 local planning requirements of the DMA of 2000 and supporting guidance documents developed by FEMA and the West Virginia Office of

Emergency Services (WVOES). The planning process included the following steps:

- **Step 1:** Establish a core team;
- **Step 2:** Conduct the risk assessment;
- **Step 3:** Develop capabilities assessment;
- **Step 4:** Create mitigation plan; and
- **Step 5:** Adopt and implement plan.

To ensure participation from all jurisdictions, the Hancock County Commissioners identified a "core planning team" which would be involved in every aspect of the planning process. The core planning team members included:

- Director of Hancock County Office of Emergency Services,
- County Administrator,
- Mayor of New Cumberland,
- Mayor of Chester,
- Chief of Police in Weirton, and
- Assessor Office.

The core planning team began the development of the *Hancock County Hazard Mitigation Plan* with a thorough review of existing information. Plans and studies reviewed during the risk assessment and development of mitigation goals and strategies included:

- *Hancock County Emergency Operations Plan*,
- *Hancock County School Plan*,
- Brooke Hancock Local Emergency Planning Committee (LEPC),
- *New Cumberland Comprehensive Plan*,
- Weirton Redevelopment Authority, and the
- *Ohio County Hazard Mitigation Plan* (Draft).

Throughout the planning process, the core planning team participated in a series of meetings, several of which were open to the public. Initially, the core planning team met on the 17th of December, 2002, to discuss the planning

schedule. A meeting followed on the 29th of January, 2003, where team members organized themselves, identifying the Emergency Management Director as the "Core Team Leader" and made plans for involving the public in the planning process. After the public meetings were held, the core planning team met several times to identify additional goals and strategies and refine the Plan. Table 1.2.1 provides a list of all core planning team meetings.

Table 1.2.1

Hazard Mitigation Planning Meetings		
Date	**Location**	**Participants**
12/17/2002	HCOEM	Core planning team meeting
1/29/2003	HCOEM	Core planning team meeting
3/12/2003	Chester City Building	Public meeting
3/13/2003	Hancock County Commission Office	Public meeting
3/14/2003	Weirton City Building	Public meeting
3/17/2003	New Cumberland City Building	Public meeting
4/6/2003	New Cumberland Fire Department	Public meeting
4/7/2003	Oakland Fire Department	Public meeting
4/13/2003	Lawrenceville Fire Department	Public meeting
4/14/2003	Wells Building	Public meeting
5/8/2003	HCOEM	Core planning team meeting
5/21/2003	Hancock County Commission Office	Core planning team meeting
7/8/2003	HCOEM	Core planning team meeting

Throughout the plan's development process, there were several opportunities for public comment. The core planning team initially scheduled four (4) public meetings to take place in a variety of locations throughout the county during March, 2003. These meetings were intended to solicit public input regarding the risk assessment. Legal notices were published in the *Weirton Daily Times* and *Hancock County Courier* on February 27th and March 6th of 2003 to advertise the meetings. Unfortunately, the public chose not to attend.

In an effort to offer an additional opportunity for public participation, the core planning team scheduled four (4) additional public meetings in April, 2003. These meetings coincided with the draft plan's development and offered the public an opportunity to comment on the document. , Legal notices were again

published in the *Weirton Daily Times* and *Hancock County Courier* on March 19th and 26th of 2003,, to advertise the meetings. , Despite their best efforts to include the public in the planning process, the core planning team was unsuccessful. The public did not express an interest in attending the meetings.

1.3 RECORD OF CHANGES

To determine which sections would be kept and consolidated into this document, the Hazard Mitigation Planning Committee (HMC) reviewed and analyzed each section of both Brooke and Hancock Counties' plans. The decisions made as to the organization of this document are reflected in the table below.

Section	Description of Change
	INTRODUCTION
General, Section-Wide Revisions	• Created regional format
1.1 Purpose Statement	• Added section
1.2 Documentation of the Planning Process	• Consolidated Section Three from each original plan into this section • Added notes per the regionalization process • Added methodology for this update • Described composition of BHJ (i.e., Region 11) committee
1.3 Record of Changes	• Added section
1.4 Regional Profile	• Consolidated Section One from each original plan into this section • Added regional demographics for all participating jurisdictions • Updated demographics per updated Census • Included Section 4.4 from each original plan (i.e., development trends) into this section
	RISK ASSESSMENT
2.1 Hazard Identification	• Consolidated Sections 4.1 and 4.3 from each original plan into this section • Added a probability versus severity discussion • Standardized the asset inventory listings with Worksheet #3b from FEMA how-to series • HMC committee reviewed the hazard list at the first stakeholders meeting and opted to eliminate urban fires from Brooke's original list (because urban fires are typically handled by local fire companies and not considered area-wide hazards) and extreme heat from Hancock's original list (because heat rarely stays hot enough for a long enough time to cause significant problems) • HMC decided to add civil disturbance per request from local law enforcement and radiological hazards per request from local emergency management

Section	Description of Change
2.2 Hazard Profiles	• Consolidated Section 4.2 from each original plan into this section • Only compiled profiles for the hazards identified in 2.1 (from the first committee meeting) • Updated mapping • Added elements from the *West Virginia Enhanced State Mitigation Plan*, as appropriate • Compiled total historical occurrences per NCDC and other sources • Utilized Worksheet #3a from the FEMA how-to series to compile worst-case scenario loss estimates for each profiled hazard
2.3 Regional Implications	• Added section
	MITIGATION STRATEGY
General, Section-Wide Revisions	• Consolidated Section Six from Brooke County's original plan and Section Five from Hancock County's original plan into this section
3.1 Goals, Objectives, and Strategies	• After consultant-led discussion at second stakeholders' meeting, HMC listed status as completed, deleted, deferred, or on-going for all existing projects • HMC added new projects to list at second meeting • Projects listed by jurisdiction, with a set of regional projects at the start
3.2 Identification and Analysis of Mitigation Actions	• Consolidated Section Five from Brooke County's original plan and Section Six from Hancock County's original plan into this section • HMC discussed the status of all on-going projects at the second committee meeting; consultant took notes and used those notes to describe the status of each project • Projects listed by jurisdiction, with a set of regional projects at the start
3.3 Implementation of Mitigation Actions	• Projects listed by jurisdiction, with a set of regional projects at the start • All projects prioritized by jurisdictional representatives virtually (via telephone and internet) with consultant after second meeting
3.4 Regional Implications	• Added section
4.0 Plan Maintenance Process	• Consolidated Section Seven from each original plan into this section • HMC discussed how this plan would be maintained at both committee meetings; notes incorporated into this section • Integration of existing planning mechanisms, such as BHJ's CEDS, Weirton Area Port Authority efforts, county planning committee efforts, etc. into narrative

Section	Description of Change
	APPENDICES
Appendix 1	• Added section • Included all Hazus reports provided by WVDHSEM
Appendix 2	• Added section • Included Worksheet #3a from FEMA how-to series for each county and each hazard
Appendix 3 Glossary	• Consolidated Appendix C (Brooke) and Appendix B (Hancock) from original county plans into this section and updated accordingly
Appendix 4	• Added section • Consolidated all adoption materials from original county plans (i.e., Section Two and Appendix A [Brooke] and Appendix F [Hancock] from the original plans)

1.4 REGION PROFILE

The Brooke-Hancock-Jefferson Metropolitan Planning Commission's (BHJ's) West Virginia regional council (i.e., "Region 11") is comprised of a total of ten (10) member governments, two (2) of which are counties and eight (8) of which are municipalities. Table 1.3.1 lists the member governments.

Table 1.3.1

NAME	TYPE	COUNTY
Beech Bottom	Village	Brooke
Bethany	Town	Brooke
Brooke	County	N/A
Chester	City	Hancock
Follansbee	City	Brooke
Hancock	County	N/A
New Cumberland	City	Hancock
Weirton	City	Brooke, Hancock
Wellsburg	City	Brooke
Windsor Heights	Village	Brooke

Transportation

The transportation network of the Region 11 area includes four (4)-lane, divided highways, two (2)-lane roadways, and single-lane roadways. This network passes through a mostly rural area; many of the routes are traverse relatively steep grades. The primary transportation routes through the BHJ area are as follows:

- US Route 22,
- US Route 30, and
- State Route 2.

Secondary routes are as follows:

- State Route 8,
- State Route 27,
- State Route 68, and
- State Route 88.

Economy

In both counties, the economy (i.e., local work force) is comprised highly of the manufacturing, government, and hospitality industries. Table 1.3.2 shows the top four (4) industries in each county, with the number of individuals employed by each.

Table 1.3.2

Top Industries by Jurisdiction				
County	*INDUSTRY 1 Name (#)*	*INDUSTRY 2 Name (#)*	*INDUSTRY 3 Name (#)*	*INDUSTRY 4 Name (#)*
Brooke	Education & Health (2,048)	Manufacturing (1,960)	Government (1,024)	Leisure & Hospitality (918)
Hancock	Manufacturing (2,839)	Leisure & Hospitality (2,534)	Trade, Transportation & Utilities (1,932)	Government (1,405)

Source: WVBEP

A Weirton, several commercial expansion projects are underway in the Three Springs Drive area. Such expansion would benefit both counties. Both counties employ Economic Development Authorities (EDAs) that work to bring development and jobs to the counties. The top employers, by jurisdiction, are as follows (*Source: WV Bureau of Employment Programs*).

- Brooke County
  - Weirton Medical Center
  - Severstal Wheeling Steel
  - Brooke County Board of Education
  - Ball Metal Food Container Corporation
  - Bethany College

- Hancock County
  - Mountaineer Resort
  - Arcelor Mittal Weirton
  - Homer Laughlin China Company
  - Hancock County Board of Education
  - Bellofram

Climate

The climate of the area served by BHJ is generally a humid continental climate with warm to hot, humid summers and cold winters, increasing in severity with elevation. The weather, however, is subject to change. The plant hardiness zones (as determined by the United States Department of Agriculture [USDA]) are typically a zone 6a with the northern-most portions of Hancock County bordering a 5b area.

Brooke County experiences a continental climate influenced by air masses that originate in northern North America and the Gulf of Mexico. Low-pressure systems that travel north through the Ohio Valley create vacillating temperatures that create episodes of freezing and thawing during the winter months. Snowfall averages 40 inches per year with average wintertime temperatures around 25 degrees. Thunderstorms and wind storms are common during the months of June and July when temperatures routinely reach the mid 80s to high 90s. Rainfall averages 38.5 inches per year with the majority of rain occurring during the humid summer months.

The Ohio River defines the Hancock County's northern and eastern borders. The county is comprised of many hills and valleys as well as an intricate network of streams. Hancock County enjoys a rather moderate climate that varies by season. The annual mean temperature is 51 degrees Fahrenheit. Hancock County typically experiences 36.7 inches of precipitation annually.

DEMOGRAPHICS

Demographic data has been consolidated based on Census data from each of the counties unless otherwise noted.

Population

The population of the area represented by BHJ is 54,745 according to 2010 Census data. A breakdown by counties is shown in Figure 1.3.1 (*Source: US Census Bureau*). Generally speaking, the majority of the population is located in the western portions of the region. Such a figure could be expected given the presence of major thoroughfares such as SR 2.

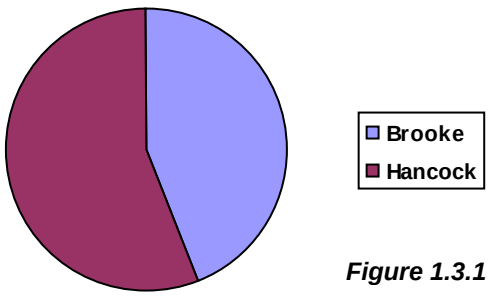


Figure 1.3.1

It could also be said, however, that the areas most densely populated are in and around Weirton. With a population of 19,746, approximately 36% of the region's population resides in Weirton.

Further, nearly 60% of the population in the region lives within a municipality (approximately 32,783 residents). Many of the municipalities lie along the arterial transportation routes of the region: State Route (SR) 2, US 22, and US 30. (Bethany lies along SR 88.) As much as 58% of the total regional population lives along these routes.

Housing

As with population, it is not surprising to see a higher concentration of housing units along major transportation routes. There are over 25,500 housing units in the region. On average, 74% of residents in the region own their own homes. (The average median value of housing is $84,450.)

Figure 1.3.2 shows the distribution of housing across the region. Table 1.3.3 provides a more detailed overview of the housing characteristics in each one of the counties (*Source: US Census Bureau*).

Figure 1.3.2

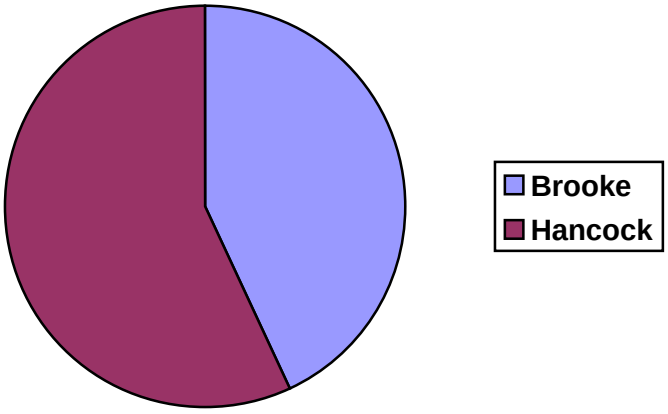


Table 1.3.3

Housing Characteristics in Region 11 Counties		
Demographic	*Brooke*	*Hancock*
Housing Units	10,967	14,541
Owner Occupied	8,335	10,615
Renter Occupied	2,632	3,926
Ownership Rate	76.0%	73.0%
Median Value	$84,200	$84,700

UTILITIES

Primary utilities are provided by a number of different companies. Electricity is provided by Allegheny Power and Mon Power. Those two (2) companies are currently in the process of going under the First Energy "umbrella"; as a result, service areas are somewhat in flux. Natural gas service is provided by Mountaineer Gas throughout the region.

Water and wastewater service is also provided in a variety of ways. Six (6) organizations provide water service in Hancock County: Grant Public Service District (PSD), New Cumberland, Newell, Oakland PSD, Tomlinson PSD, and Weirton. In Brooke County, water is provided by Beech Bottom, the Brooke County PSD, Follansbee, Hammond PSD, Washington Pike PSD, and Wellsburg.

Bethany, Chester, Follansbee, New Cumberland, Weirton, and Wellsburg are the municipalities that provide public wastewater service. The Brooke County PSD provides sewer service to the unincorporated areas of Brooke County along with Beech Bottom and Windsor Heights. The Hancock County PSD provides sewer service to the unincorporated areas of Hancock County.

ANALYZING DEVELOPMENT TRENDS: CURRENT AND FUTURE LAND USE

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

Both counties in the region are largely rural, yet both do contain significant industrial areas. The counties indicated that the majority of the commercial and industrial development in their counties is located in or near the municipalities. Several development sites have been established along the primary roadways

throughout the region.

Three (3) primary transportation routes drive development in the region. US 22 is the major east-west corridor through the Weirton area (passing through both counties). US 22 is also a major thoroughfare for the Steubenville area and, west of the region, through Allegheny County, Pennsylvania and the Pittsburgh metropolitan region. US 22's status as an arterial is evident through such industries as Weirton Steel (i.e., Arcelor Mittal) and the Half Moon Industrial Park in western Weirton. US 30 runs east-west through the northern-most portions of the region and spurs development in the Chester, Newell, and East Liverpool (OH) areas. Such industries as Homer Laughlin China and the Ergon, West Virginia oil refinery utilize this route. The other route contributing to development is SR 2, which runs north-south through the region, loosely following the path of the Ohio River. Many of the region's industrial areas follow the river.

There are a number of development projects occurring in the region, ranging from infrastructure upgrades to commercial developments. The City of Weirton is working on a sewer plant upgrade that has been mandated by the United States Environmental Protection Agency (USEPA). The other major infrastructure project for Weirton is a water distribution project, which could be considered a mitigation project. Recently, the city's main line went down and the city was without public water for approximately one (1) week. The West Virginia National Guard (WVNG) was called in as were a number of water buffalos. The current project would create a redundant system so that such a failure would not happen again. The city is also doing some commercial expansion on Three Springs Drive next to its new Wal-Mart Super Center.

Oakland PSD in Hancock County is currently undertaking a water project that includes a plant upgrade and extension of service to approximately 86 new customers. The City of Wellsburg is currently undertaking a number of projects, including a sewer line project, sewer plant upgrade, and a water plant upgrade. Also, the Brooke County PSD is undertaking a large sewer project. If funded, approximately 550 Brooke County residents would have access to public wastewater treatment service.

Currently, there are two (2) Brownfields projects underway in the region: one (1) near Wellsburg and the other near Chester. These projects will help mitigate a number of environmental hazardous material concerns. Tables 1.3.4 and 1.3.5 list

the projects underway throughout the region as well as the estimates hazards to which they are most vulnerable.

Table 1.3.4 – Brooke County

Targeted Development Areas	Primary Potential Hazard
WELLSBURG – Sewer line project	Land Subsidence, Flooding
WELLSBURG – Sewage treatment plant upgrades	Land Subsidence (generally), Flooding, Hazardous Materials (per treatment)
WELLSBURG – Water plant upgrade	Land Subsidence, Hazardous Materials (per treatment)
WELLSBURG – Brownfields project	Hazardous Materials
Brooke County PSD sewer project	Land Subsidence

Table 1.3.5 – Hancock County

Targeted Development Areas	Primary Potential Hazard
CHESTER – Brownfields project	Hazardous Materials
Oakland PSD water project	Land Subsidence (through construction activities), Hazardous Materials (generally)

The projects for Weirton are not included in the above tables because the city "splits" the county line. Additionally, projects for the city directly affect (and benefit) both counties. The following list includes the Weirton projects with likely hazards.

- WEIRTON – Sewer plant upgrade (Hazardous materials per treatment)
- WEIRTON – Water project (Hazardous materials generally)
- WEIRTON – Three Springs Drive commercial expansion (Hazardous materials per transport on US 22)

Both Brooke and Hancock County have seen an increase in oil and natural gas exploration activities, focusing on both the Marcellus and Utica shale formations. Much of this development is occurring in rural areas (though the more urban areas are not exempt), and many residents and local leaders are concerned about the additional heavy traffic on local roadways as well as the potential effects on the region's groundwater resources. Locally, there has also been some concern over the "put back" regulations throughout the drilling industry. Returning the areas to their pre-development conditions has created some issues for the PSD projects.

Significant changes in land use are not expected. As such, local officials and emergency managers should concentrate mitigation efforts on the existing high-density population areas and those along arterial transportation routes.

SECTION 2.0

RISK ASSESSMENT

Section 2.0 is a multi-hazard risk assessment, analyzing primarily the natural hazards affecting the entire region. This particular assessment includes brief analyses of the hazardous material and terrorism risks. In addition to a simple identification of applicable hazards, this section profiles those hazards (i.e., describes them in the regional context) and discusses the regional implications of these hazard risks.

It is important to understand that the risk assessment portion of this planning process was cyclical. For example, hazards were identified and analyzed on an "area-wide" basis. Upon completion of the initial assessment, such factors as targeted development areas, the locations of critical facilities, etc. were compared to the initial data. Where warranted, additional risk analysis was done in those areas to determine the primary hazards affecting, for example, a potential development. Further, determining probability and severity could be affected by the presence of a number of critical facilities or developable areas in a "hazard zone".

2.1 HAZARD IDENTIFICATION

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

The hazard identification serves as a guide to all communities in the Brooke-Hancock-Jefferson Metropolitan Planning Commission (BHJ) planning district when assessing their vulnerabilities to hazards. The purpose of the hazard identification is to (1) identify all the natural hazards that could affect the planning area, (2) assess the extent to which the area is vulnerable to the effects of these hazards, and (3) prioritize the potential risks to the community.

Hazard Identification

The following chart – Table 2.1.1 – Illustrates the hazards to which the planning area could be susceptible. The table also includes a list of the research sources used to identify the hazards as well as a brief statement justifying their inclusion in this analysis. Those hazards with justification for inclusion in the hazard profiling section are highlighted in yellow. In addition to all sources identified in the following table, each county's original hazard mitigation plan was also used as a

research source.

It is significant to note that it is not the intent of Table 2.1.1 to list all occurrences of the hazards in consideration. Table 2.1.1 simply seeks to demonstrate that a particular hazard is indeed worthy of further risk analysis.

Table 2.1.1

HAZARD	HOW IDENTIFIED	WHY IDENTIFIED
Avalanche	• Research indicates that these jurisdictions are not susceptible to this hazard.	• The general contour of the land in the region is mountainous, but they are not steep enough to cause avalanche activity. • Further, the amount of snowfall the region receives is insufficient for any kind of avalanche.
Civil Disturbance	• Interviews w/ Local Officials	• Local officials have indicated that gang violence from areas such as Steubenville and East Liverpool could "spill over" and affect both counties. • An increase in drug trade activity could lead to greater violence in the area.
Coastal Erosion	• MapQuest	• Coastal erosion is not a significant risk as the region is more than 450 miles from the Atlantic Ocean.
Coastal Storm	• See "Thunderstorm"	• Coastal storms are not a threat to the region as it is more than 450 miles from the Atlantic Ocean.
Dam Failure	• WV Department of Environmental Protection (WVDEP) Dam Safety • Interviews w/ Local Officials • Internet Research http://itouchmap.com	• There are a number of flood control structures in Brooke County (that are overseen by the Soil Conservation Service). • The New Cumberland Lock & Dam facility is located adjacent to Hancock County.
Debris Flow	• See "Land Subsidence"	• See "Land Subsidence"
Drought	• National Climatic Data Center (NCDC) Event Records	NCDC reported two (2) droughts that affected both counties in 1999.

HAZARD	HOW IDENTIFIED	WHY IDENTIFIED
Earthquake	• US Geological Survey (USGS) • Internet Research http://www.earthquake.gov	• According to the USGS, the counties in the region range from a 2 to a 3 in Peak Ground Acceleration (PGA) with a 10% chance of exceedance in 50 years. • While perceived shaking is expected to be light and damage minimal, USDHS Federal Emergency Management Agency (FEMA) still recommends analyzing hazards in areas with these PGAs.
Expansive Soils	• See "Land Subsidence"	• See "Land Subsidence"
Extreme Heat	• NCDC Event Records	• Temperatures in the region seldom exceed 100 degrees. • If the temperature meets or exceeds 100 degrees, it has not been hot enough for the amount of time appropriate to denote "extreme heat".
Flooding	• NCDC Event Records • Interviews w/ Local Officials	• NCDC reports the following: o Brooke – 33 since 1994 o Hancock – 21 since 1995 • Local officials unanimously indicated that flooding was the most probable hazard in all jurisdictions.
Hailstorm	• NCDC Event Records	NCDC reports the following: • Brooke – 10 hail events since 1993 • Hancock – 21 hail events since 1982
Hazmat Incident	• Brooke County Tier II filings • Hancock County Tier II filings • *Hancock County Commodity Flow Study*, 2008 • *Hancock County Vulnerability Assessment*, 2009 • Interviews w/ Local Officials	• Both counties contain "covered facilities" that report the use and storage of hazardous materials to the appropriate Local Emergency Planning Committee (LEPC).

HAZARD	HOW IDENTIFIED	WHY IDENTIFIED
Hurricane	• See "Thunderstorm"	• The region does not experience the hurricane conditions of extremely high winds, rains, and hail. • In some instances, the region may be affected by rainfall brought about by the remnants of a hurricane, which are addressed elsewhere.
Land Subsidence	• Interviews w/ Local Officials • Internet Research http://www.nationalatlas.gov	• Evaporate rock formations, which are present through some parts of the region, are prone to caves and sink holes. • According to local officials, land subsidence problems sometimes restrict access into and out of Wellsburg.
Landslide	• See "Land Subsidence"	• See "Land Subsidence"
Radiological Hazards	• Interviews w/ Local Officials	• Hancock County is in the Emergency Planning Zone (EPZ) for the Beaver Valley Nuclear Power Station.
Terrorism	• Interviews w/ Local Officials	• The industrial infrastructure of the area could make it attractive to domestic/ international terrorists.
Thunderstorm	• NCDC Event Records	NCDC reports the following: • Brooke – 87 reported thunderstorms since 1957 • Hancock – 88 reported thunderstorms since 1974
Tsunami	• MapQuest	• The Atlantic Ocean is approximately 450 miles from the region. • The Appalachian Mountains will most likely protect the area from a tsunami affecting the US east coast.
Volcano	• USGS	• No volcanoes exist on the east coast.
Wildfire	• Interviews w/ Local Officials	• Local fire companies indicate frequent brush fires during dry seasons.
Wind	• NCDC Event Records	NCDC reports the following: • Brooke – 10 high wind events since 1995 • Hancock – 11 high wind events since 2001

HAZARD	HOW IDENTIFIED	WHY IDENTIFIED
Winter Storm	• NCDC Event Records	NCDC reports the following: • Brooke – 27 winter storm events since 1993 • Hancock – 28 events since 1993

Over an area as large as that covered by BHJ, it seems intuitively obvious that the hazards listed in Table 2.1.1 above would not affect the entire region in the same manner. To capture this concept, Table 2.1.2 depicts the region's county jurisdictions in comparison. The baseline hazard risk is a generalized average in each county. If a county appears to be more or less affected by a particular hazard, evidence was sought through research. The variances in risk are discussed in Section 2.2 below.

Table 2.1.2

JURISDICTION	HAZARDS													
	Civil Disturbance	***Dam Failure***	***Drought***	***Earthquake***	***Flooding***	***Hailstorm***	***Hazmat Incident***	***Land Subsidence***	***Radiological Hazards***	***Terrorism***	***Thunderstorm***	***Wildfire***	***Wind***	***Winter Storm***
Brooke County	=	=	=	=	=	=	=	>	<	=	=	=	=	=
Hancock County	=	=	=	=	=	=	=	<	>	=	=	=	=	=

KEY:

=: Equal risk

<: Lower risk

>: Higher risk

Probability vs. Severity Explanation

The historical data collected includes accounts of all the hazard types listed above. Some hazards, however, have occurred much more frequently than others with a wide range of impacts. By analyzing the historical frequency of each hazard along with the associated impacts, the hazards that pose the most significant risks to

the BHJ planning district can be identified. Such an analysis allows participating communities to focus mitigation strategies on those hazards that are most likely to cause significant losses.

Prioritizing the potential hazards that can threaten the planning district is based on two (2) separate factors:

- The probability that a potential hazard will affect the community, and
- The potential impacts to the community in the event that such a hazard occurs (i.e., severity).

The probability of a hazard event occurring is largely based on the historical recurrence interval of the hazard. Such sources as the NCDC's "event record database", local media archives, and interviews with local officials were used to determine the number of occurrences. If repeated coverage was given to a particular hazard event, that event was considered highly probable to occur. Also, local officials were able to verify or identify those hazards occurring frequently. For instance, if flood damage occurs every five (5) years versus a tornado causing damage every 50 years, the flood probability would score much higher than the tornado.

Figure 2.1.1

CALCULATING AVERAGE HAZARD OCCURRENCES

Thirty-three (33) floods were reported in Brooke County and 21 were reported in Hancock County.

(33 + 21)/2 = 27 Floods (avg)

Probability for each county jurisdiction in the region was calculated in comparison to one another. For instance, the total number of hazard events reported in each county was averaged to determine the number of occurrences of each hazard on a regional basis. Figure 2.1.1 explains this calculation with an example.

With these figures, another computation determined the average number of total hazard events. The average number of total hazards (12.4) was used as the median to determine probability. Table 2.1.3 depicts this calculation. The distance above or below the median was determined by a percentage.

Table 2.1.3

CALCULATING MEDIAN HAZARD OCCURRENCES													
Civil	***Dam***	***Drought***	***Quake***	***Flood***	***Hail***	***Hazmat***	***Sub.***	***Radio.***	***Terror***	***Thunder***	***Fire***	***Wind***	***Winter***
0	0	2	1	27	15.5	2	1	0	0	87.5	0	10.5	27.5
AVERAGE (Sum of Averages / 14):													**12.4**

**NOTE: Averages for each hazard were calculated per Figure 2.1.2 above.*

Table 2.1.4 lists the classifications considered for hazard probability. The percentages were used to determine the appropriate "hazard probability classification". For instance, 0 – 20% was listed as improbable, 21 – 40% was listed as remote, 41 – 60% was listed as occasional, 61 – 80% was listed as probable, and 81 – 100% was listed as frequent.

Table 2.1.4

Hazard Probability Classifications

Label	***Specific Hazard Event***	***Frequency***
Frequent	Likely to occur frequently	Continuously experienced
Probable	Will occur several times in the life of an item	Experienced several times
Occasional	Likely to occur sometime in the life of an item	Experienced
Remote	Unlikely but possible to occur in the life of an item	Unlikely that it has been experienced
Improbable	So unlikely that it can be assumed occurrence may not be experienced	Not experienced

The hazard's severity is made up of three (3) separate factors: the extent of the potentially affected geographic area, the primary impacts of the hazard event, and any cascading (or secondary) effects. While primary impacts are a direct result of the hazard, secondary impacts can only arise subsequent to a primary impact. For example, a primary impact of a flood may be road closures due to submerged pavement. A possible secondary impact in such an incident would be restricted access of emergency vehicles due to a road closure.

Severity calculations, on the whole, were less exact. The median and various averages were calculated as outlined above for probability. The figures used for the severity calculations, however, were estimates with no mathematical basis. Loss

figures presented with NCDC event records, local official recollections, and the loss estimates for each hazard presented in previous versions of each individual county's hazard mitigation plans were used to compare severity. Percentages were again used.

As with probability, severity classifications were made. Table 2.1.5 lists the severity classifications that were considered. Percentage assignments were as follows:

- 0 – 25%: Negligible;
- 26 – 50%: Marginal;
- 51 – 75%: Critical; and
- 76 – 100%: Catastrophic.

Table 2.1.5

Hazard Severity Classifications

Description	*Mishap Definition*
Catastrophic	Death or major structural loss
Critical	Severe injury, severe illness, or marginal structural damage
Marginal	Minor injury, minor illness, or structural damage
Negligible	Less than minor injury, illness, or structural damage

It should be noted that the percentages detailed above do **not** correspond to the percentage of structures affected in the area. As with probability, documented losses from hazard events in the region were used to determine an average loss per hazard. For flooding, all documented losses were divided by the number of recorded events to arrive at an "average flooding loss". The average losses for all hazards were then used to derive an "overall average loss" number per hazard. **The percentage represents the distance from the median loss figure.** For example, based on documented losses, the average flooding loss ($36,416,000) far exceeded (i.e., by more than 600%) the calculated overall average loss number ($5,502,321), resulting in the "catastrophic" designation. By comparison, the average thunderstorm loss of $822,500 only calculated to 14.9% of the overall average loss number, hence the negligible determination for thunderstorms.

Figure 2.1.2 combines the probability and severity information into a "risk assessment matrix" that generalizes the potential impact of each hazard included in

the plan. This is the figure that was re-formatted into a bar graph as described above.

Figure 2.1.2

Risk Assessment Matrix

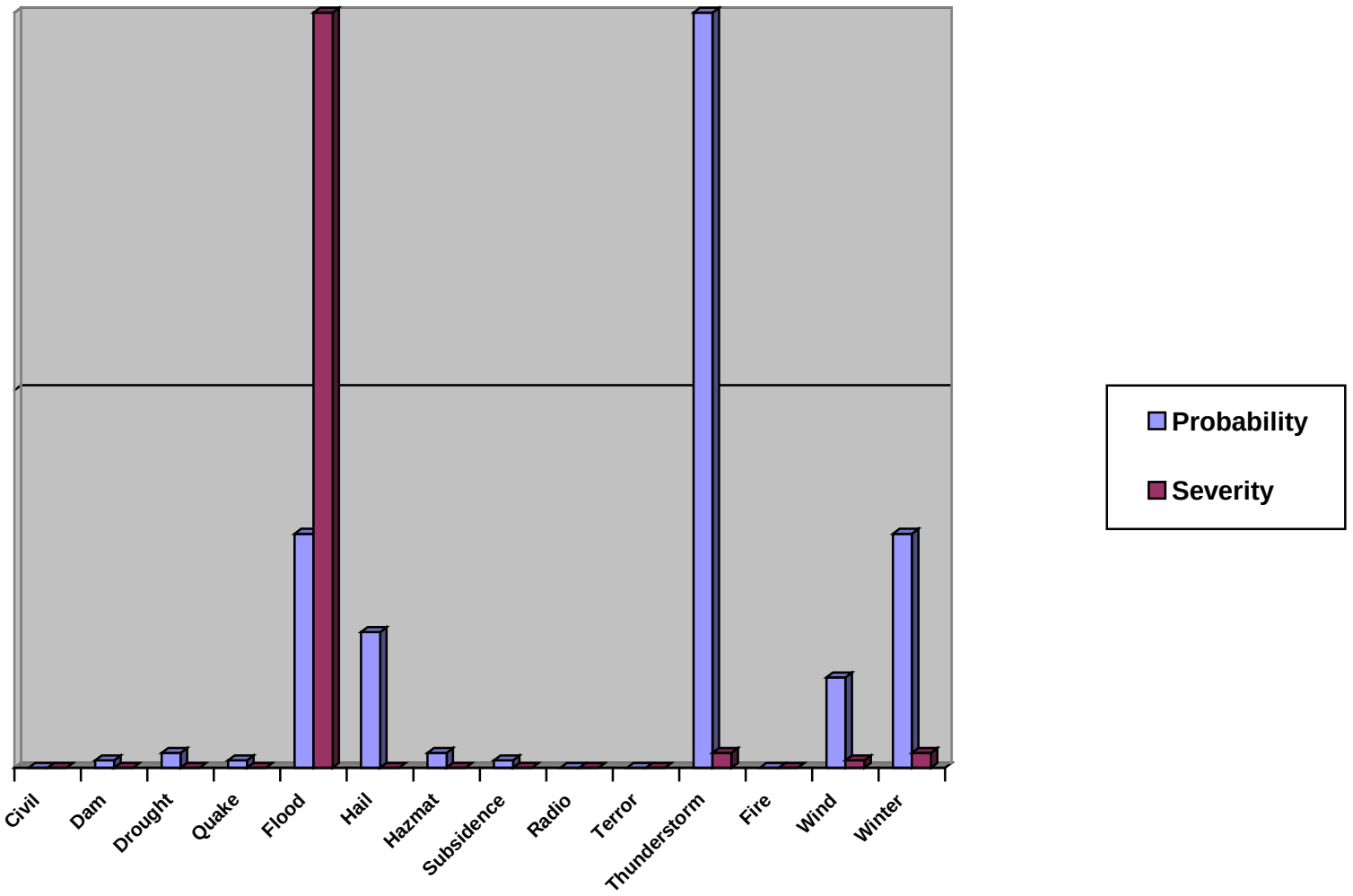
Hazard Severity	***Hazard Probability***				
	Frequent	Probable	Occasional	Remote	Improbable
Catastrophic	**Flooding**				
Critical					
Marginal					
Negligible	**Thunderstorm, Winter Storm**	**Hailstorm**	**Wind**	**Drought, Earthquake, Hazmat, Subsidence, Terrorism**	**Civil Disturbance, Dam Failure, Radiological, Wildfire**

Figure 2.1.3 below was created to enhance the usability of the plan. It provides a more holistic snapshot of risk in terms of probability and severity in a format that is more familiar to most readers of this plan. To create the bar graph, the following approximations were used.

- Probability
  - Frequent = 4
  - Probable = 3
  - Occasional = 2
  - Remote = 1
  - Improbable = 0

- Severity
  - Catastrophic = 4
  - Critical = 3
  - Marginal = 2
  - Negligible = 1

Figure 2.1.3


Civil
Dam
Drought
Quake
Flood
Hail
Hazmat
Subsidence
Radio
Terror
Thunderstorm
Fire
Wind
Winter
Probability
Severity

Inventorying Assets

This risk assessment identifies "at-risk" community assets such as critical facilities, critical infrastructure, historical properties, commercial/industrial facilities, etc. "Assets" contribute directly to the quality of life throughout the region as well as ensure its continued operation. As such, government facilities are often listed, as are water/wastewater and transportation infrastructure. "Assets" can also be irreplaceable items within the community, such as historical structures or even vulnerable populations (including the elderly or youths).

Inventorying assets first involves determining what in the community can be affected by a hazard event. The core planning committee maintains a specific list of community assets as part of this plan. (*NOTE: Individual jurisdictions may also maintain these types of lists for their own areas.) Assets were grouped into the following categories.

- **Critical Facilities:** Governmental facilities, water/wastewater facilities, dams, emergency services facilities, medical facilities (hospitals/clinics), military facilities, and the transportation infrastructure.
- **Vulnerable Populations:** Schools, nursing homes, and senior centers.
- **Economic Assets:** Large commercial/industrial facilities or large employers (not covered in other categories).
- **Special Considerations:** Residences, community outreach facilities, post offices, and libraries.
- **Historical Considerations:** Areas/structures listed on the National Register of Historic Places.

While compiling the inventory, much information can be gathered that could assist in estimating the impact that the loss of each asset could have on the community. Each specific asset is listed with its size, replacement value (structure only), contents value, function use or value (annual operating budget), displacement cost ($ per day), and occupancy. Following is a brief description of how the above numbers are derived.

- **Size:** County assessor data or by directly contacting the facility.
- **Replacement Value:** County assessor data or by directly contacting the facility.

- **Contents Value:** Directly contacting the facility.
- **Function Use or Value:** Directly contacting the facility.
- **Displacement Cost:** Function Use or Value divided by 365.
- **Occupancy:** Directly contacting the facility.

Table 2.1.6 lists the assets identified throughout the BHJ planning area. This matrix is loosely derived from Worksheet #3b in the FEMA 386-2, *State and Local Mitigation Planning How-To Guide: Understanding Your Risks* document.

The matrix also contains a denotation of risk as low ("L"), moderate ("M"), or high ("H"). Such a denotation corresponds loosely with the mapping in the hazard profiles below, especially for such broad-based hazards as thunderstorm or earthquake. The site-specific hazards, though, such as flooding, hazardous material incident, terrorism, etc., list donations for the facility itself. In other words, the facility may be in an area labeled as moderately susceptible to hazardous materials (for example), yet listed as "low" since the risk in that area is primarily related to transportation.

Figure 2.1.6

Region 11 Asset Inventory

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
A.T. Allison Elementary	HANCOCK COUNTY		**X**									
Alexander Campbell Mansion	WV 67, BETHANY					**X**						
Allison Elementary School	600 Rail Road St, CHESTER		**X**									
Ann's Country Retreat	Washington Pike, WELLSBURG				**X**							
Apostolic Faith Assembly Church	RR 2, BEECH BOTTOM				**X**							
Arcelor Mittal Weirton Inc.	WEIRTON		**X**									
Ballyntine Landfill	Rt 2 and Shilode Rd, NEW CUMBERLAND				**X**							
Ballyntine Mines	Rt 2 South of NEW CUMBERLAND			**X**								
Beech Bottom	Beech Bottom				**X**							
Beech Bottom Community Church	BEECH BOTTOM				**X**							

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Beech Bottom Primary School	High Street, BEECH BOTTOM		**X**									
Beech Bottom VFD	3rd St, BEECH BOTTOM	**X**										
Beech Bottom VFD - Station 9	6 3rd Street, BEECH BOTTOM	**X**										
Belleview Water Tank	Belleview Dr, WEIRTON	**X**										
Bellofram Corp	HANCOCK COUNTY		**X**									
Bethany College	BETHANY		**X**									
Bethany Primary School	BETHANY		**X**									
Bethany VFD	BETHANY	**X**										
Blue Ridge Manor	WELLSBURG		**X**									
Bridges	N/A	**X**										
Broadview School	Circle Dr, WEIRTON		**X**									
Brooke County Courthouse	Main Street, WELLSBURG	**X**										
Brooke County Public Library	Main Street, WELLSBURG				**X**							
Brooke County Sheriff's Department	632 Main, WELLSBURG	**X**										
Brooke High School	Rd #3 Box 610, WELLSBURG		**X**									

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Brooke Hills Park	BROOKE COUNTY		X									
Brooke Mobile Court	BROOKE COUNTY		X									
Castleman Run Church	WELLSBURG				X							
Castleman's Run Dam	BROOKE COUNTY	X										
Central Junior High School	BROOKE COUNTY					X						
Cesare's Court	BROOKE COUNTY		X									
Chapel Hill Church	WELLSBURG				X							
Cherry Lake	Ridge Road and Cemetary Hill Rd, BROOKE COUNTY	X										
Chester City Building	375 Carolina Ave, CHESTER					X						
Chester Sewege Treatment Plant	Louella Ave, CHESTER	X										
Chester Volunteer Fire Department	CHESTER	X										
Chester Water Tank	Puramus Rd, CHESTER	X										
Chester Water Treatment Plant	Pan Ave, CHESTER	X										
Christ Apostolic Temple	WEIRTON				X							

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Christ Episcopal Church	1014 Main St, WELLSBURG				**X**							
Church of Christ	Neville St, FOLLANSBEE				**X**							
Church of Christ	112 Sunset Ave, WELLSBURG				**X**							
City of Follansbee	FOLLANSBEE				**X**							
City of Weirton	WEIRTON	**X**										
City of Wellsburg	WELLSBURG				**X**							
Clay-Lin Manor	BROOKE COUNTY				**X**							
CM Tech	South Chestnut St, NEW CUMBERLAND				**X**							
Collier Primary School	270 Pennsylvania Ave, WEIRTON		**X**									
Colliers FD	339 Penna Ave, WEIRTON	**X**										
Conrail Railroad	Elm St, Newell, HANCOCK COUNTY			**X**								
Crescent Brick	Clifton St, NEW CUMBERLAND				**X**							
Dr. George Rigas House	HANCOCK COUNTY					**X**						
Ebenezer Church	FOLLANSBEE				**X**							

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Edgewood School	WEIRTON		**X**									
Episcopal Church of the Good Shepherd	FOLLANSBEE				**X**							
Ergon-West Virginia	Rt 2 Congo Rd Box 356, Newell, HANCOCK COUNTY			**X**								
First Baptist Church of Wellsburg	1805 Charles St, WELLSBURG				**X**							
First Christian Church	FOLLANSBEE				**X**							
First Church of Nazarene	835 Washington Pike, WELLSBURG				**X**							
First Methodist Church	FOLLANSBEE				**X**							
First National Bank Graham Building	HANCOCK COUNTY					**X**						
First Presbyterian Church	901 Charles St, WELLSBURG				**X**							
Follansbee Middle School	Main St & Mark Ave, FOLLANSBEE		**X**									
Follansbee Police Department	872 Main St, FOLLANSBEE	**X**										

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Follansbee VFD	1061 Main St, FOLLANSBEE	**X**										
Franklin Community VFD	960 Washington Pike, WELLSBURG	**X**										
Franklin Primary School	1305 Washingotn Pike, WELLSBURG		**X**									
Franklin United Methodist Church	1340 Washington Pike, WELLSBURG				**X**							
Free Methodist Church	1340 Washington Pike, WELLSBURG				**X**							
Goodwill Church	FOLLANSBEE				**X**							
Gus's Trailer Court	BROOKE COUNTY		**X**									
Hammond School	BROOKE COUNTY					**X**						
Hanccok County Courthouse	Court St, NEW CUMBERLAND	**X**										
Hancock County Board of Education	Court Street, NEW CUMBERLAND		**X**									

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Henderson Chapel African Methodist Episcopal Church	Main St, WELLSBURG				**X**							
Hooverson Heights Primary School	200 Rockdale Rd, FOLLANSBEE		**X**									
Hooverson Heights VFD	116 May Rd, FOLLANSBEE	**X**										
Italian Christian Church	FOLLANSBEE				**X**							
J&L Mobilie Home Park	BROOKE COUNTY		**X**									
JD Rockefeller Career Center	Rt 2 North Rocky Slide Rd, NEW CUMBERLAND		**X**									
Jefferson Elementary School	Jefferson St, Newell, HANCOCK COUNTY		**X**									
Jefferson School	1098 Jefferson St, FOLLANSBEE		**X**									
Johnston Truax House	HANCOCK COUNTY					**X**						
Kadesh Chapel	WELLSBURG				**X**							

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Lake Bison	Route 8 and Bison Lake Rd, New Manchester, HANCOCK COUNTY	**X**										
Lawrenceville Volunteer Fire Fepartment	HANCOCK COUNTY	**X**										
Liberty Elementary School	Culler Rd, WEIRTON		**X**									
Little Blue Run	County Highway 16, CHESTER			**X**								
Madonna High School	Park Ave, WEIRTON		**X**									
Mahan School	BROOKE COUNTY		**X**									
Main Drive Subdivision	BROOKE COUNTY		**X**									
Marland Heitghts Park and Margaret Mansion Weir Mermorial Pool	WEIRTON					**X**						
Marshall House	HANCOCK COUNTY					**X**						
McKinleyville VFD	Rd #1 Box 142B, WELLSBURG	**X**										

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Millsop School	Legion & Swearingen Rd, WEIRTON		**X**									
Mountaineer Race Track	Route 2 PO Box 358, Newell, HANCOCK COUNTY			**X**								
Murray Maes F House	HANCOCK COUNTY					**X**						
New Cumberland City Building	Court St, NEW CUMBERLAND					**X**						
New Cumberland Police Department	NEW CUMBERLAND	**X**										
New Cumberland Volunteer Fire Department	SR 2, NEW CUMBERLAND	**X**										
New Cumberland Water Tank	Cemetary Hill Rd, NEW CUMBERLAND	**X**										
New Cumberland Water Treatment Plant	South Chestnut St, NEW CUMBERLAND	**X**										
New Manchester School	Main St, New Manchester, HANCOCK COUNTY		**X**									

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
New Manchester Volunteer Fire Department	HANCOCK COUNTY	**X**										
New Manchester Water Tank	Wylie Ridge Rd, NEW CUMBERLAND	**X**										
Newell Volunter Fire Department	HANCOCK COUNTY	**X**										
Newell Water Treatment Plant	Grant St, Newell, HANCOCK COUNTY	**X**										
Oak Glen High School	Route 8 Gas Valley Rd, New Manchester, HANCOCK COUNTY		**X**									
Oak Glen Middle School	Sixth St, CHESTER		**X**									
Oakland District Volunteer Fire Department	HANCOCK COUNTY	**X**										
Oakland Water Tank	Wylie Farm Swearingen Hill RR1 166 R, WEIRTON	**X**										
Old Bethany Church	BETHANY				**X**							
Old Main	WELLSBURG											
Peace Point	BETHANY				**X**							

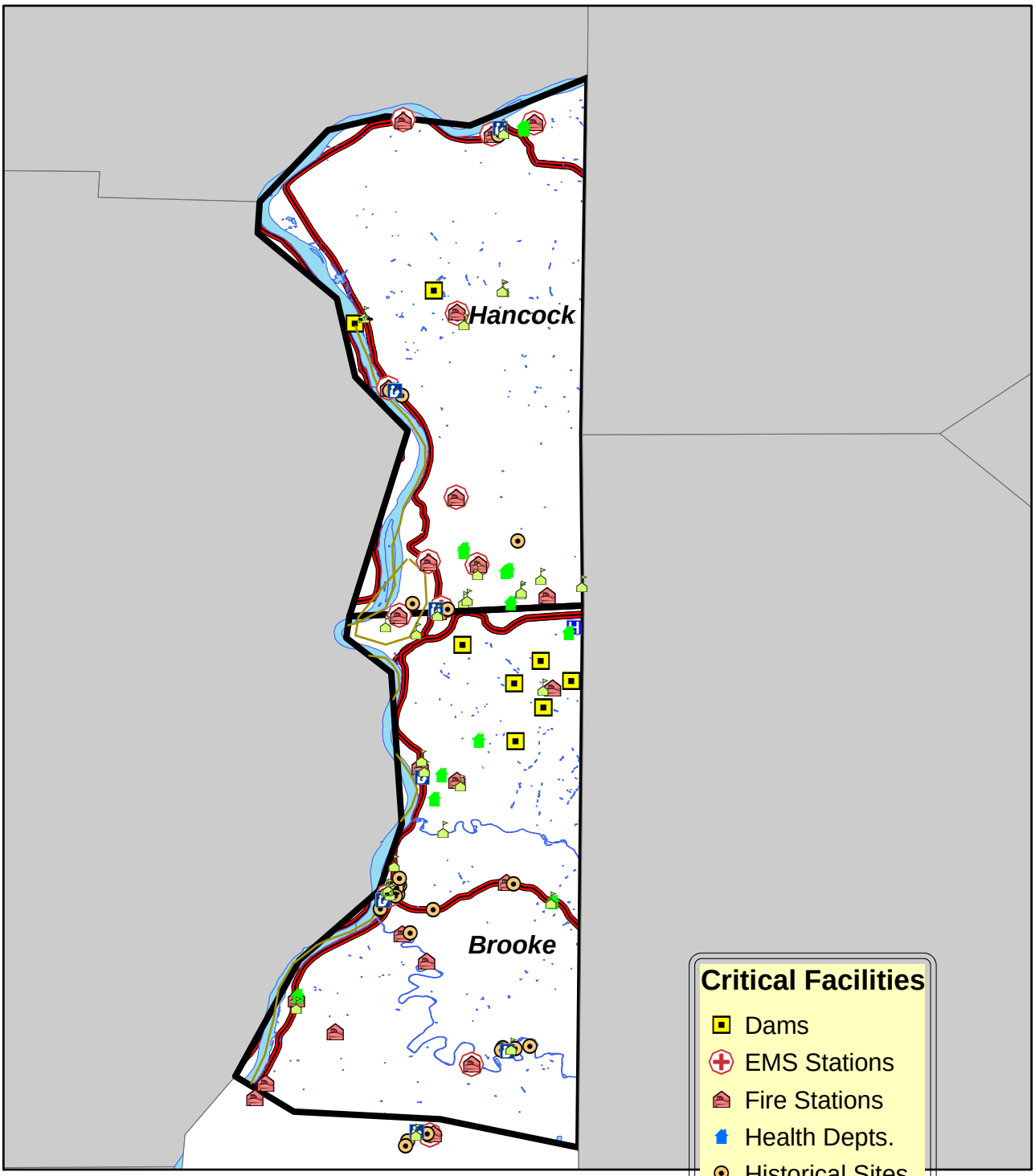
Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Peoples Bank	HANCOCK COUNTY					**X**						
Peter Tarr Furnace Site	HANCOCK COUNTY					**X**						
Railways	N/A	**X**										
Reorganized Church of Jesus Christ of Latter Day Saints	WELLSBURG				**X**							
Residences	N/A				**X**							
Residential Board Care	108 Lee Road, FOLLANSBEE				**X**							
Riverview School	BROOKE COUNTY					**X**						
Roadways	N/A	**X**										
Saint Andrews School	BROOKE COUNTY		**X**									
Saint Anthony's Roman Catholic Church	FOLLANSBEE				**X**							
Saint Francis Centre	805 Lee Rd, FOLLANSBEE				**X**							
Saint John the Evangelist Roman Catholic Church	1300 Charles St, WELLSBURG				**X**							
Saint Johns Church	FOLLANSBEE				**X**							
Saint Johns School	WELLSBURG		**X**									

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Saint Joseph School	15 Michael Way, WEIRTON		**X**									
Saint Luke's Baptist Church	WELLSBURG				**X**							
Saint Paul School	Walnut St, WEIRTON		**X**									
Short Creek VFD	BROOKE COUNTY	**X**										
Steel Works Credit Union	3501 Main St, WEIRTON				**X**							
Stillson's Mobile Home Court	BROOKE COUNTY		**X**									
Stone Chapel Church	WELLSBURG				**X**							
Sunshine Flea Market	BROOKE COUNTY				**X**							
Sunview Trailer Court	FOLLANSBEE		**X**									
Tent Church	FOLLANSBEE				**X**							
The Homer Laughlin China Co	HANCOCK COUNTY		**X**									
Tomlinson Run Dam	Tomlinson Run Park off of Rt 8, New Manchester, HANCOCK COUNTY	**X**										
Town of Bethany	BETHANY				**X**							

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Trailer Court Apartments	BROOKE COUNTY		**X**									
Wal-Mart	WEIRTON		**X**									
Washington School	BROOKE COUNTY					**X**						
Waterford Park	WEIRTON					**X**						
Weir High	WEIRTON		**X**									
Weir Middle	WEIRTON		**X**									
Weirton Christian Academy	WEIRTON		**X**									
Weirton City Building	Cove Road & Main St, 200 Municipal Plaza, WEIRTON					**X**						
Weirton City Fire	WEIRTON	**X**										
Weirton Geriatic Center	WEIRTON		**X**									
Weirton Heights Elementary School	160 South 12th St, WEIRTON		**X**									
Weirton Heights Water Tank	Penco and Cove Rd, WEIRTON	**X**										
Weirton High School	Sinclair Ave, WEIRTON		**X**									
Weirton Medical Center	WEIRTON	**X**										
Weirton Middle School	Sinclair Ave, WEIRTON		**X**									

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
Weirton Police Department	WEIRTON	**X**										
Weirton Steel Corp.	Three Spring Drive, WEIRTON			**X**								
Wellsburg Christian Church	WELLSBURG				**X**							
Wellsburg City Hall	7th Street, WELLSBURG	**X**										
Wellsburg Detachment	1315 Commerce St, WELLSBURG	**X**										
Wellsburg Middle School	1447 Main St, WELLSBURG		**X**									
Wellsburg Police Department	70 7th St, WELLSBURG	**X**										
Wellsburg Primary School	1448 Main St, WELLSBURG		**X**									
Wellsburg United Methodist Church	WELLSBURG				**X**							
Wellsburg VFD	12 St, WELLSBURG	**X**										
Werirton Area Ambulance	WEIRTON		**X**									
Weirton Volunteer Co#1	WEIRTON	**X**										

Name or Description of Asset	Address Location/ Jurisdiction	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Size of Bldg. (sq. ft.)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($)	Occupancy or Capacity (#)
		X	X	X	X	X						
West Vriginia State Police Troop 1 New Cumberland Detachment	NEW CUMBERLAND	**X**										
Windsor Heights VFD	821 Main St, WINDSOR HEIGHTS	**X**										


Hancock
Brooke
Critical Facilities
Dams
EMS Stations
Fire Stations
Health Depts.
Historical Sites
Hospitals
Libraries
Nursing Homes
Schools
WVSP Barracks
Miles
0 0.5 1 2 3 4 5
N
W
E
S

2.2 HAZARD PROFILES

§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.

The section above identifies which hazards affect Brooke and Hancock Counties, but it does not explain *how* these hazards affect the counties. To do so, "profiles" have been developed for each hazard identified in Section 2.1. The profile describes how each hazard manifests itself in each of the Brooke-Hancock-Jefferson Metropolitan Planning Commission (BHJ) counties.

Each of the 14 profiles below contains estimated losses as a result of the hazard being profiled. All loss estimates were calculated in the same manner, which is as follows. See Appendix 2 below for copies of the applicable worksheets from each county.

Worksheet #3a from FEMA 386-2, *State and Local Mitigation Planning How-To Guide: Understanding Your Risks*, contains space for the total number of structures and the total value of structures. For each (the number and the value), a percentage in hazard-prone areas is identified. The values corresponding to the percentage in hazard areas correspond to the loss estimates for each category: residential, commercial, industrial, agricultural, religious/non-profit, government, education, and utilities.

Historical hazard event research often contains estimates of losses in a variety of categories, some of which correspond with the categories used in this plan; consequently, historical data contributed heavily to the process of determining potential damage percentages. During the hazard identification research for this project, planners noted loss totals from large incidents. Dollar amounts computed on Worksheet #3a are compared to those from historical events.

2.2.1: Civil Disturbance

A civil disturbance involves many people, often in protest of something. They can develop in as little as a few minutes or over several days. Disturbances often involve violence, which is what differentiates them from "demonstrations".

RESEARCH SOURCES

- Interviews with Local Officials

Period of Occurrence:	At any time
Number of Events to Date: (2004 – 2011)	N/A
Probability of Event:	Unlikely – Hazard is identified given presence of state government and numerous entertainment/athletic venues.
Warning Time:	None to Days
Potential Impacts:	Potential loss of human life, economic loss, disruption of lifeline facilities
Cause Injury or Death:	Injury and risk of multiple deaths
Potential Facility Shutdown:	N/A

HAZARD EFFECTS

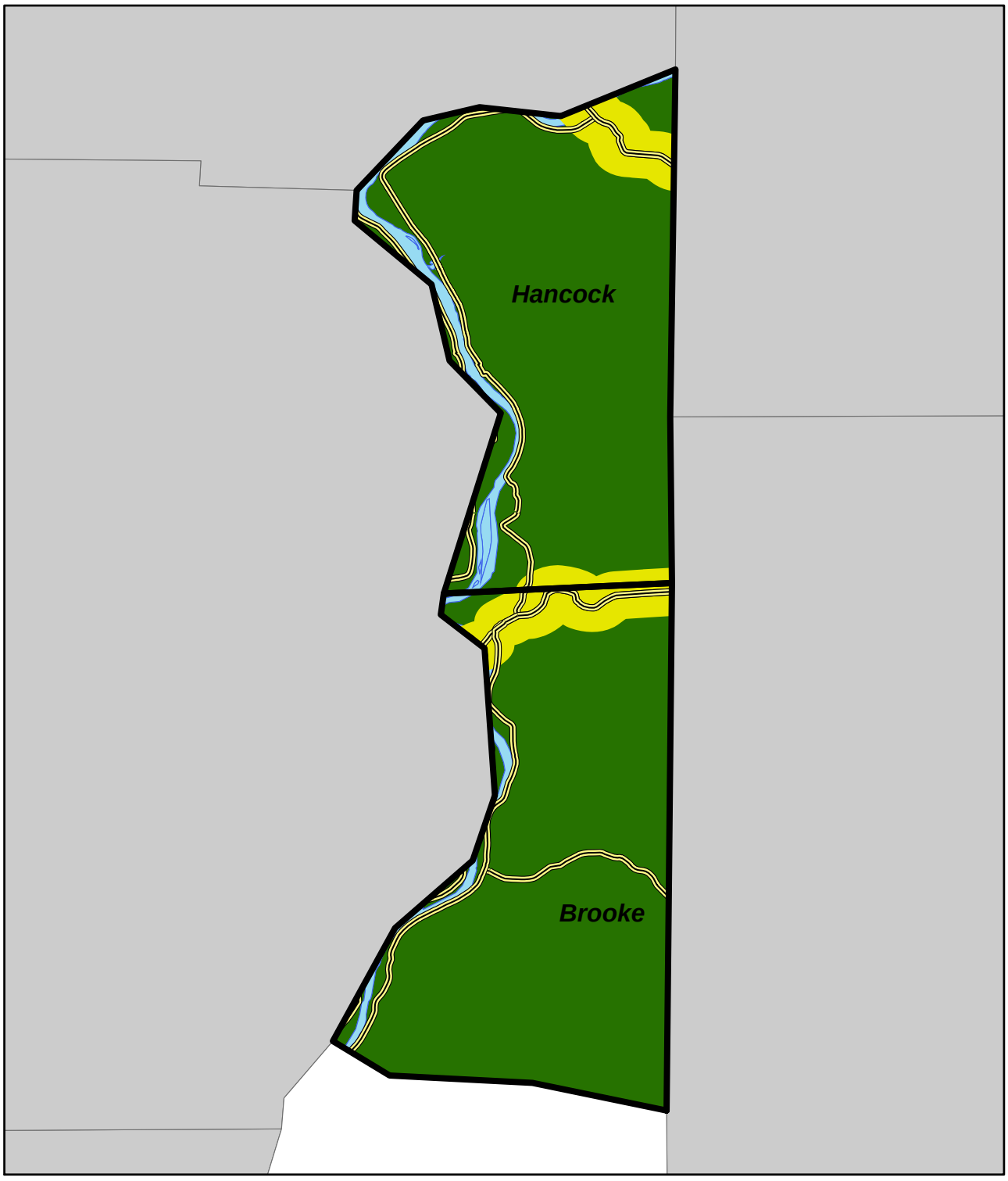
Brooke and Hancock Counties do contain events, assets, and facilities that could lead to civil disturbance situations. The region is home to a great deal of industry, which could lead to various types of demonstrations, sabotage, etc. Other local events, such as sporting events, could lead to smaller-scale disturbances. In terms of a "regional risk", civil disturbance should be defined, as evidenced by the range of possibilities to which the preceding sentence alludes.

To qualify as a civil disturbance contributing to regional risk, local authorities must be called upon to resolve the incident. A bar fight between two (2) or three (3) individuals, for example, would not qualify as a disturbance; yet a brawl involving ten (10) or more might. Further, a number of demonstrations could qualify. For example, if an anti-gun group or Ku Klux Klan rally were to be scheduled in the region, local authorities may be proactively deployed to keep peace. Such an event could qualify as a civil disturbance contributing to regional risk. Similar events have recently occurred throughout West Virginia as members of the Westboro Baptist Church have protested memorial services for miners killed at Sago and Upper Big Branch.

Local officials indicate that the area has been prone to experiencing gang activity as a result of the US 22 and US 30 corridors. Activity primary comes from the Youngstown, Ohio and Pittsburgh, Pennsylvania areas, but has been known to involve groups from as far away as Chicago, Philadelphia, and New Jersey. Most activity is related to the drug trade (i.e., heroin and cocaine). Thus far, nothing related to this gang activity would qualify as a civil disturbance; activity has consisted of late-night arrests of individuals. Local officials, though, feel that awareness is necessary to keep these types of incidents from evolving into regular large-scale civil disturbances.

LOSS ESTIMATES

In terms of losses to civil disturbances, accurate loss estimates on physical assets cannot be done without evidence of past events; additional functional losses could be incurred, but those cannot be accurately estimated either. For purposes of planning, physical loss estimates on residential, commercial, industrial, government, and educational facilities were calculated. As an average, as much as $8,022,406 could be incurred if all assets were affected maximally *per civil disturbance incident*. A worst-case scenario civil disturbance event could affect up to 71% of Brooke County's population and 41% of Hancock County's population, based on the density of the population along the US 22 corridor.


Hancock
Brooke
Vulnerability to Civil Disturbance
Low Hazard
Moderate Hazard

2.2.2: Dam Failure

A dam failure is when downstream flooding occurs as the result of the complete or partial inundation of an impoundment.

RESEARCH SOURCES

- WV Department of Environmental Protection (WVDEP) Dam Safety
- Interviews with Local Officials
- Internet Research (http://itouchmap.com)

Period of Occurrence:	At any time
Number of Events to Date (1950-2011):	0
Probability of Event:	Infrequent – Dams that fail typically have some deficiency that causes the failure that should be detected by regular inspections and subsequently repaired. Heavy rains or moderate earthquakes may trigger a dam failure.
Warning Time:	Minimal – Depends on frequency of inspection
Potential Impacts:	Potential loss of human life, economic loss, environmental damage, disruption of lifeline facilities
Cause Injury or Death:	Injury and risk of multiple deaths
Potential Facility Shutdown:	30 days or more

HAZARD EFFECTS

Dam failure is often the result of prolonged rainfall or flooding or, during prolonged dry periods, erosion. The primary hazard surrounding dam failure is the swift, unpredictable flooding of those areas immediately downstream. While general inundation areas can be determined, it is often impossible to know exactly how and where water held back by a dam will flow during a rapid failure of the dam.

Generally, there are three (3) types of dam failures: hydraulic, seepage, and structural.

- **Hydraulic Failure:** Hydraulic failures result from the uncontrolled flow of water over the dam, around and adjacent to the dam, and the erosive action of water on the dam and its foundation. Earthen dams are particularly vulnerable to hydraulic failure since earth erodes at relatively small velocities.

- **Seepage Failure:** All dams exhibit some seepage that must be controlled in velocity and amount. Seepage occurs both through the dam and the foundation. If uncontrolled, seepage can erode material from the foundation of an earthen dam to form a conduit through which water can pass. This passing of water often leads to a complete failure of the structure, known as piping.
- **Structural Failure:** Structural failures involve the rupture of the dam and/or its foundation. This is particularly a hazard for large dams and for dams built of low strength materials such as silts, slag, fly ash, etc.

Dam failures generally result from a complex interrelationship of several failure modes. Uncontrolled seepage may weaken the soils and lead to a structural failure. Structural failure may shorten the seepage path and lead to a piping failure. Surface erosion may lead to structural or piping failures.

The WVDEP classifies dams into four (4) categories, including the following:

- **Class 1 (High Hazard):** Dams located where failure may cause loss of human life or major damage to dwellings, commercial or industrial buildings, main railroads, important public utilities, or where a high risk highway may be affected or damaged.
- **Class 2 (Significant Hazard):** Dams located where failure may cause minor damage to dwellings, commercial or industrial buildings, important public utilities, main railroads, or cause major damage to unoccupied buildings, or where a low risk highway may be affected or damaged. Loss of human life from a failure of a Class 2 dam is unlikely.
- **Class 3 (Low Hazard):** Dams located in rural or agricultural areas where failure may cause minor damage to non-residential and normally unoccupied buildings, or rural or agricultural land. Failure of a Class 3 dam would cause only a loss of the dam itself and a loss of property use, such as use of related roads, with little additional damage to adjacent property.
- **Class 4 (Negligible Hazard):** Dams where failure is expected to have no potential for loss of human life, no potential for property damage, and no potential for significant harm to the environment.

HAZARD PROFILE

There are a number of dam facilities in the region that are used for a variety of purposes. The WVDEP maintains inspection schedules on two (2) facilities in Hancock County, the largest of which is the Cherry Lake Dam (a Class 1 structure). The other facility is a Class 2 structure. Further, local officials indicate that the Soil Conservation Service (SCS) out of McMechen coordinates operations and maintenance of a number of flood control dams in the region. According to local officials, these dams are located throughout the region (i.e., could not be considered to be "concentrated" in any one [1] area). Local officials in Hancock County further indicate that the Little Blue Lake dam near Chester is "dripping". A list of dam facilities includes the following (*Source:* WVDEP)

- Brooke County
  - Harmon Creek Structure #1
  - Harmon Creek Structure #2
  - Harmon Creek Structure #3
  - Harmon Creek Structure #4
  - Harmon Creek Structure #13
  - Harmon Creek Structure #14
  - Memorial Lake Dam
  - Burek Farm Pond
  - Castleman's Run Lake #1

- Hancock County
  - Little Blue Lake Dam
  - New Cumberland Locks and Dam
  - Tomlinson Run Dam

The presence of the Ohio River also places a number of navigational lock and dam facilities throughout the region. The New Cumberland Lock and Dam is the only facility located in the region. While primarily a navigational facility, were it to fail, water levels could considerably rise downstream and potentially cause flooding in parts of Weirton, Wellsburg, Beech Bottom, and Follansbee.

Additionally, both counties in the region are beginning to see a number of impoundments associated with the natural gas (i.e., Marcellus shale drilling) industry.

These facilities are located throughout the region, with a slightly higher density in the eastern portions of both counties. Both counties continue to monitor evolving regulations concerning the entire natural gas industry, including those regulating fracturing impoundments.

VULNERABLE STRUCTURES – WORST CASE SCENARIO EVENT

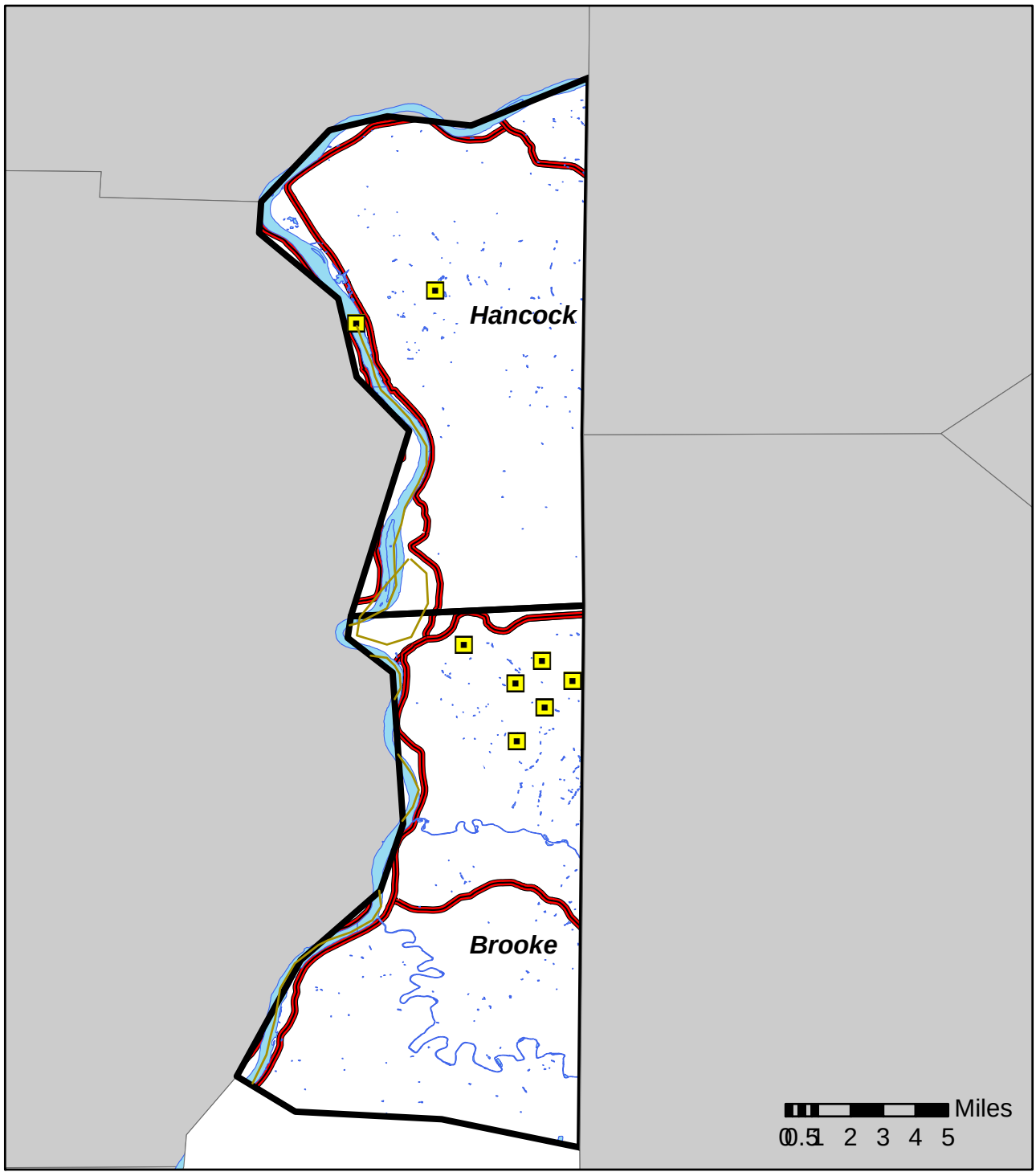
Vulnerable Structures – Dam Failure								
County	*Residential*	*Commercial*	*Industrial*	*Agricultural*	*Religious*	*Government*	*Education*	*Utilities*
Brooke	500	25	0	10	5	0	0	0
Hancock	1,381	80	0	5	2	1	1	1
TOTALS	**1,881**	**105**	**0**	**15**	**7**	**1**	**1**	**1**

It is difficult to assume a worst-case scenario event being a concurrent failure of all dams in the region (as would be suggested by the table above). The worst-case scenario for Brooke County would involve a dam failure that could impact Wellsburg. In such an instance, in excess of 2,500 residents could be affected as well as over 1,000 structures. The local government could be impacted as could a large segment of the county's economy.

In Hancock County, the worst-case scenario would likely be a failure of the New Cumberland Lock and Dam, which would primarily impact the economy of the region. Low lying areas in New Cumberland, Weirton, and Wellsburg (in Brooke County) could be impacted.

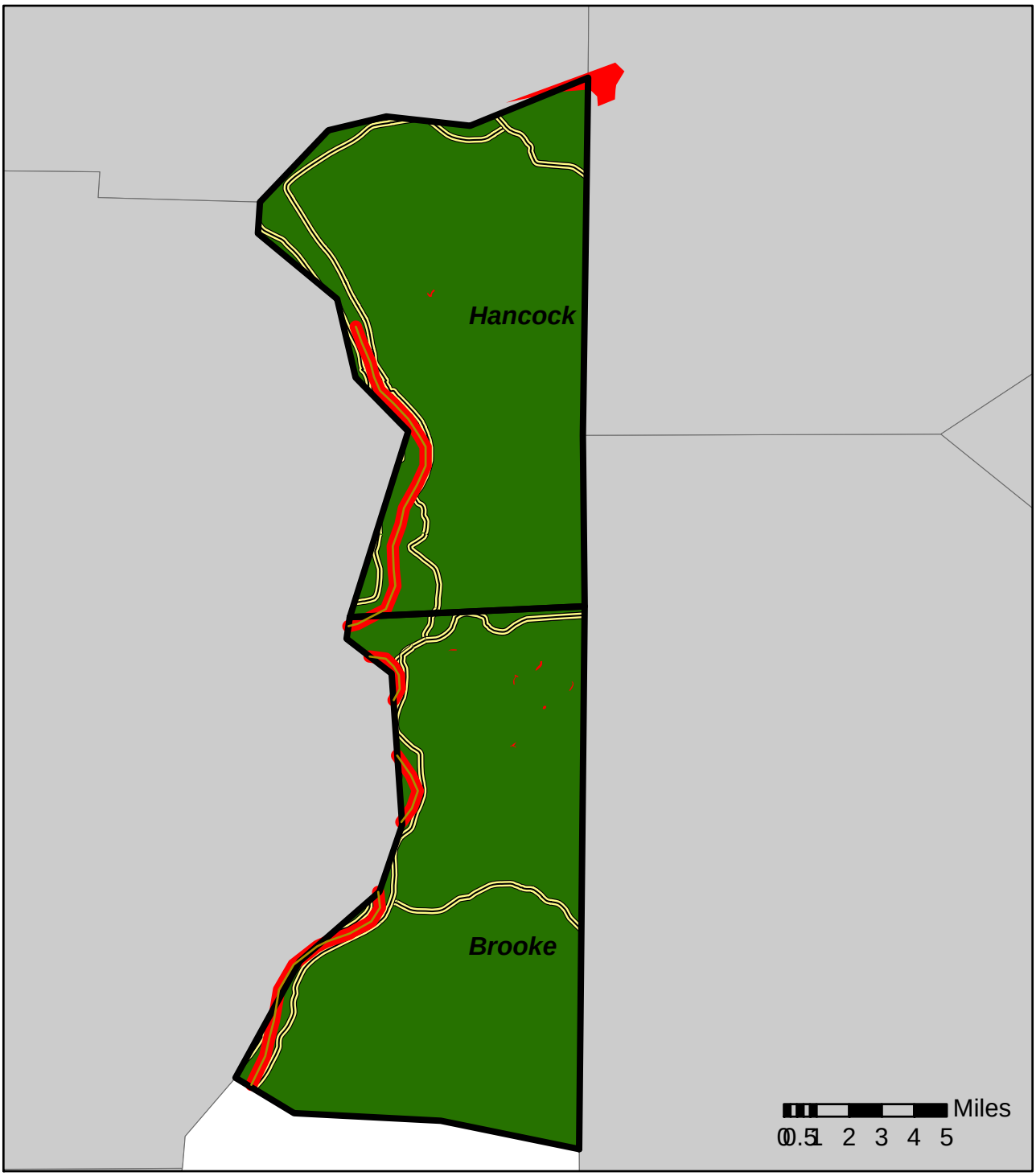
LOSS ESTIMATES

In an effort to assist jurisdictional understanding of risks and implementation of strategies, loss estimates were done for each county (see Appendix 2). By averaging those estimates, this plan assumes a total, regional loss estimate *per dam failure incident* to be as much as $198,602,753.



Dam Facilities in Region 11

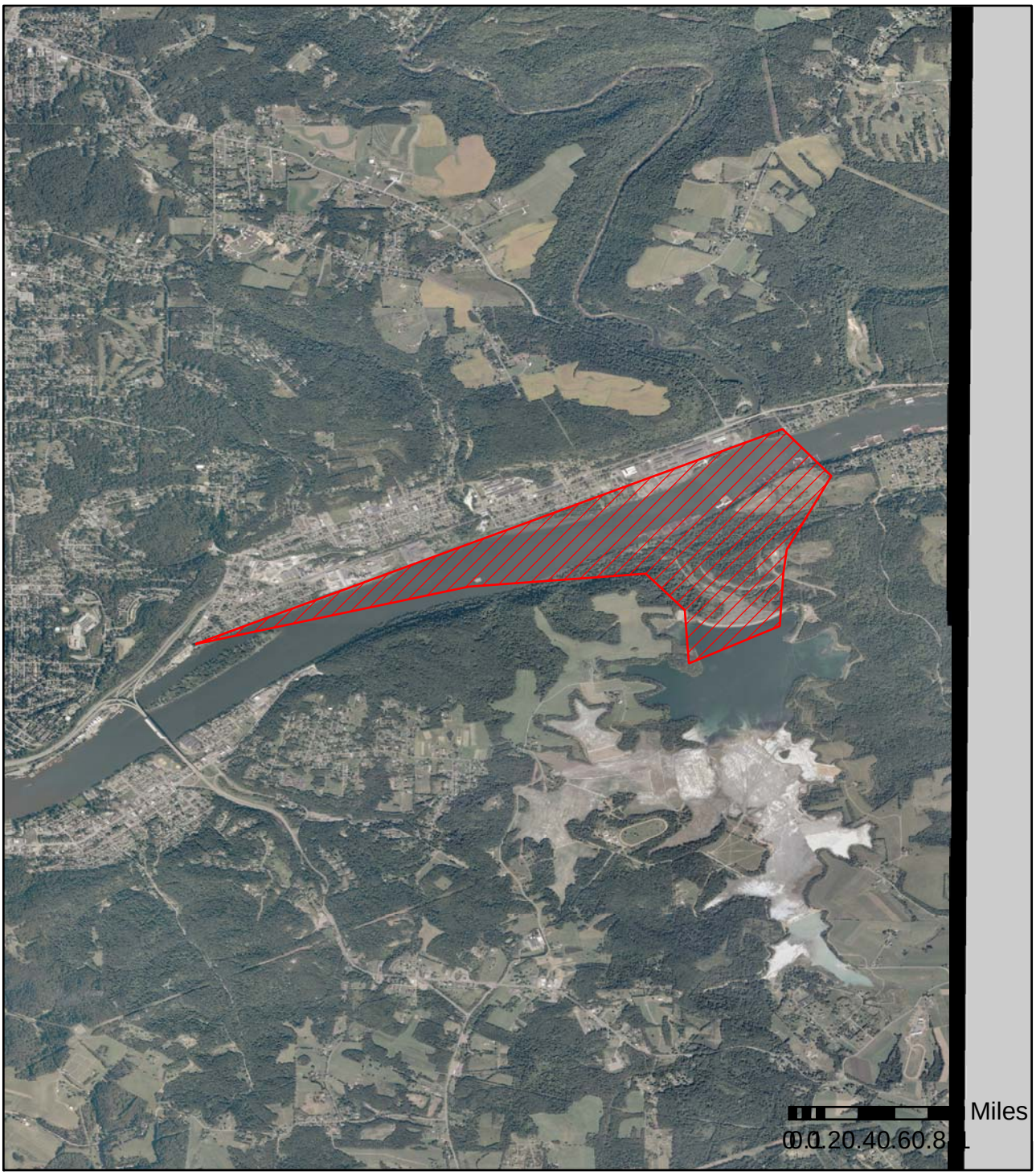
Dams



Vulnerability to Dam Failure

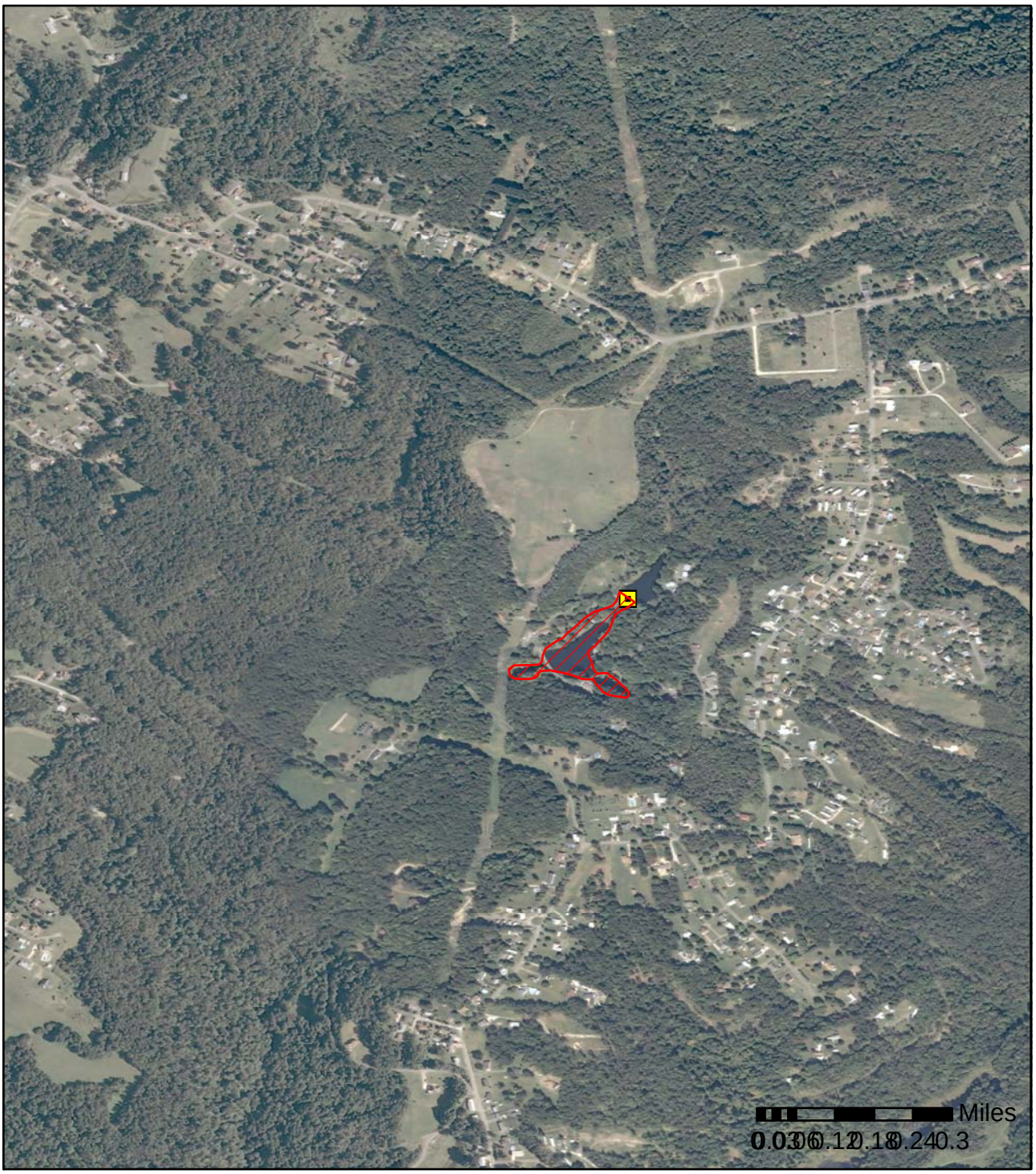
High Hazard

Low Hazard



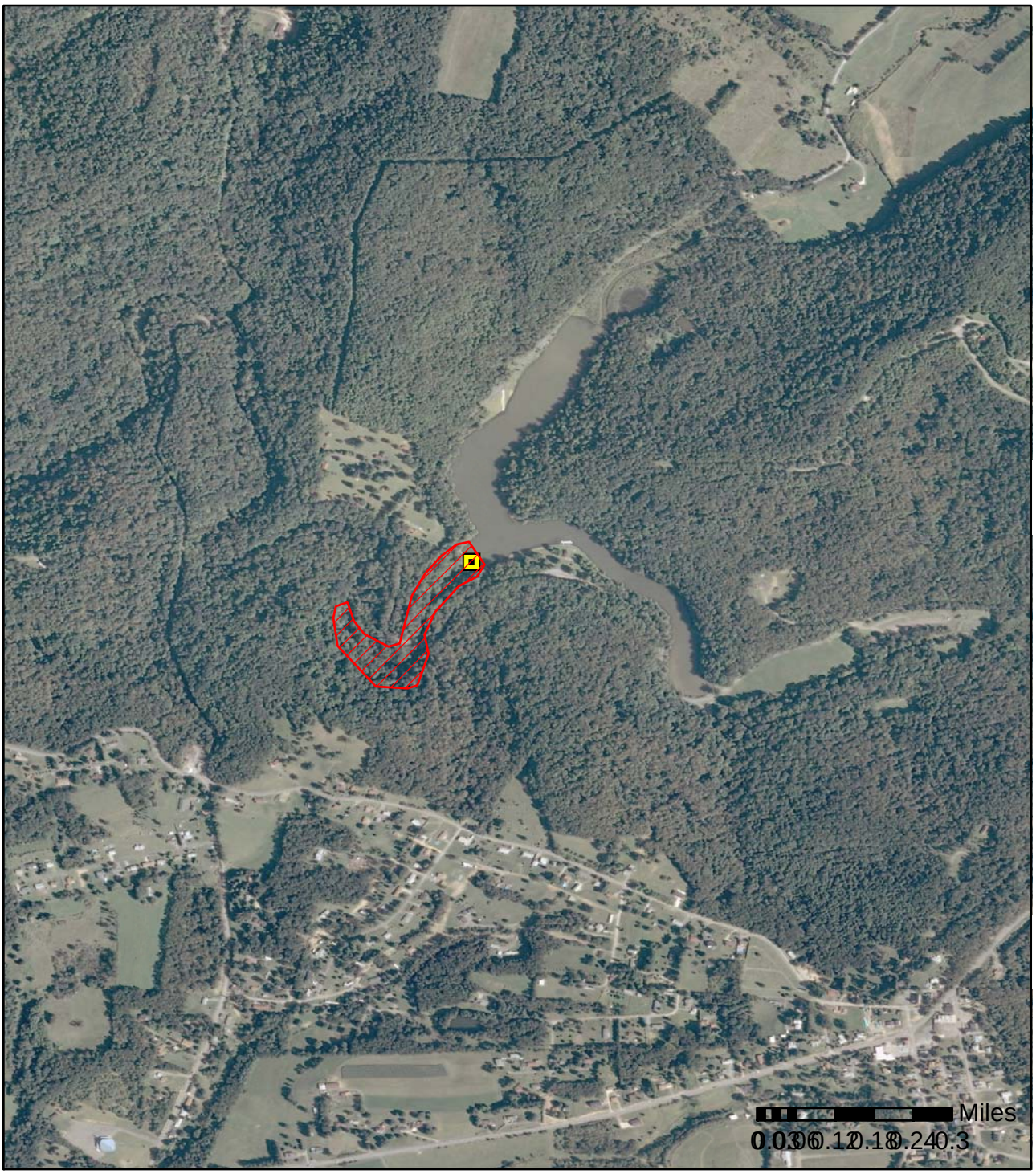
Vulnerability to Dam Failure

Little Blue Run Lake Dam Failure



Vulnerability to Dam Failure

Memorial Lake Dam Failure

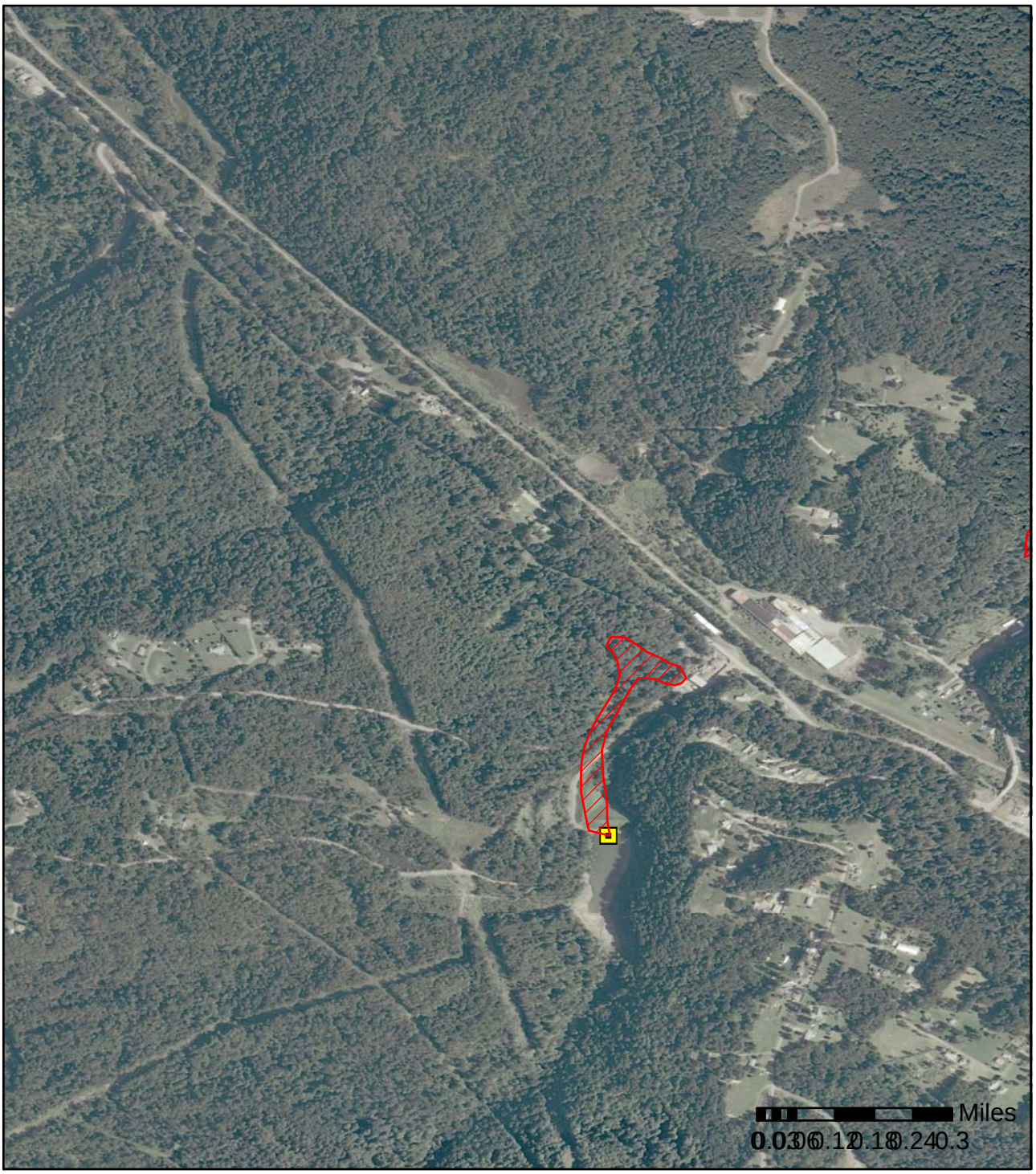


Vulnerability to Dam Failure

Tomlinson Run Dam Failure

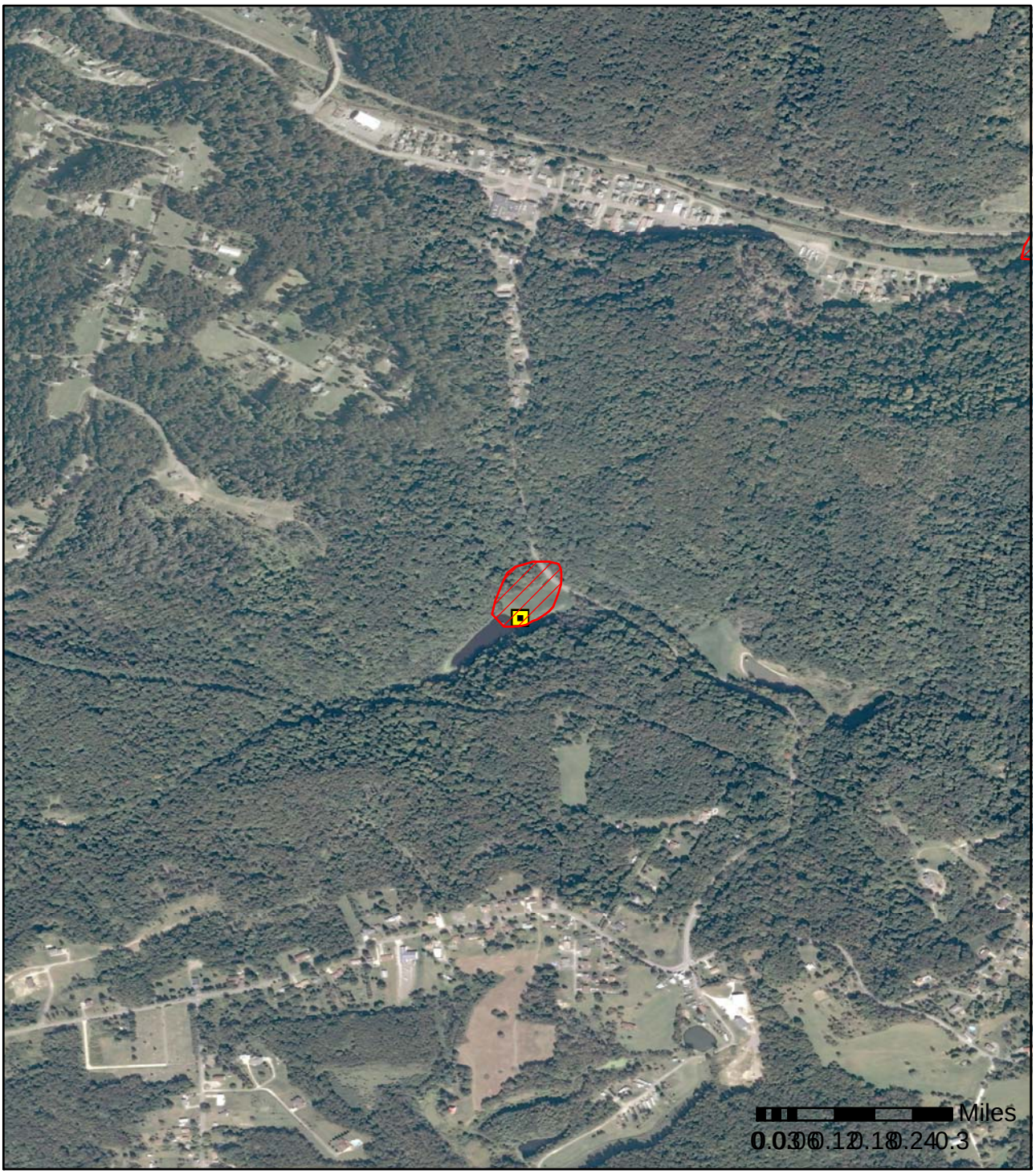
Vulnerability to Dam Failure

Harmon Creek Structure #1 Dam Failure



Vulnerability to Dam Failure

Harmon Creek Structure #2 Dam Failure

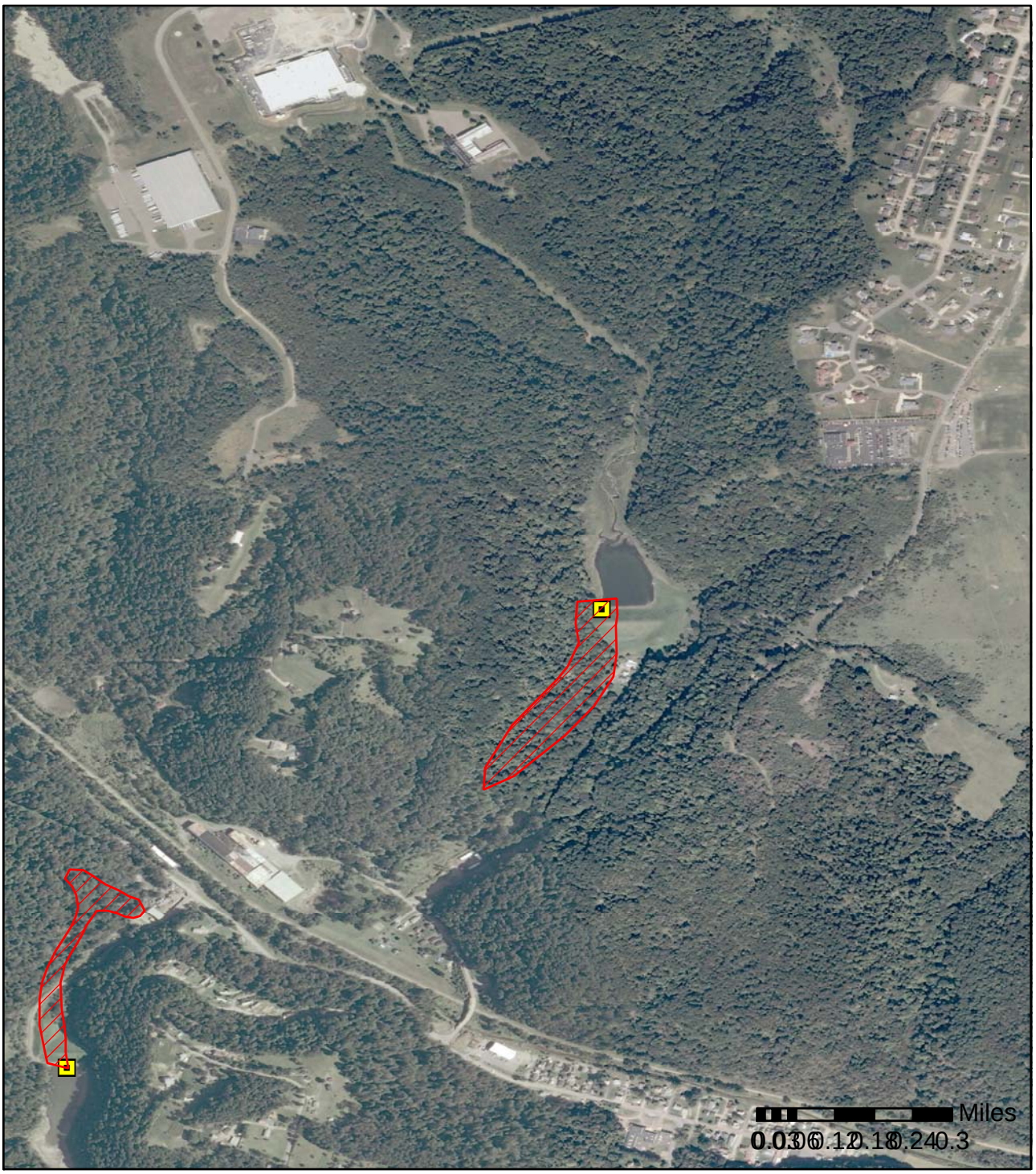


Vulnerability to Dam Failure

Harmon Creek Structure #4 Dam Failure

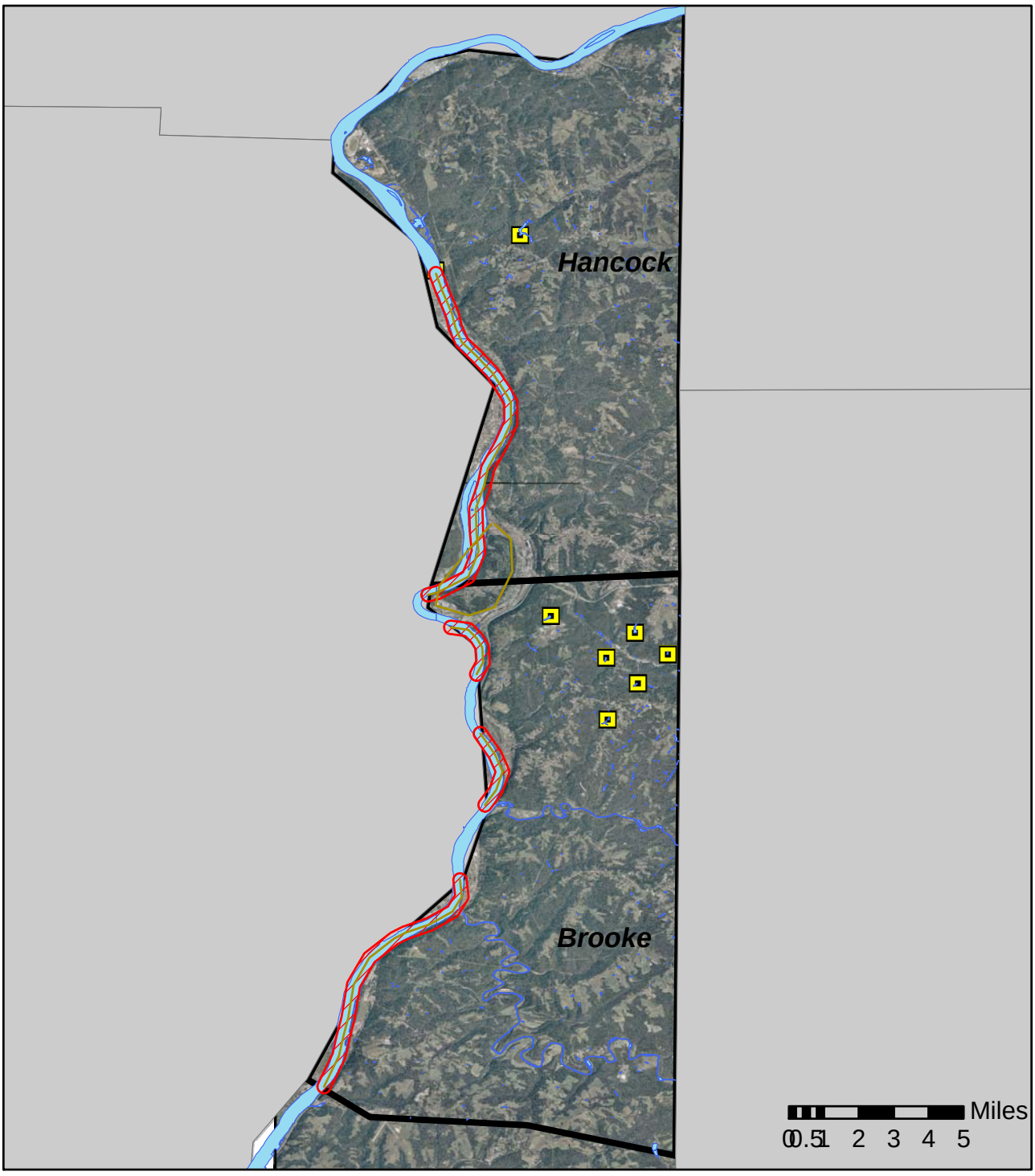
Vulnerability to Dam Failure

Harmon Creek Structure #13 Dam Failure



Vulnerability to Dam Failure

Harmon Creek Structure #14 Dam Failure



Vulnerability to Dam Failure

New Cumberland Locks & Dam Failure

2.2.3: Drought

Drought is an extended period of deficient rainfall relative to the statistical mean for a region.

RESEARCH SOURCES

- National Climatic Data Center (NCDC) Event Records

Period of Occurrence:	Summer months or extended periods with no precipitation
Number of Events to Date (1999–2011):	2
Probability of Event:	Infrequent – Small scale droughts occur frequently, but events causing major disruption and economic loss are infrequent
Warning Time:	Weeks
Potential Impacts:	Activities that rely heavily on high water usage may be impacted significantly, including agriculture, tourism, wildlife protection, municipal water usage, commerce, recreation, electric power generation, and water quality deterioration. Droughts can lead to economic losses such as unemployment, decreased land values, and agrobusiness losses. Minimal risk of damage or cracking to structural foundations, due to soils.
Cause Injury or Death:	None
Potential Facility Shutdown:	None

HAZARD EFFECTS

Droughts are defined according to meteorological, hydrological, and agricultural criteria. Any significant deficit of precipitation is categorized as meteorological. Hydrological drought is apparent in noticeably reduced river and stream flow and critically low groundwater tables. Agricultural drought indicates an extended dry period that results in crop stress and harvest reduction.

The Palmer Drought Severity Index (PDSI) is widely used throughout the United States as a measure of drought and to track moisture conditions. The PDSI is defined as “an interval of time, generally in months or years in duration, during which the actual moisture supply at a given place rather consistently falls short of the climatically expected or climatically appropriate moisture supply”. The range of the PDSI is from -

4.0 (extremely dry) to +4.0 (excessively wet), with the central half (-2.0 to +2.0) representing normal or near normal conditions.

HAZARD PROFILE

A drought could have a significant impact to the economy of the region, as all counties are home to agricultural activity. The following table summarizes the number of farms in each county (*Source: 2007 Census of Agriculture*) as well as the market value of crops sold. As can be seen from the table, agriculture's contribution to the local economy increased in both counties between the years of 2002 and 2007.

Agriculture in Region 11 Counties

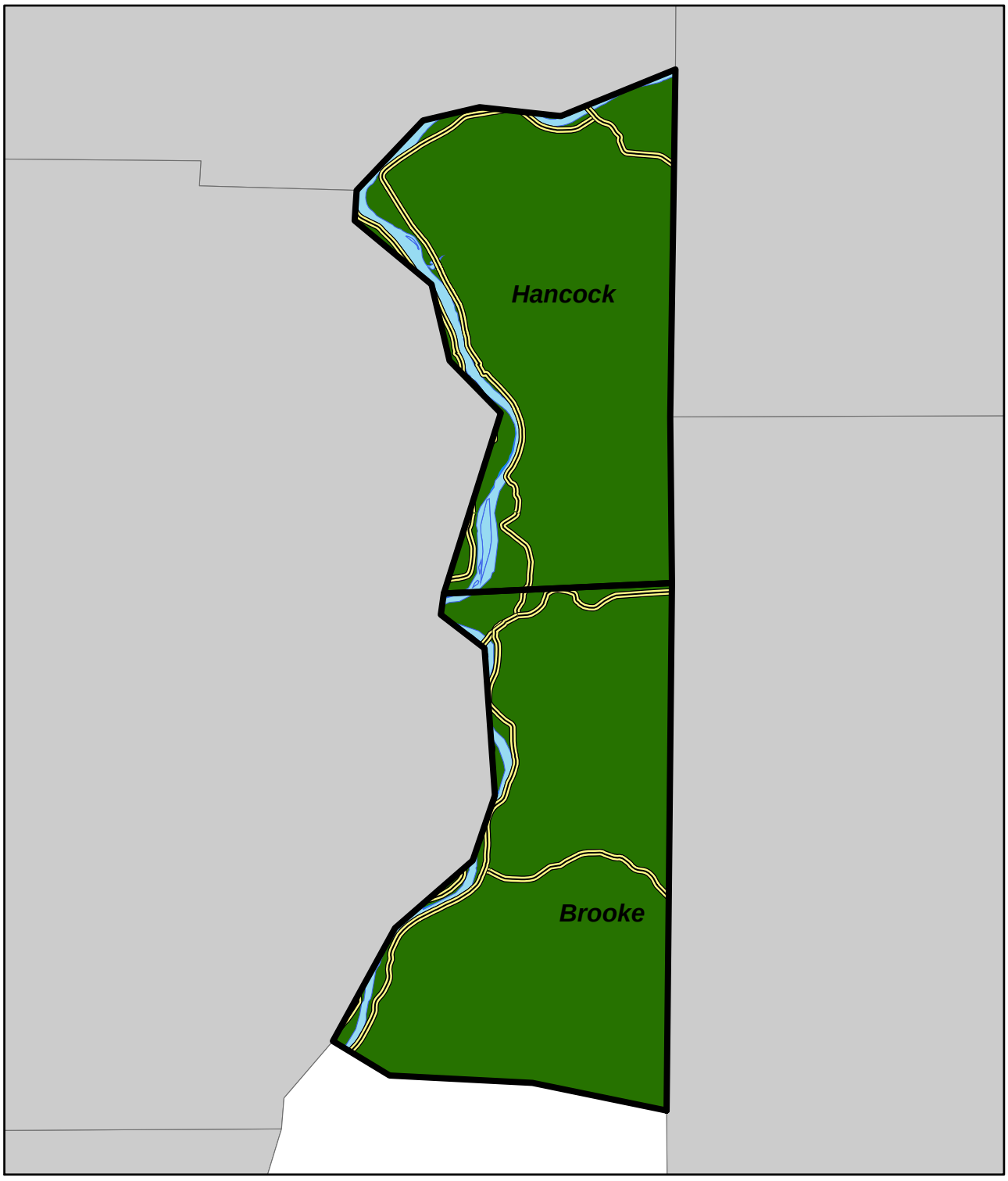
County	*Number of Farms*	*Market Value of Crops*	*Percent Change in Value from 2002*
Brooke	104	$985,000	+6
Hancock	109	$366,000	+28
TOTALS	**213**	**$1,351,000**	

As with many hazards, determining specific risk and vulnerability areas for drought is difficult. Drought is an "overall" hydrologic condition; that is, if one small area was without precipitation but a nearby area was not, it would be difficult to classify the entire area as "in a drought" due to the eventual seepage of said precipitation to the overall groundwater supply. Consequently, drought is said to affect the entire region evenly.

LOSS ESTIMATES

To show drought's impact on the region, though, the following chart depicts historical drought losses (*Source: NCDC Event Records*) as well as each county's estimate of Worst-Case Scenario (WCS) drought losses.

Historical Drought Occurrences and Losses				
County	*Number of Droughts*	*Total Drought Losses*	*Estimated Potential Losses*	
Brooke	2	N/A	$985,000	
Hancock	2	N/A	$366,000	
TOTALS	**2 (i.e., same event reported for both)**	**N/A**	**$1,351,000**	*As a note, estimated potential losses are based on the estimated annual market value of crops.*



Vulnerability to Drought

Low Hazard

2.2.4: Earthquake

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulation within or along the edge of the Earth's tectonic plates.

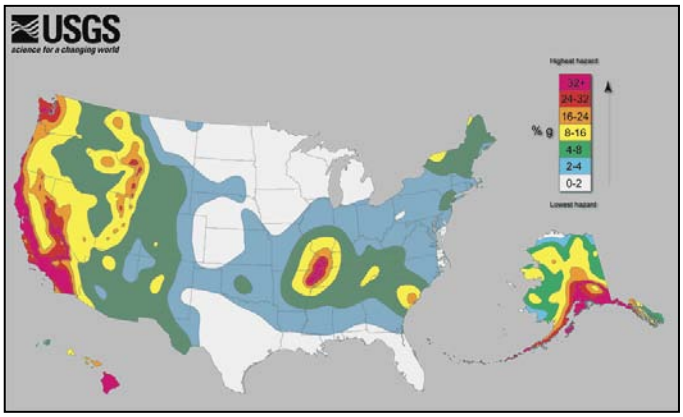
RESEARCH SOURCES

- US Geological Survey (USGS)
- Internet Research (http://www.earthquake.gov)

Period of Occurrence:	At any time
Number of Events to Date (1950 – 2011):	0 Epicenters
Probability of Event:	Infrequent
Warning Time:	None
Potential Impacts:	According to FEMA, areas with a PGA of 3 to 5 (0.03 to 0.05) will incur little to no damage with no function loss.
Cause Injury or Death:	Minor risk of injury
Potential Facility Shutdown:	None

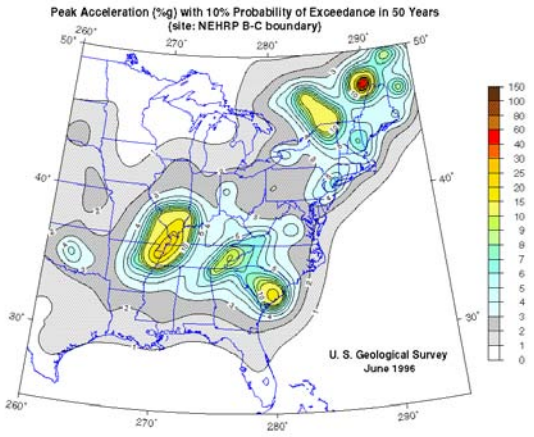
HAZARD EFFECTS

An earthquake's sudden release of stored energy may manifest itself by shaking or displacing the ground. The severity of these effects is dependent on the amount of energy released from the fault (or epicenter) of the quake. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure. Peak Ground Acceleration (PGA) is a measure of strength of ground movements. The PGA measures the rate in change of motion relative to the established rate of acceleration due to gravity.



HAZARD PROFILE

The map provided by the USGS (shown below) depicts the PGA values for areas with a 10% chance of being exceeded over the next 50 years. West Virginia does have an earthquake risk as it is located in the 2 and 3%g area. Both Brooke and Hancock Counties are located in areas with this PGA range. The Federal Emergency Management Agency (FEMA) states that areas with these PGAs are considered to have a low to moderate earthquake risk. As such, earthquake vulnerability is rated "low".

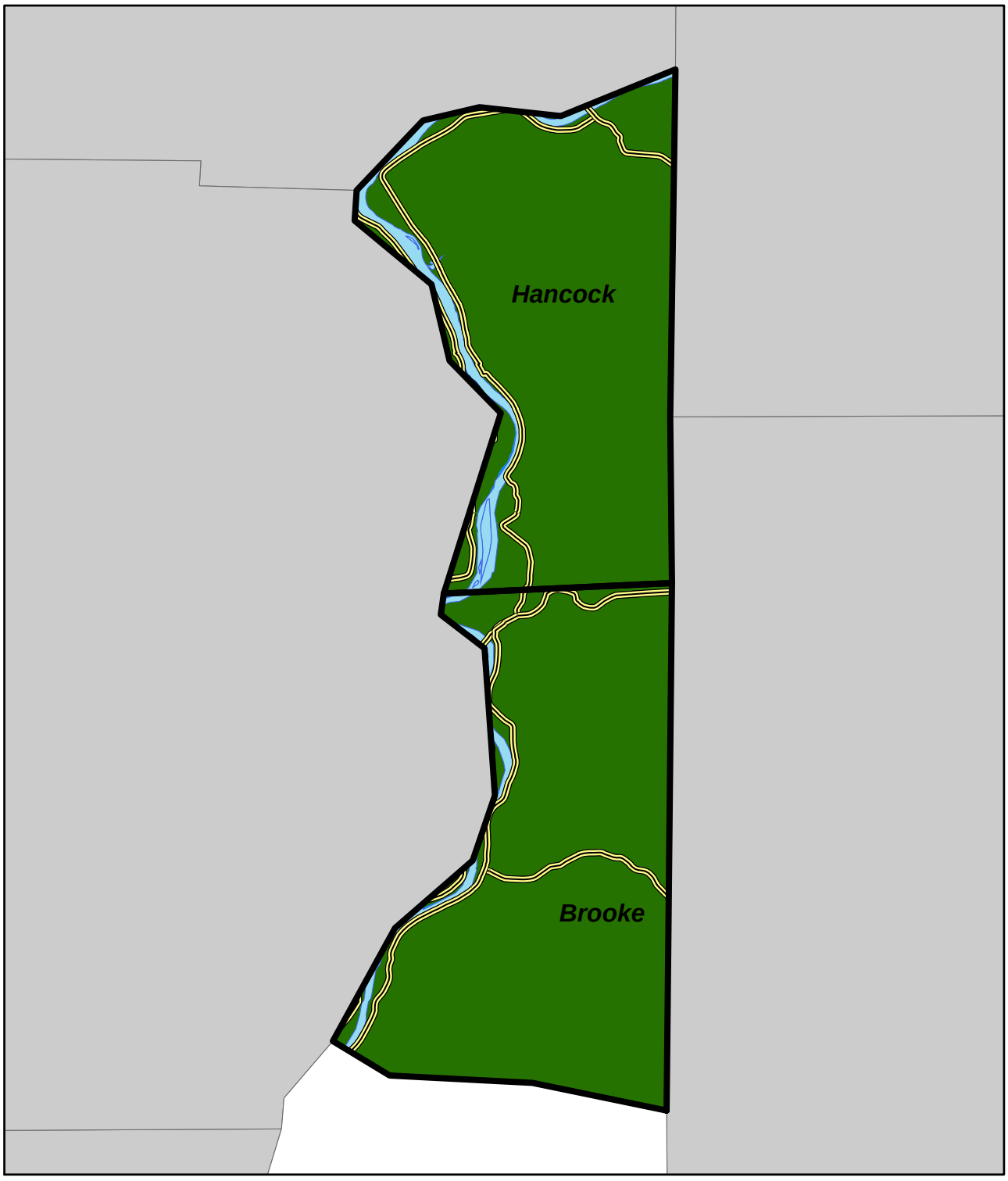


The Central and Southeast U.S. region covers a large area of relatively diffuse, low-rate seismicity. Principle areas of activity include the New Madrid Seismic Zone of the central Mississippi Valley and the Southern Appalachian Seismic Zone, extending from Virginia to Alabama. These areas of continued seismic activity increase the likelihood of West Virginia's counties experiencing or being affected by an earthquake at some point in time even though there is no historical evidence of an earthquake occurring in the past. This assumption recently proved true, as a small earthquake (magnitude 2.9) occurred in April, 2010, near the Town of Man in Logan County (southwest of the Northern Panhandle). A second small earthquake (magnitude 2.8) also occurred in April near Sutton in Braxton County, again south of the planning area.

The Northern Panhandle of West Virginia, of which Brooke and Hancock Counties are the northern-most counties, could also experience the effects of an earthquake from the northeastern portions of Ohio and "under" Lake Erie. The Ohio Seismic Network has reported a number of epicenters in the eastern portions of Ohio. (*NOTE: A map of these quakes can be accessed at http://www.dnr.state.oh.us/geosurvey/apps/IMSapps/.) In 2010, an earthquake in the northeastern portion of Ohio was felt in northern West Virginia, with noticeable shaking in Wheeling (just south of the planning area).

LOSS ESTIMATES

The somewhat random historical occurrences of earthquakes would indicate that all structures throughout both counties to be equally at risk from earthquakes. The severity of those earthquakes, though, is expected to be very low (according to FEMA's 386-2 document). Given this low severity, officials in all both counties estimated earthquake losses to be zero.



Vulnerability to Earthquake

Low Hazard

2.2.5: Flooding

Flooding is defined as a general temporary condition of partial or complete inundation of normally dry land areas from: overflow of inland or tidal waters; unusual and rapid accumulation of runoff of surface water from any source; mudflows; or the sudden collapse of shoreline land. A flash flood is a rapid flooding of low-lying areas, rivers, and streams that is caused by intense rainfall and is often associated with thunderstorms.

RESEARCH SOURCES

- NCDC Event Records
- Interviews with Local Officials

Period of Occurrence:	Ohio River – Primarily January through May (history shows incidents occurring year-round) Flash Flood – At any time depending on recent weather conditions Result of Dam Failure – At any time
Number of Events to Date (1985 – 2011):	56
Probability of Event:	Frequent
Warning Time:	River Flood – 3 to 5 days Flash Flood – Minutes to hours Dam Failure – None
Potential Impacts:	Impacts to human life, health, and public safety. Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, fire, damaged or destroyed critical facilities, and hazardous material releases. Can lead to economic losses such as unemployment, decreased land values, and agrobusiness losses. Floodwaters are a public safety issue due to contaminants and pollutants.
Cause Injury or Death:	Injury and moderate risk of death
Potential Facility Shutdown:	Days to Weeks

HAZARD EFFECTS

Flooding is arguably the highest priority hazard in both counties (as is the case in most of West Virginia). The counties are susceptible to flooding largely due to physical geography, which includes several rivers and creeks as well as varied topography. The worst floods usually occur when a river overflows its banks. Periodic floods occur naturally on most rivers, forming an area known as a "floodplain". With enough rainfall,

the rivers and creeks will rise up to and over the floodplain, thus causing a flood.

Flash flooding is also a common concern throughout the region. Historical occurrences can indicate where flash flooding will strike, but it is somewhat more unpredictable than riverine flooding. Flash flooding can be a result of an overloaded storm water management system, a washed out creek bed, water rushing off of a hill or mountain, etc. In some cases, flash floods result in great damage because areas that are not in identified floodplains (and are thus not prepared for potential flooding) are affected. The most frequent areas of reported flash flooding in the area are from run-off in Wellsburg (Brooke County) and along State Route (SR) 2 near New Cumberland in Hancock County.

An oft-overlooked element of the flooding hazard is the public health risk it creates. According to the World Health Organization (WHO), flooding is associated with an increased risk of infection *if water sources are compromised or significant population displacement is forced*. Contamination of drinking water facilities also often results in disease outbreaks. Direct contact with polluted waters (i.e., emergency services personnel, residents swimming in flood waters, residents driving/walking through floodwaters, etc.) can also cause water-borne diseases. Flooding may lead to vector-borne diseases if water is left standing for long periods of time. As such, local planners should be aware of the ancillary, cascading effects of flooding.

DESCRIPTION OF EXISTING FLOOD HAZARD AND IDENTIFICATION OF FLOOD RISK

Both counties have an extensive history of flooding. The table below lists the number of flooding events faced in the counties since 1985 as well as the reported damage and any injury/death information.

Historical Flood Events in Region 11

County	*Number of Events*	*Reported Damage*	*Injuries*	*Deaths*
Brooke	34	$28,917,000	0	0
Hancock	22	$43,895,000	0	0
TOTALS	**56**	**$72.812,000**	**0**	**0**

Flooding has occurred recently and frequently since the original adoption of Brooke and Hancock Counties' hazard mitigation plans. In the City of Wellsburg, 12

homes, two (2) businesses, and one (1) church were affected by flooding in early 2011. Additional, flooding occurred in 2004 and 2005. Areas likely to continue to flood include the areas "below" (i.e., west) of State Route 2 in Wellsburg, Beech Bottom, and Follansbee. In Wellsburg, planning committee members noted that a number of residences and businesses are located in the 100-year floodplain in the western edges of town, which correspond to those between SR 2 and the Ohio River. These areas include the county courthouse. Some small areas in the northern portions of Chester may continue to flood near Louella Avenue. Areas repetitively flooded in Bethany will also likely to continue flooding (though many of these areas are green space, athletic fields, etc.). Due to mitigation efforts in and near traditional floodplain areas, flooding is unlikely to get worse in any of these areas. The majority of the Ergon West Virginia site in northern Hancock County is located in the floodplain; the plant has planned for a flooding response, according to its officials. Much of lower New Cumberland could flood per the 100-year floodplain, including the town's fire department, water plant, and much of its business district. Most generally, buyout projects are considered when available; however, due to the topography, widespread relocation of these facilities is not feasible.

To better profile the type of impact flooding events could have on the region, Hazus reports were generated for 10-year, 25-year, and 50-year flood events in each of the region's counties. (*NOTE: The full Hazus reports are included in Appendix 1.)

10-Year Flood Event

This type of flood event has a 10% chance of occurring in any single year (*Source: Wikipedia*). The following impacts, listed by county, are anticipated.

- Brooke County
  - An estimated 683 buildings would have moderate damage (representing over 7% of the total number of buildings in the risk area).
  - An estimated 412 buildings would be completely destroyed.
  - Of the county's critical facilities, an estimated one (1) fire station, three (3) police stations, and two (2) schools could see substantial damage and another one (1) fire station could see moderate damage.
  - An estimated 100,043 tons of debris would be generated.
  - As many as 850 households could be displaced, which could result in approximately 1,811 people needing shelter.

- The total building-related loss could exceed $281,820,000. Approximately 1% of this loss would be related to business interruption. Residential losses comprise over 45% of the estimate.

- Hancock County
  - An estimated 431 buildings would have moderate damage (representing over 18% of the total number of buildings in the risk area).
  - An estimated 192 buildings would be completely destroyed.
  - Of the county's critical facilities, an estimated one (1) police station could see substantial damage and another one (1) police station and one (1) school could see moderate damage.
  - An estimated 33,578 tons of debris would be generated.
  - As many as 635 households could be displaced, which could result in approximately 1,267 people needing shelter.
  - The total building-related loss could exceed $154,880,000. Approximately 1% of this loss would be related to business interruption. Residential losses comprise over 51% of the estimate.

25-Year Flood Event

Twenty-five (25)-year floods have a 4% chance of occurring in any single year. The following impacts, listed by county, are anticipated.

- Brooke County
  - An estimated 750 buildings would have moderate damage (representing over 7% of the total number of buildings in the risk area).
  - An estimated 528 buildings would be completely destroyed.
  - Of the county's critical facilities, an estimated one (1) fire station, three (3) police stations, and two (2) schools could see substantial damage and another one (1) school could see moderate damage.
  - An estimated 109,360 tons of debris would be generated.
  - As many as 64909 households could be displaced, which could result in approximately 1,930 people needing shelter.
  - The total building-related loss could exceed $305,300,000. Approximately 1% of this loss would be related to business interruption. Residential losses comprise over 46% of the estimate.

- Hancock County
  - An estimated 578 buildings would have moderate damage (representing over 16% of the total number of buildings in the risk area).
  - An estimated 235 buildings would be completely destroyed.
  - Of the county's critical facilities, an estimated one (1) police station could see substantial damage and another one (1) each fire station, police station and school could see moderate damage.
  - An estimated 43,965 tons of debris would be generated.
  - As many as 746 households could be displaced, which could result in approximately 1,511 people needing shelter.
  - The total building-related loss could exceed $194,740,000. Approximately 1% of this loss would be related to business interruption. Residential losses comprise over 53% of the estimate.

50-Year Flood Event

These types of events have a 2% chance of occurring in any single year. The following impacts, listed by county, are anticipated.

- **Brooke County:** The Hazus report is included in Appendix 1; however, data appears to be incorrect in comparison to the above estimates.
- Hancock County
  - An estimated 641 buildings would have moderate damage (representing over 12% of the total number of buildings in the risk area).
  - An estimated 258 buildings would be completely destroyed.
  - Of the county's critical facilities, an estimated one (1) police station could see substantial damage and another one (1) each fire station, police station and school could see moderate damage.
  - An estimated 50,659 tons of debris would be generated.
  - As many as 779 households could be displaced, which could result in approximately 1,580 people needing shelter. Losses could be as much as $216,540,000. Approximately 1% of this loss would be related to business interruption. Residential losses comprise over 52% of the estimate.

Hazus reports were also compiled for the 100-year flood event, which is a flood event with a 1% chance of being equaled or exceeded in any single year (*Source: Wikipedia*). If an event, though, were to be classified as a 100-year flood in any county, it is likely that the event itself would be regional and affect, at least minimally, other nearby counties. As such, the 100-year event is analyzed regionally by this profile. The following estimates apply to a 100-year flood.

- Buildings with Moderate Damage: 1,555
- Buildings Completely Destroyed: 940
- Critical Facilities Affected
  - **Fire Stations:** 2
  - **Hospitals:** 0
  - **Police Stations:** 5
  - **Schools:** 4

- Debris Generated: 176,691
- Economic Losses: $575,720,000
  - **Brooke County:** $342,030,000
  - **Hancock County:** $233,690,000

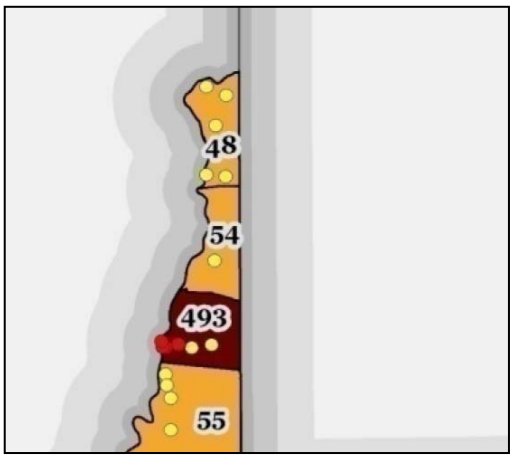
- Building-Related Losses: $566,120,000
  - **Brooke County:** $336,680,000
  - **Hancock County:** $229,440,000

REPETITVE LOSS PROPERTIES

Several communities see repeated flooding problems. Some even contain a number of properties that have been flooded and repaired multiple times. These properties are referred to as “Repetitive Loss” (RL) properties. Actual RL listings are protected by privacy laws because of the presence of names, addresses, losses, etc. These properties, though, can be depicted in this document by type (i.e., single family, 2-4 family, etc.). To better illustrate areas with repeated flooding problems, the *general* areas where these properties are located is also listed.

- **Brooke County:** 2 single family properties
- **Hancock County:** 16 single family properties
- **New Cumberland:** 16 total properties (13 single family, 3 non-resident)

- **Weirton:** 17 single family properties
- **Wellsburg:** 52 total properties (11 non-resident, 5 two-four family, 1 assmd condo, 35 single family)



The repetitive loss projects are spread out across the region and are not confined to a single watershed. Most of the repetitive losses in Brooke County, though, are within the Upper Ohio-Wheeling Watershed while the repetitive loss properties in Hancock County are in the Upper Ohio Watershed.

A number of mitigation projects have been undertaken to lessen the number of RL properties. These include the King Creek Mitigation Project" and a current project in Wellsburg (for which ten [10] applications have been received). The Kings Creek project is located within the Upper Ohio Watershed.

NFIP COMPLIANCE

The following local governments in Brooke and Hancock Counties are participants in the National Flood Insurance Program (NFIP). (The date the jurisdiction joined the NFIP is included in parentheses.)

- Village of Beech Bottom (April, 2011)
- Town of Bethany (September, 1979)
- Brooke County (December, 1983)
- City of Chester (December, 1982)
- City of Follansbee (September, 1982)
- Hancock County (June, 1984)
- City of New Cumberland (May, 1980)
- City of Weirton (September, 1979)
- Cit of Wellsburg (November, 1982)

Each jurisdiction participating in the NFIP has designated an "NFIP Coordinator", sometimes referred to as the "Floodplain Manager". This individual maintains the jurisdiction's floodplain ordinance and ensures that development is compliant with that ordinance (and, consequently, the NFIP). The operations of the floodplain offices in Brooke and Hancock Counties are similar from jurisdiction to jurisdiction (*Source:* Interviews with floodplain managers). Generally, all provide three (3) basic services: floodplain identification, floodplain management, and outreach.

Local floodplain coordinators confirm that their responsibilities include identifying where it could flood. These individuals also serve as Points of Contact (POCs) with FEMA regarding floodplain mapping. As an example, local coordinators were heavily involved with the recent map modernization project. Also, in Brooke County, the floodplain coordinator works with the assessor, particularly when residents apply for building permits for areas in the floodplain. Under such a circumstance, the floodplain coordinator visits the site and works with the owner to develop ways to meet the floodplain ordinance with the new construction. All new construction must meet the floodplain ordinance.

Floodplain coordinators also serve as POCs for their community regarding general floodplain management. For example, residents contact the floodplain offices with questions on flood maps (e.g., property determinations) as well as paperwork requirements for insurance and the like. The floodplain coordinators work closely with their governing bodies on the development, revision, and enforcement of the local floodplain ordinance. For example, in Wellsburg, the floodplain coordinator and city council went through a difficult process of adopting the standard "state" floodplain ordinance because of the layout of the city (i.e., the western "half" of the city is in the floodplain) and the need to *not* limit development opportunities within the corporate limits.

Finally, local floodplain coordinators organize public outreach efforts as in many other parts of the state. For example, Hancock County's floodplain coordinator facilitates group meetings around Hancock County to let residents know of the areas that flood, to provide general information on flood insurance, etc.

VULNERABLE STRUCTURES

Vulnerable Structures – Flooding								
County	*Residential*	*Commercial*	*Industrial*	*Agricultural*	*Religious*	*Government*	*Education*	*Utilities*
Brooke	570	100	25	10	11	5	5	15
Hancock	338	58	13	4	4	2	2	6
TOTALS	**908**	**158**	**38**	**14**	**15**	**7**	**7**	**21**

The following facilities, all listed on the region's "asset inventory", are located in the Special Flood Hazard Area (SFHA) (i.e., 100-year floodplain). This information was provided by the floodplain coordinators in each county. It does not list *every* facility in the region that is located in the SFHA, just those that are considered community assets.

- Brooke County
  - Beech Bottom Water System Pump House
  - Brooke County Courthouse
  - Brooke County PSD Sewer Treatment Plant
  - Brooke County Public Library
  - Brooke County Sheriff's Department
  - Brownly Property
  - Castleman Run Church
  - Castleman Run Dam
  - City of Wellsburg Municipal Building
  - Collier Primary School
  - Colliers Fire Department
  - First Presbyterian Church, Wellsburg
  - Henderson Chapel
  - McKinleyville VFD
  - Reorganized Church of Jesus Christ of Latter Day Saints
  - St. John the Evangelist Catholic Church
  - St. Johns School
  - Short Creek VFD
  - Stillson's Mobile Home Court
  - Stone Chapel Church
  - Bethany Municipal Building
  - Wellsburg Christian Church
  - Wellsburg Detachment, WVSP
  - Wellsburg Middle School
  - Wellsburg Police Department
  - Wellsburg Primary School
  - Wellsburg United Methodist Church
  - Wellsburg VFD

- Hancock County
  - Arcelor Mittal Weirton
  - Chester Sewage Treatment Plant
  - CM Tech
  - Crescent Brick
  - First National Bank Graham Building
  - New Cumberland Volunteer Fire Department
  - New Cumberland Water Treatment Plant
  - Peter Tarr Furnace Site
  - Saint Paul School
  - Weirton City Fire

LOSS ESTIMATES: See Hazus information above.

*NOTE: Detailed flood mapping for each county is maintained by each jurisdiction in the planning area. Identification of floodplain areas on those maps is based on Flood Insurance Rate Map (FIRM) data (D-FIRM, if available) produced by the National Flood Insurance Program NFIP. Additional resources, such as the West Virginia Flood Hazard Determination Tool (http://www.mapwv.gov/flood/) can also be used. See the regional flood map that is appended to this document for a general, graphic depiction of flood risk in the planning area.

Vulnerability to Flooding

100 Year Flood Plain

2.2.6: Hailstorm

Hail is a form of precipitation which occurs when freezing water in thunderstorm type clouds accumulates in layers around an icy core. When this event takes place, balls or irregular lumps of ice are created. On average, hail can be from 5mm to 50mm in diameter.

RESEARCH SOURCES

- NCDC Event Records

Period of Occurrence:	At any time
Number of Events to Date (1982 – 2011):	31
Probability of Event:	Likely – Usually associated with severe thunderstorms
Warning Time:	Minutes to hours
Potential Impacts:	Large hail can minimally damage property (facilities) as well as crops
Cause Injury or Death:	Injury
Potential Facility Shutdown:	Minimal

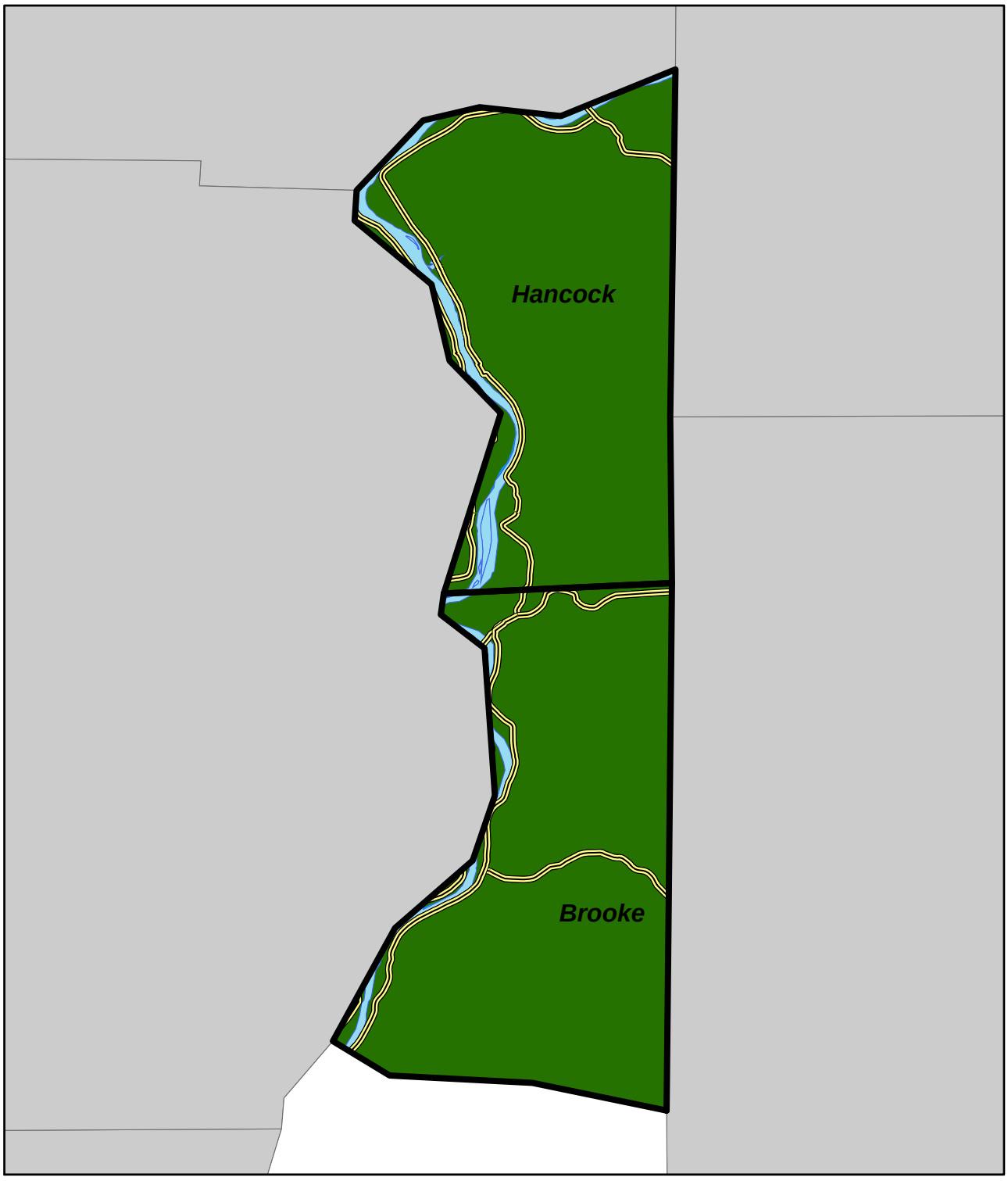
HAZARD EFFECTS

When hail occurs, it can cause damage by battering crops, structures, automobiles, and transportation systems. When hailstorms are large, especially when combined with high winds, damage can be somewhat extensive. Hailstorms are more common in elevated areas, such as the mountains, than tropical areas since locations such as mountains are closer to the bottom of thunderstorms. In mountainous areas, the falling hail has less time to melt before touching the ground. Brooke and Hancock Counties both have a history of hailstorms.

Hail is a relatively minor natural hazard in all parts of the region. It has been included in this plan by virtue of the frequent occurrences. All parts of the region are affected equally. Even with these frequent occurrences, losses are small, especially to critical facilities and other infrastructure. Much like minor thunderstorms, hailstorms rarely slow down the daily lives of the residents. If their vehicles or homes are damaged, they usually claim those damages on their insurance policies or repair the damage themselves.

LOSS ESTIMATES

As a minor hazard, potential losses as a result of hail are small, even though all structures in the region can be said to be at risk of hail damage. If the entire region were affected by a WCS event, losses could total as much as $29,044,431. *NOTE: Loss estimates are listed at these levels because of the confusion usually results in damage from hailstorms (as directly from hail or as part of the thunderstorm producing hail).



Vulnerability to Hail Storm

Low Hazard

2.2.7: Hazardous Material Incident

A technological hazard refers to the origins of incidents that can arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials.

RESEARCH SOURCES

- Brooke County Tier II Filings
- Hancock County Tier II Filings
- *Brooke Co. Commodity Flow Study* (CFS), 1995
- *Hancock County CFS, 2008*
- *Hancock County Vulnerability Assessment*, 2009
- Interviews with Local Officials

Period of Occurrence:	At any time
Number of Events to Date (2000–2011):	4
Probability of Event:	Infrequent
Warning Time:	None
Potential Impacts:	Potential loss of human life, economic loss, environmental damage
Cause Injury or Death:	Injury and risk of multiple deaths
Potential Facility Shutdown:	Days to weeks

HAZARD EFFECTS

The manufacture, storage, transportation, and use of hazardous materials can become a hazard if an accident occurs. Hazardous material incidents typically happen in one (1) of two (2) ways: fixed facility releases and transportation accidents. The major difference between the two is that it is reasonably possible to identify and prepare for a fixed facility incident because laws require those facilities to notify state and local authorities of what materials are being used, stored, and/or produced at that facility.

Transportation incidents are substantially more difficult for which to prepare, however, because it is difficult to determine what material(s) could be involved until the accident actually happens. Information is routinely compiled on the locations of facilities that store hazardous materials. Further, the US Department of Transportation (USDOT) estimates that the vast majority of hazardous material incidents occur during the

transport phase.

HAZARD PROFILE

Both counties contain "covered facilities" that report the use and/or storage of hazardous materials to the appropriate county Local Emergency Planning Committee (LEPC). The following are approximate facility counts for each county (*Source: Local LEPCs*):

- **Brooke:** 25
- **Hancock:** 35

It could be easy to predict the location of fixed facility hazardous material incidents. The probability of such occurrences, though, is relatively low. Should an event occur, many facilities have internal response protocols to contain the incident.

Hancock County recently completed an update to its commodity flow study to analyze the transport of materials, primarily along highways, through its jurisdiction. Brooke and Hancock Counties are traversed by three (3) thoroughfares – State Route (SR) 2, US Route 22, and US Route 30. In Hancock County, SR 2 and US 22 were observed. (*NOTE: Portions of US 22 in the study area were actually located in Brooke County.) Materials were recorded from the following hazard classes: flammable/non-flammable gases, flammable liquids, flammable solids, corrosives, and miscellaneous materials.

Elevated temperature liquids, argon, and environmentally hazardous substances were reported as transported via railway. Further, a number of materials – including ammonia, benzene, toluene, and sulfuric acid – were reported as transported via waterway. In total, the study showed that 222 specifically-named materials were transported through Hancock and parts of Brooke Counties.

In addition, the transport of hazardous materials for other industrial operations has captured the attention of many leaders and residents throughout the region. A number of chemicals, including hydrochloric acid, liquid nitrogen, etc. are transported throughout the area as a part of natural gas fracturing operations. Given the flurry of activity, information sharing with companies is occurring, but is often perceived to be slower than the pace of drilling and fracking operations. Additionally, operations may be located in very rural parts of the region, thereby increasing the risk for a transportation-based incident due to road conditions and topography.

The map below depicts high and moderate risk areas for transportation hazardous material incidents throughout the region. It should be noted that SR 2, US Route 22, and US 30 would likely be the primary routes of hazmat transport (as evidenced by the relevant commodity flow studies). As such, these three (3) corridors are listed as highly vulnerable, as is the area along the Ohio River, which is the site of the majority of industrial activity in the region. Buffers to these high-hazard areas are also assumed (and listed as "moderate" hazard).

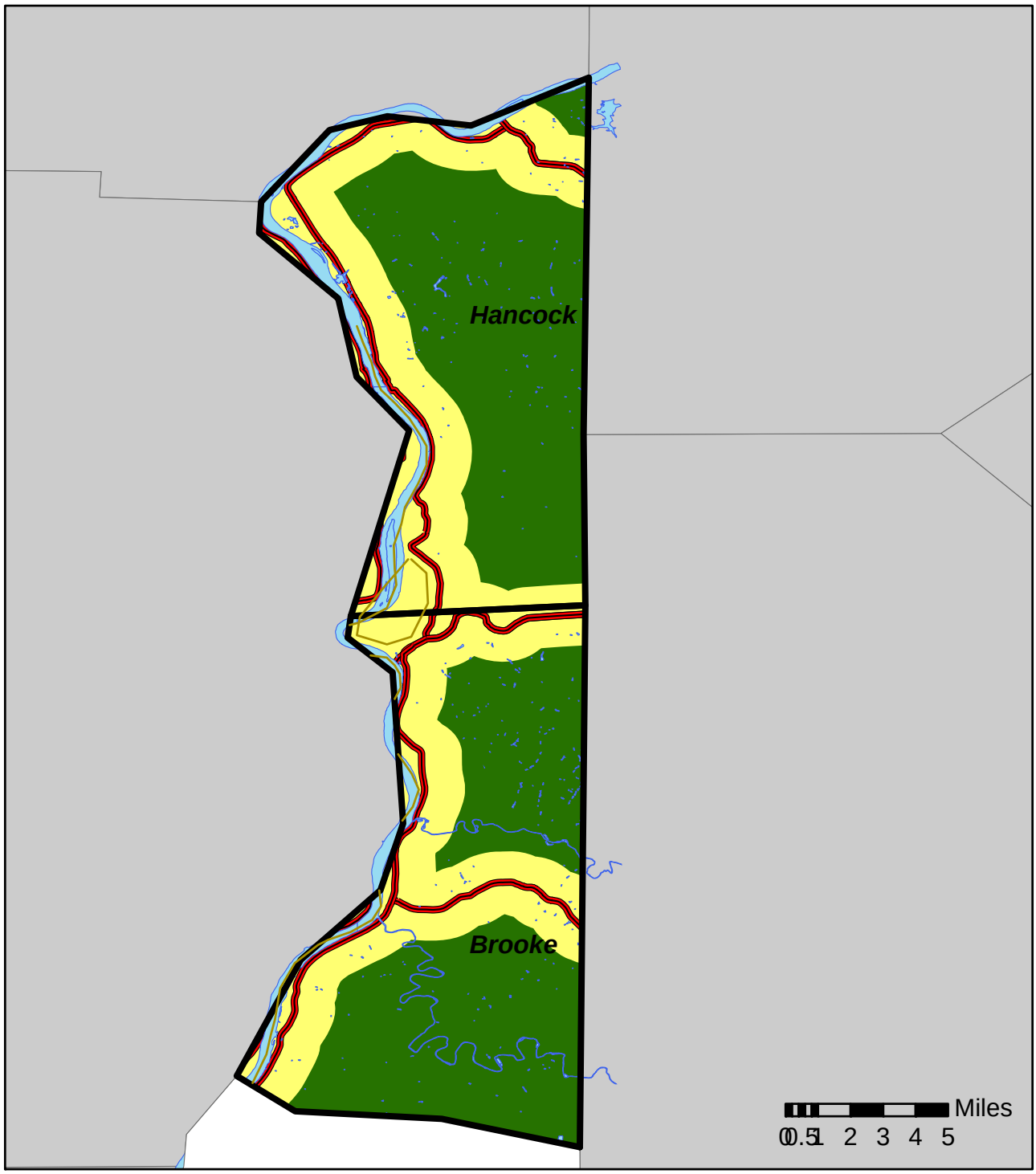
VULNERABLE STRUCTURES

Vulnerable Structures – Hazardous Material Incident								
County	*Residential*	*Commercial*	*Industrial*	*Agricultural*	*Religious*	*Government*	*Education*	*Utilities*
Brooke	3,300	100	60	50	17	2	11	22
Hancock	4,400	400	90	80	20	8	9	9
TOTALS	**7,700**	**500**	**150**	**130**	**37**	**10**	**20**	**31**

LOSS ESTIMATES

In an effort to assist jurisdictional understanding of risks and implementation of strategies, such estimates were done for each county; the following table reflects those efforts. These are WCS estimates and were organized by county because hazardous material incidents are site-specific hazards.

Estimated Hazardous Material Losses	
County	*Loss Estimate*
Brooke	$525,003,420
Hancock	$624,998,930
TOTALS	**$1,150,002,350**



Vulnerability to Hazardous Materials

- High Hazard
- Moderate Hazard
- Low Hazard

2.2.8: Land Subsidence

Land subsidence refers to any failures in the ground that cause collapses in the earth's surface.

RESEARCH SOURCES

- Interviews with Local Officials
- Internet Research (http://www.nationalatlas.gov)

Period of Occurrence:	At any time – Chance of occurrence increases following long periods of heavy rain, snowmelt, or near construction activity
Number of Events to Date (2000 – 2011):	2
Probability of Event:	Infrequent
Warning Time:	Weeks to months – Some instances of land subsidence can occur quickly without warning, but often in the context of other storm events.
Potential Impacts:	Economic losses such as decreased land values, agrobusiness losses, disruption of utility and transportation systems, and costs for any litigation. May cause geological movement, causing infrastructure damages ranging from minimal to severe.
Cause Injury or Death:	Injury
Potential Facility Shutdown:	Days to weeks

HAZARD EFFECTS

Land subsidence hazards include: landslides (a wide range of earth movement such as rock falls), debris flow (e.g., mudslides and avalanches), and expansive soils (which is the swelling and sinking of soil). Each of these hazards involves ground movement in or on the earth's surface. These hazards can be caused by natural processes such as the dissolving of limestone underground, earthquakes, or volcanic activity. Land subsidence hazards can also occur as a result of human actions such as the withdrawal of subsurface fluids or underground mining; unplanned commercial, residential or industrial developments; roadway construction; etc.

HAZARD PROFILE

Both counties lie on a geological formation containing evaporate rock such as salt and gypsum (The map below demonstrates the presence of "evaporite rocks" in West Virginia and roughly throughout the Northern Panhandle.) As a result, the entire region appears susceptible to subsidence, but it should be noted that the type of subsidence could vary. According to nationalatlas.gov, sink holes and other subsidence are not predicted to be extensive in the areas of West Virginia containing these formations. The map below illustrates the areas corresponding to these different types of subsidence.

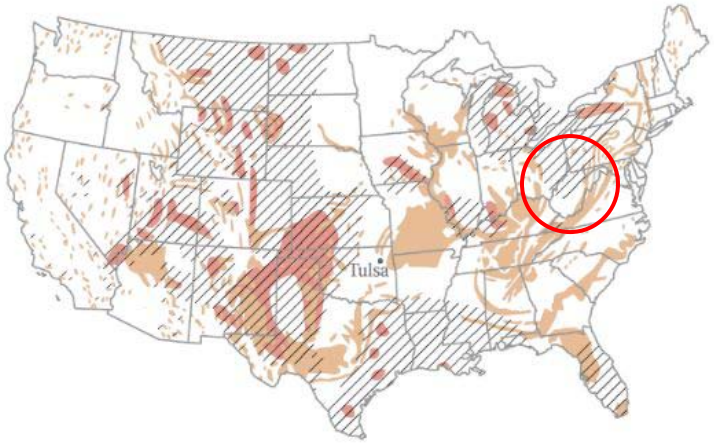
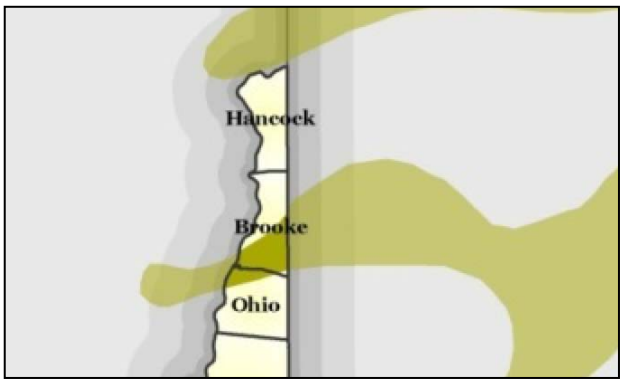


Figure 9. Salt and gypsum underlie about 40 percent of the contiguous United States. Carbonate karst landscapes constitute about 40 percent of the United States east of Tulsa, Oklahoma (White and others, 1995).

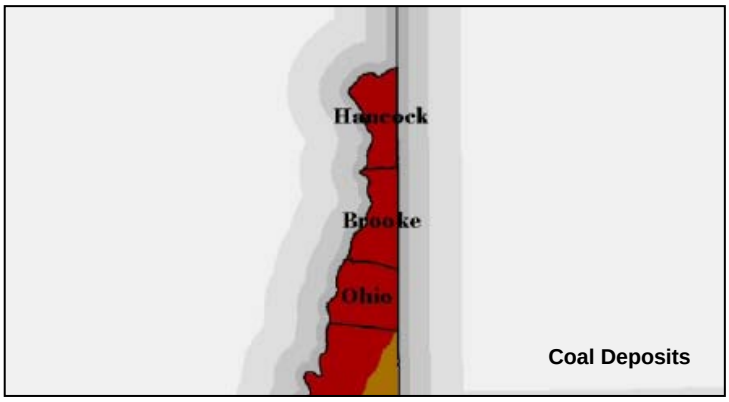
Evaporite rocks—salt and gypsum
Karst from evaporite rock
Karst from carbonate rock
(modified from Davies and Legrand, 1972

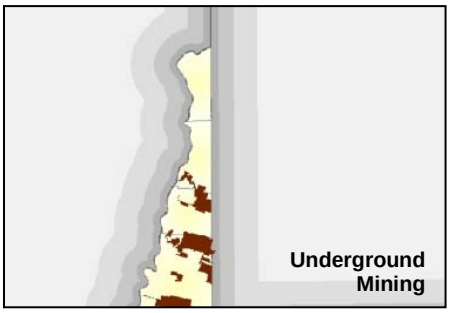
The *West Virginia State Standard All-Hazard Mitigation Plan* discusses karst formations throughout West Virginia. According to that document, Brooke County contains areas of "short karst". The image at right depicts these areas. The light green sections in Brooke County depict short karst in gently-dipping to flat-lying beds of carbonate rock. As can be seen, the karst areas to the north of Hancock County appear to stop at the Ohio River.

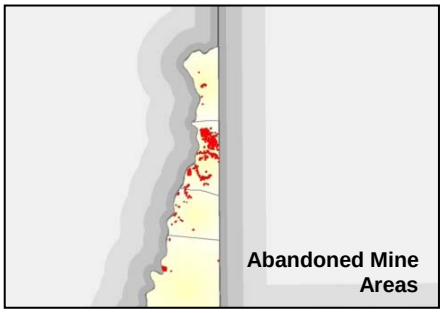


Mining is also present in the region. Both counties contain deposits of medium and high-volatile bituminous coal. There are underground mines present in southern Brooke County. Further, there are a number of abandoned mines in both counties (especially in central and northern Brooke County). The sites could spur land subsidence.

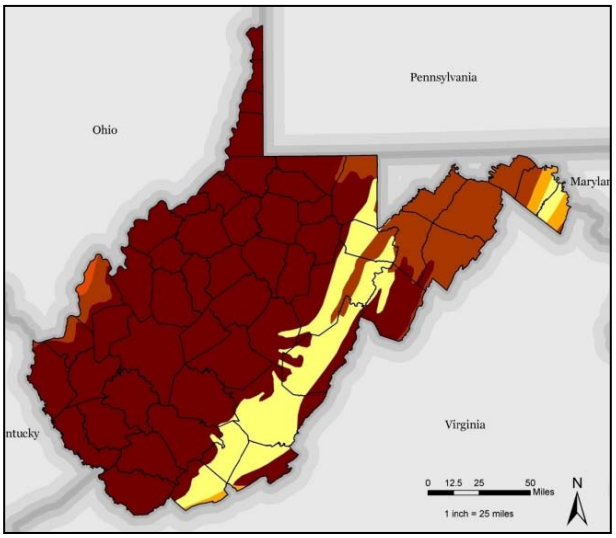
The images below graphically depict mining in Brooke and Hancock Counties. The red areas in the larger image show the bituminous coal deposits. The brown areas in the underground mine map show where in southern Brooke County underground mines can be found. Finally, the red areas in the abandoned mine map depict those areas where mines formerly operated.







The *West Virginia Enhanced State Mitigation Plan* considers the above data and supports the statement that the entire region is susceptible to subsidence. The state plan, as evidenced at right, indicates that all of both Brooke and Hancock Counties are considered to be "high incidence" areas.



In most cases, land subsidence has been frequently reported along the western edges of the counties, along the Ohio River. Wellsburg, for instance, has experienced land subsidence that has limited access into and out of the city. Areas along SR 2 throughout the counties have

also been affected by site-specific instances of land subsidence. Local officials indicate that the majority of land subsidence losses have been sustained by the region's transportation infrastructure.

Construction and other development projects have also been caused and/or been susceptible to the subsidence risk. For example, the region's infrastructure projects are listed above as "vulnerable" to land subsidence because of the construction (i.e., earth-moving) efforts needed to finish them. Further, development such as the increase in oil/gas exploration activities has been reported to cause minor subsidence issues. As an example, seismic testing for drilling reportedly caused multiple houses in Weirton to suffer foundation damage.

VULNERABLE STRUCTURES – WORST CASE SCENARIO EVENT

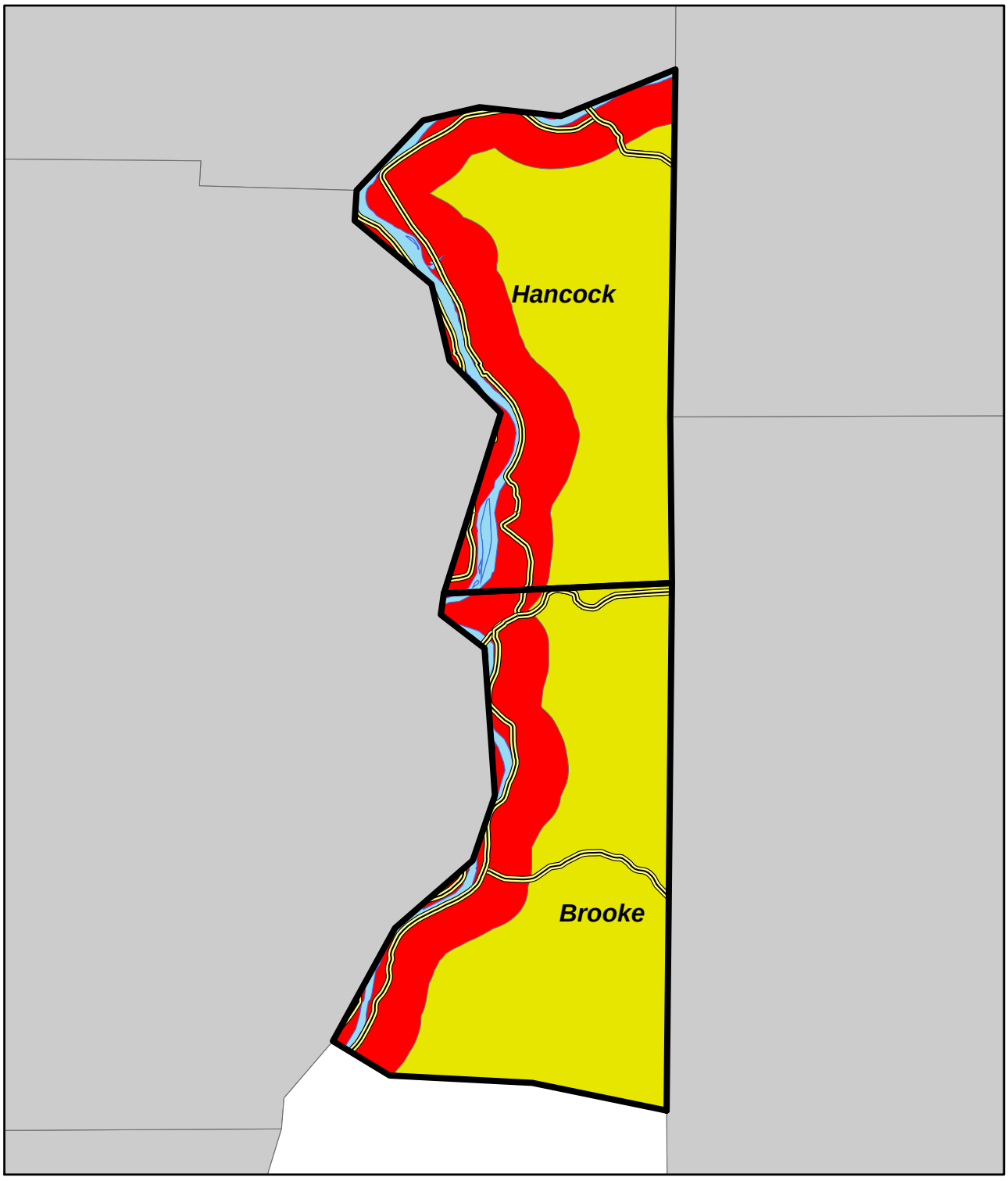
Vulnerable Structures – Land Subsidence								
County	*Residential*	*Commercial*	*Industrial*	*Agricultural*	*Religious*	*Government*	*Education*	*Utilities*
Brooke	7,818	175	50	20	28	10	10	10
Hancock	5,406	300	75	20	13	4	3	5
TOTALS	**13,224**	**475**	**125**	**40**	**41**	**14**	**13**	**15**

In a worst-case scenario event, up to 71% of Brooke County's residential structures, 83% of commercial structures, and 83% of government structures could be impacted. In excess of 17,000 residents could be affected. In Hancock County, nearly 40% of the residential structures, 60% of the commercial structures, and 50% of the government structures could be affected. In Hancock County, approximately 37% of the population would be impacted.

LOSS ESTIMATES

Land subsidence can be a gradually-occurring hazard or it can occur rapidly. In either case, repairing damages as a result of subsidence can be costly. Structural foundations can be damaged; transportation and other infrastructure can be damaged; etc. Consequently, subsidence-based loss estimates are somewhat high. If the entire

region were to be affected by a single WCS event, losses could total as much as $731,470,297. *NOTE: A region-wide estimate was not compiled since land subsidence is often considered a site-specific hazard.


Hancock
Brooke
Vulnerability to Land Subsidence
Moderate Hazard
High Hazard

2.2.9: Radiological Hazard

A radiological incident is any unintended event, including operating error, equipment failure, or other mishap, the consequence or potential consequence of is the release of a radiological material(s).

RESEARCH SOURCES

- Interviews with Local Officials

Period of Occurrence:	At any time
Number of Events to Date (2001 – 2011):	0
Probability of Event:	Infrequent
Warning Time:	Hours – Contingent on type of hazard, size of release, quantity of release, etc.
Potential Impacts:	Potential loss of human life, economic loss, environmental damage, disruption of lifeline facilities, all due to contamination
Cause Injury or Death:	Injury and risk of multiple deaths over time related to contamination
Potential Facility Shutdown:	Days to weeks or more

HAZARD EFFECTS

The radiological hazard in the region surrounds primarily the Beaver Valley Power Station in Shippingport, Pennsylvania. Although minor radiological events could occur as a result of transport of medical-grade or industrial-grade materials, these incidents would likely be considered "hazardous materials" in nature rather than radiological. A full radiological event would be of the type described in the emergency response plans developed for the Beaver Valley site.

The Beaver Valley site consists of two (2) nuclear reactors, the first of which went online in 1976 and the second of which went online in 1987. Both are Westinghouse light water pressurized water reactors with a design net output of 852 megawatts. At least one (1) reactor is expected to be operational at the site until 2016 (or 2026).

The northeastern-most portions of Hancock County are considered a part of the "emergency planning zone", including the City of Chester and portions of Newell. The 50-mile planning zone includes all of Hancock and Brooke Counties. According to estimates in the radiological plan for Hancock County, as many as 23,500 people are in the primary emergency planning zone. It should be noted, however, that the entire region should be considered as "affected" by a potential incident. Even during small releases, if not needing to be evacuated, Brooke County would likely serve as a host

community.

The radiological hazard has always received adequate attention in the region due to the presence of Beaver Valley. Across the country, however, attention has shifted to the nuclear industry because of the Tohoku earthquake in Japan and the resulting nuclear emergency at the Fukushima power plant. The Nuclear Regulatory Commission (NRC) as well as local communities are re-analyzing risk, vulnerability, and response capabilities should nuclear emergencies occur. As a result, the region may see some changes in the designation of the Emergency Planning Zone (EPZ) from the Beaver Valley site.

The radiological hazard is included in this plan to show overall hazard risk. It should be noted, however, that more detailed risk assessments are available through both the Hancock County Office of Emergency Management and Brooke County Emergency Management Agency. This document does not attempt to fully assess the risk; it simply aims to be consistent with the more detailed risk assessments compiled specifically for the radiological hazard.

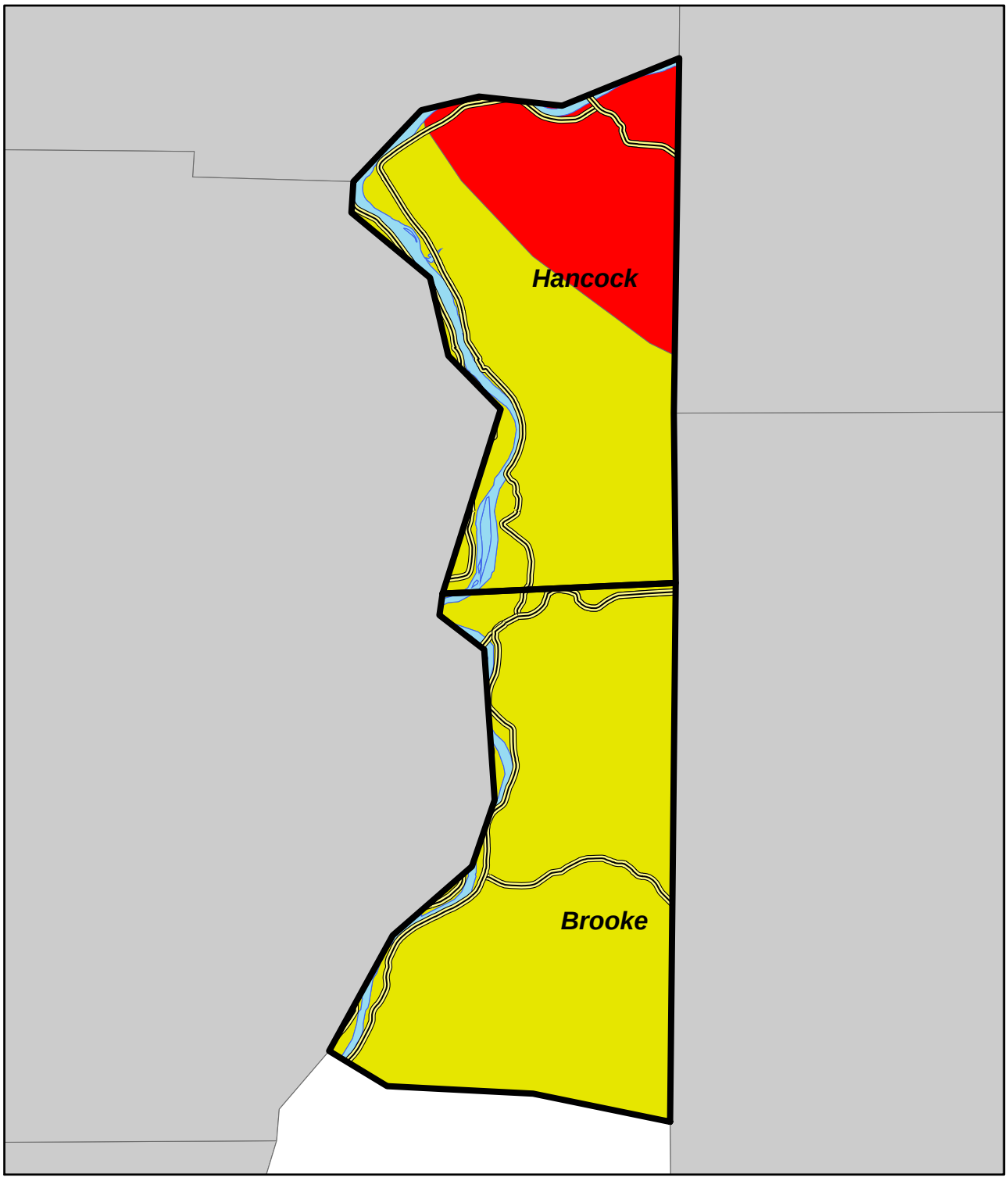
VULNERABLE STRUCTURES – WORST CASE SCENARIO EVENT

It should be noted that structure estimates were based on the primary emergency planning zone (which does not extend into Brooke County).

Vulnerable Structures – Radiological Hazard								
County	*Residential*	*Commercial*	*Industrial*	*Agricultural*	*Religious*	*Government*	*Education*	*Utilities*
Brooke	0	0	0	0	0	0	0	0
Hancock	11,197	150	20	50	27	2	2	3
TOTALS	**11,197**	**150**	**20**	**50**	**27**	**2**	**2**	**3**

LOSS ESTIMATES

Radiological hazards can be gradually-occurring or it can occur rapidly. In either case, repairing damages and decontaminating assets will be costly. Consequently, loss estimates are high. It should be noted, though, that loss estimates were only done for the primary emergency planning zone (which does not extend into Brooke County). Losses in the emergency planning zone could total as much as $1,038,743,419.



Vulnerability to Radiological

- Moderate Hazard
- High Hazard

Note: High Hazard area is determined by Emergency Planning Zone (EPZ).

2.2.10: Terrorism

Terrorism is the use of force or violence, including threats of force or violence, against persons or property in violation of the criminal laws of the United States for the purposes of intimidate, coercion, or ransom.

RESEARCH SOURCES

- Interviews with Local Officials

Period of Occurrence:	At any time
Number of Events to Date (2001 – 2011):	0
Probability of Event:	Infrequent
Warning Time:	Minimal – Depends on the presence of a threat
Potential Impacts:	Potential loss of human life, economic loss, environmental damage, disruption of lifeline facilities
Cause Injury or Death:	Injury and risk of multiple deaths
Potential Facility Shutdown:	Days to weeks or more

HAZARD EFFECTS

"Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber attacks (computer-based); and the use of chemical, biological, nuclear and radiological weapons. High-risk targets for acts of terrorism include military and civilian government facilities, international airports, large cities, and high-profile landmarks. Terrorists might also target large public gatherings, water and food supplies, utilities, and corporate centers. Further, terrorists are capable of spreading fear by sending explosives or chemical and biological agents through the mail." (*Source: USDHS FEMA*)

NOTE: Throughout the remainder of this profile, terrorism will be discussed generally. This profile does not include any information on any threats that have been received, specific listings of potential targets in the region, etc.

HAZARD PROFILE

All of the counties in the region contain what could be considered "targets". In general, governmental, educational, and industrial facilities could be considered *targets*, but such a consideration usually has more to do with other circumstances surrounding the facility than the facility's identification as a governmental, educational, or industrial

facility.

Terrorism is not always accomplished on a “grand scale”, as is the case with international terrorists who are attempting to coerce the federal government. Such terrorism, while technically a hazard in throughout the region, is more unlikely than what is known as “domestic terrorism”. Domestic terrorism can involve disgruntled employees (in the case of large industrial plants), angry parents (at schools), upset citizens (at government facilities), etc. Domestic terrorists may often only intend to harm a single individual or a small group of individuals, but the threat of their actions can be highly disruptive. Historical acts of domestic terrorism include such incidents as the Columbine High School shooting and the bombing of the Murrah Federal Building in Oklahoma City.

A terrorist event would, at a minimum, cripple the region. The effects of a terrorist incident are not only monetary; they are often emotional and symbolic. The majority of the communities throughout the region are rural and small. Any mass loss of life would take an emotional toll on the affected and nearby communities. Recent technological hazard incidents in West Virginia (e.g. the Sago and Upper Big Branch mine disasters) have shown how these losses of life impact the entire state.

Symbolically, an implemented act of terrorism would erode the feeling of security that the region enjoys. It would also likely result in a loss of faith in local decision makers and public safety officials. A loss of public support, especially in the public safety and emergency services sectors, could affect agency operating budgets, personnel recruitment, etc., thus adversely affecting the level of service that could be provided in subsequent years.

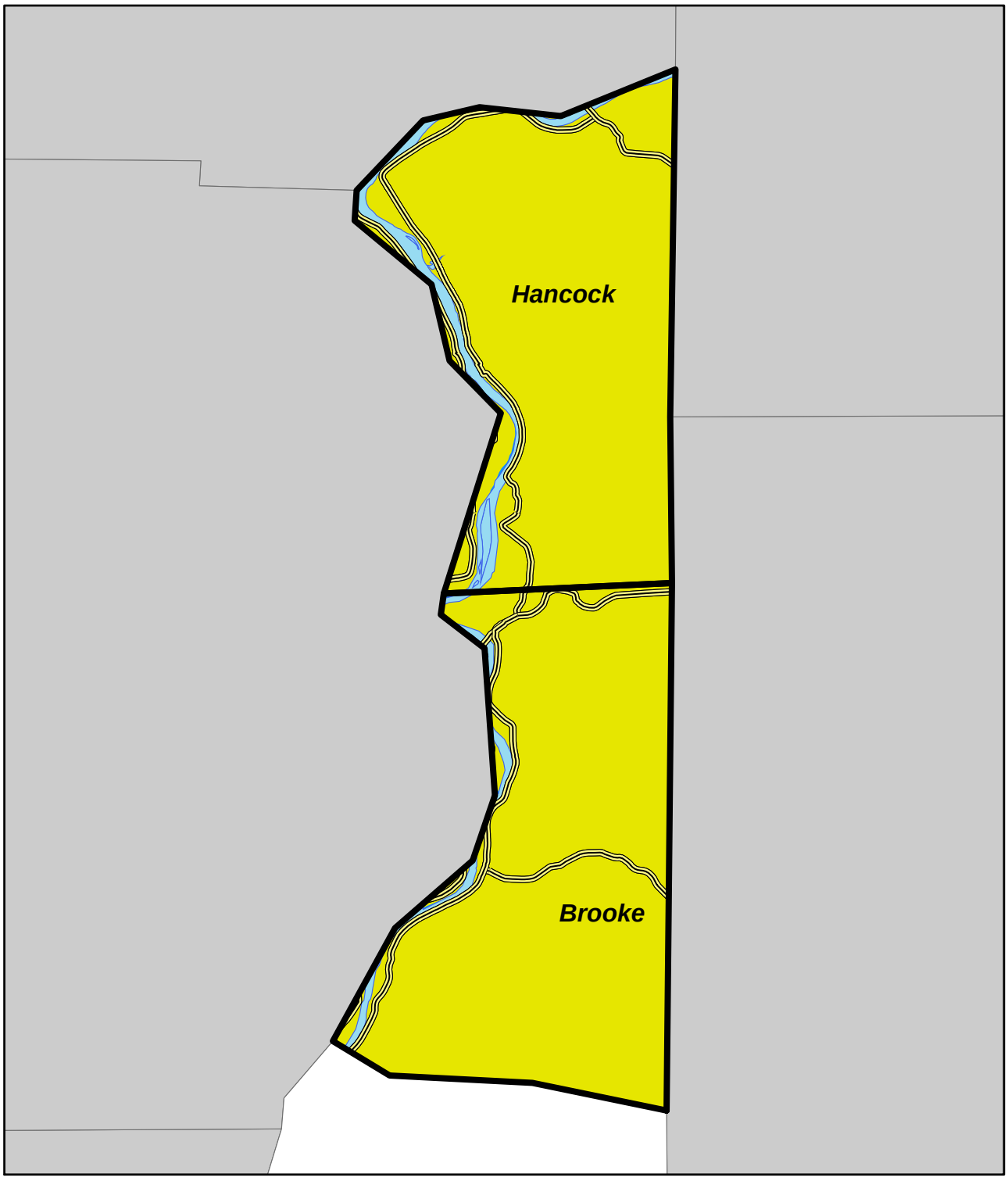
The most obvious effects of a terrorist incident would be economic. Infrastructure, including “hard” infrastructure such as facilities and systems, but also “soft” infrastructure such as people could be diminished or destroyed. Any loss of tax base and employment would be extremely hard for the communities throughout the region to overcome.

VULNERABLE STRUCTURES – WORST CASE SCENARIO EVENT

Vulnerable Structures – Terrorism								
County	*Residential*	*Commercial*	*Industrial*	*Agricultural*	*Religious*	*Government*	*Education*	*Utilities*
Brooke	4,822	150	75	0	0	12	11	5
Hancock	6,771	200	109	0	0	8	8	6
TOTALS	**11,593**	**350**	**184**	**0**	**0**	**20**	**19**	**11**

LOSS ESTIMATES

In an effort to assist jurisdictional understanding of risks and implementation of strategies, loss estimates were done for each county (see Appendix 2). If all assets in the region were affected by a terrorist incident, losses could be as much as $1,347,067,525.



Vulnerability to Terrorism

Moderate Hazard

2.2.11: Thunderstorm

A thunderstorm is considered severe when that storm produces a tornado, winds of at least 58 mph (50 knots), and/or hail at least ¾" in diameter. Structural wind damage may imply the occurrence of a severe thunderstorm. A thunderstorm wind equal to or greater than 40 mph (35 knots) and/or hail of at least ½" is defined as "approaching severe".

RESEARCH SOURCES

- NCDC Event Records

Period of Occurrence:	Spring, summer, and fall
Number of Events to Date (1957 – 2011):	175
Probability of Event:	Frequent
Warning Time:	Minutes to hours
Potential Impacts:	Utility damage and outages, infrastructure damage (transportation and communication systems). Impacts human life, health, and public safety.
Cause Injury or Death:	Injury
Potential Facility Shutdown:	Days

HAZARD EFFECTS

The wind gusts associated with thunderstorms pose a threat to life and/or property. Severe thunderstorms also have the potential of producing a tornado with little or no advanced tornado warning. These storms may contain frequent cloud-to-ground lightning and heavy downpours which can lead to localized flooding. Generally, a weak thunderstorm which produces a wind gust of the required strength would be defined as "severe" whereas a very violent thunderstorm with continuous lightning and very heavy rain (but without the required wind gusts, hail, or tornado/funnel cloud) would not. For the purposes of this plan, though, these violent thunderstorms are also considered severe because they are more frequent and cause a significant amount of damage annually throughout the county.

HAZARD PROFILE

Thunderstorms are one of the most frequently-occurring hazards throughout the region (second only to winter storms). The following table illustrates the number of thunderstorm events in each of the region's counties as well as the damage caused by those storms (*Source: NCDC Event Records*).

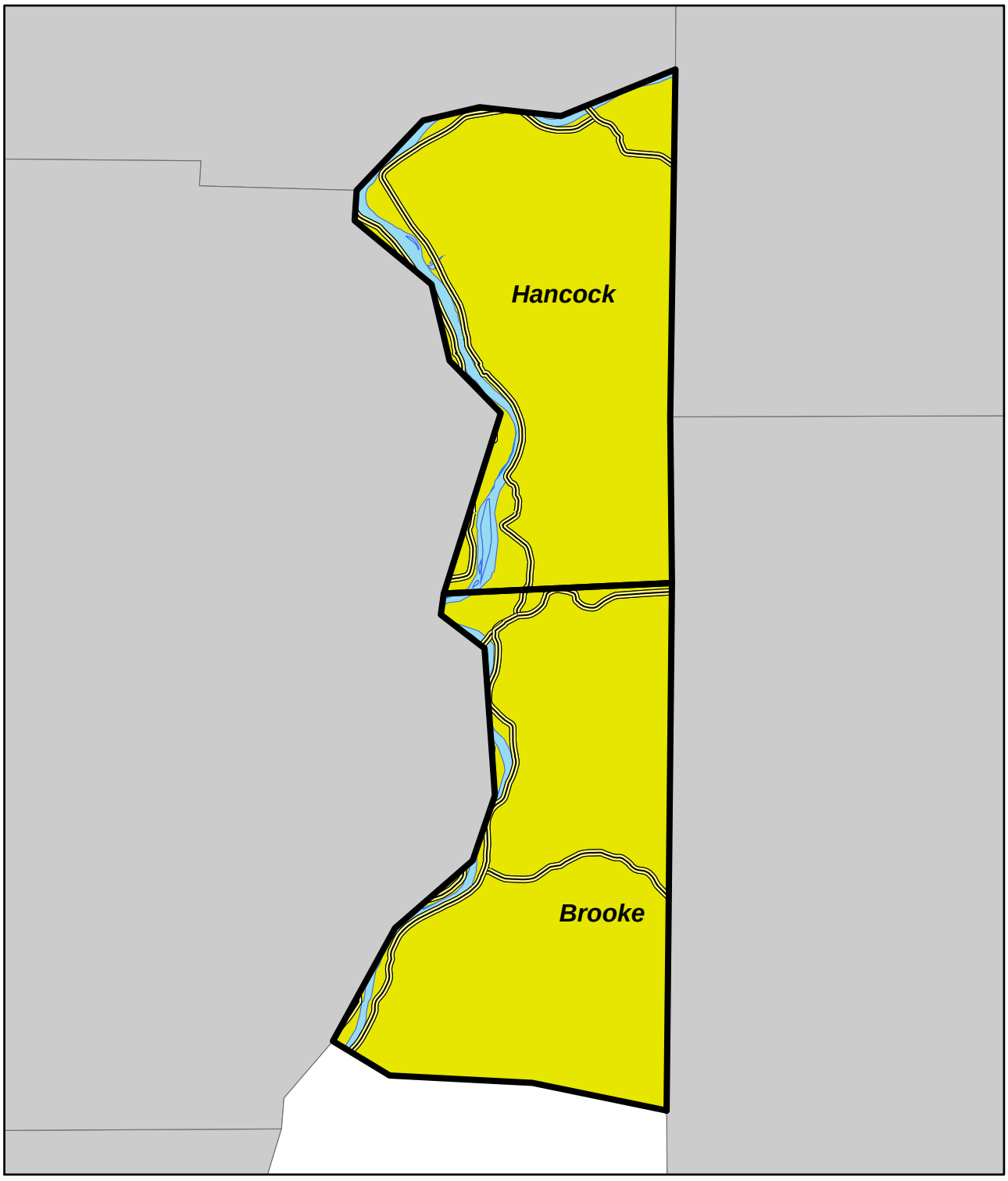
Thunderstorms Throughout Region 11		
County	*Number of Storms*	*Reported Damage*
Brooke	87	$970,000
Hancock	88	$645,000
TOTALS	**175**	**$1,615,000**

NCDC records reflect the most severe of thunderstorms. Storms, however, are common throughout the spring and summer months (although a thunderstorm can occur in any season) that cause downed trees and power lines. Residents and businesses are likely to incur more damage as a result of these "smaller" storms as individual houses and vehicles are damaged by fallen limbs and businesses are forced to close due to a lack of electricity. Local officials have also indicated a number of cascading events resulting from thunderstorms, including utility and communications system failures.

LOSS ESTIMATES

Thunderstorm is another hazard that can be said to affect the entire region equally (i.e., all structures in the region are at risk). If the entire region were to be affected by a WCS thunderstorm event, losses could total as much as $29,044,431.

In many ways, the cascading effects of thunderstorms are more damaging than the storm itself. For example, as mentioned above, lightning strikes may cause power surges that result in damage. Thunderstorm winds may down trees that fall onto personal property. Tracking these types of damages is difficult as many people may not turn such claims into their insurance.



Vulnerability to Thunderstorm

Moderate Hazard

2.2.12: Wildfire

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

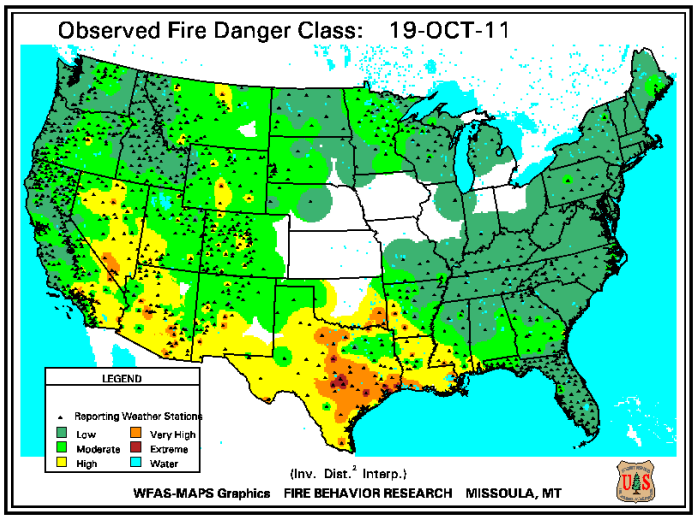
RESEARCH SOURCES

- Interviews with Local Officials

Period of Occurrence:	At any time – Primarily summer
Number of Events to Date (1950 – 2011):	0
Probability of Event:	Infrequent
Warning Time:	Minimal
Potential Impacts:	Impacts human life, health, and public safety. Loss of wildlife habitat, increased soil erosion, and degraded water quality. Utility damage and outages, infrastructure damage (transportation and communication systems), and damaged or destroyed critical facilities.
Cause Injury or Death:	Injury and risk death
Potential Facility Shutdown:	Days to weeks or more

HAZARD EFFECTS

Wildfires often begin unnoticed and spread quickly. They are usually signaled by dense smoke that fills the area for miles around. Grasses, bushes, trees, and other vegetation supply fuel for the wildfire. The size of a wildfire is contingent on the amount of fuel available, weather conditions, and wind speed and direction. In a map from Wildland Fire Assessment System (WFAS)-Maps, Fire Behavior Research (see left), the majority of West Virginia was labeled as being at low risk for wildfires. The National Interagency Fire Center also indicates that both counties are at a low risk of wildfires.



HAZARD PROFILE

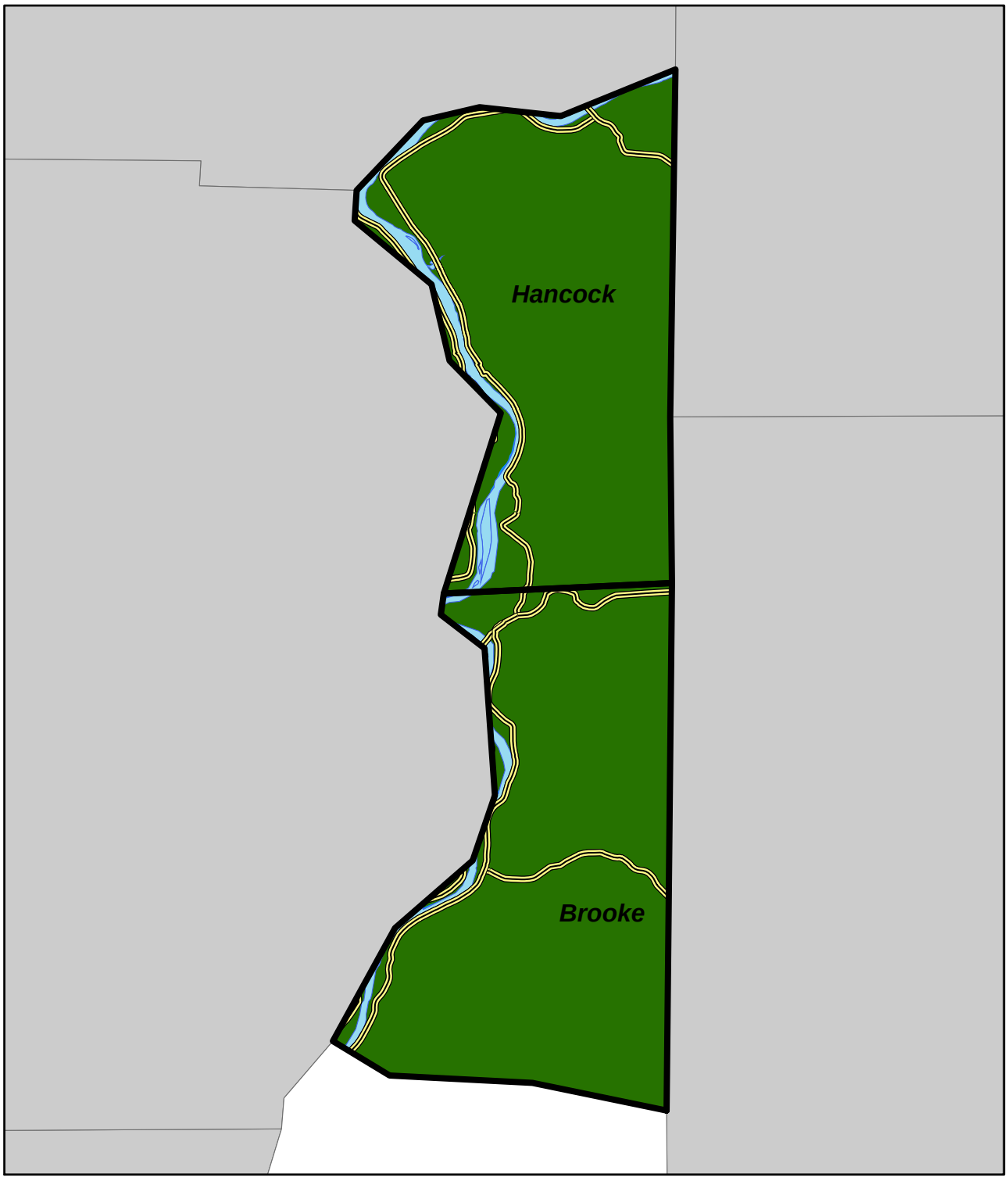
Just because no wildfires have been reported, one should not assume that vegetation fires do not occur frequently. Representatives from local fire departments throughout the region confirm that brush fires, ranging in size from a single acre to hundreds of acres occur each year. Many of these fires are extinguished before becoming a major problem. Additionally, most of these events occur in rural areas rather than in areas of urban-wildland interface.

VULNERABLE STRUCTURES – WORST CASE SCENARIO EVENT

Vulnerable Structures – Wildfire								
County	*Residential*	*Commercial*	*Industrial*	*Agricultural*	*Religious*	*Government*	*Education*	*Utilities*
Brooke	2,762	50	0	104	10	0	2	5
Hancock	7,128	100	0	109	18	0	2	3
TOTALS	**9,890**	**150**	**0**	**213**	**28**	**0**	**4**	**8**

LOSS ESTIMATES

Individual county loss estimates were calculated on the assumption that a wildfire could occur in an area of urban-wildland interface; consequently, the estimates could be considered high when compared to historical occurrences. This document, however, estimates losses based on WCS events. The potential losses from a single WCS event could be up to $534,775,977.



Vulnerability to Wildfire

Low Hazard

2.2.13: Wind

Wind storms are destructive wind events that occur with or without the presence of other storm events, such as tornados or severe thunderstorms.
A tornado is a violently rotating column of air extending from a thunderstorm to the ground.

RESEARCH SOURCES

- NCDC Event Records

Period of Occurrence:	At any time – Primarily during March through August
Number of Events to Date (1995–2011):	21 (0 tornado events)
Probability of Event:	Infrequent
Warning Time:	Minutes to hours
Potential Impacts:	Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, and damaged or destroyed critical facilities. Impacts human life, health, and public safety.
Cause Injury or Death:	Injury and risk of multiple deaths
Potential Facility Shutdown:	Days to weeks or more

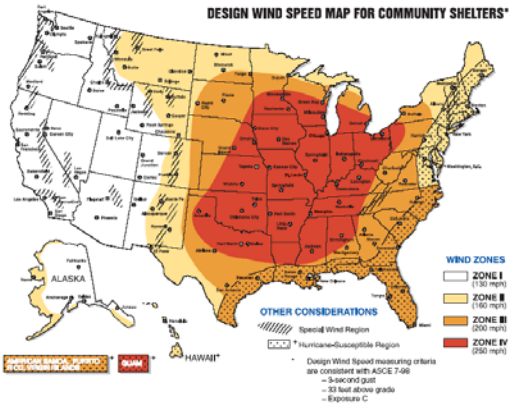
HAZARD EFFECTS – WIND

A wind storm is a severe weather condition indicated by high winds and with little or no rain. Localized geographical conditions can exacerbate the damages from high winds and cause increases in wind intensity. Since 1995, the counties have experienced a combined 21 high wind events.

HAZARD PROFILE – WIND

These events have resulted in significant damage. The following table illustrates the high wind events, damages reported, and injuries known for each county.

High Wind Events in Region 11			
County	*Number of Events*	*Damages Reported*	*Known Injuries*
Brooke	10	$442,000	0
Hancock	11	$465,000	0
TOTALS	**21**	**$907,000**	**0**



The "Design Wind Speed Map for Community Shelters" is one way of graphically analyzing wind risks. As can be seen, all of the counties in the region are in a "Zone III" with respect to design wind speeds, which means that shelters constructed for protective purposes should be designed to withstand up to 200 mph winds.

Severe wind events can cause a variety of secondary, or cascading, hazard events. For instance, wind may blow limbs from trees down knocking out electric power or blocking roadways. Wind often results in damages to roofs and other home finishings (such as siding, etc.).

HAZARD EFFECTS - TORNADO

The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of one (1) mile wide and 50 miles long. Tornadoes are among the most unpredictable of weather phenomena. Tornadoes can occur in any state in the United States but are more frequent in the Midwest, Southeast, and Southwest.

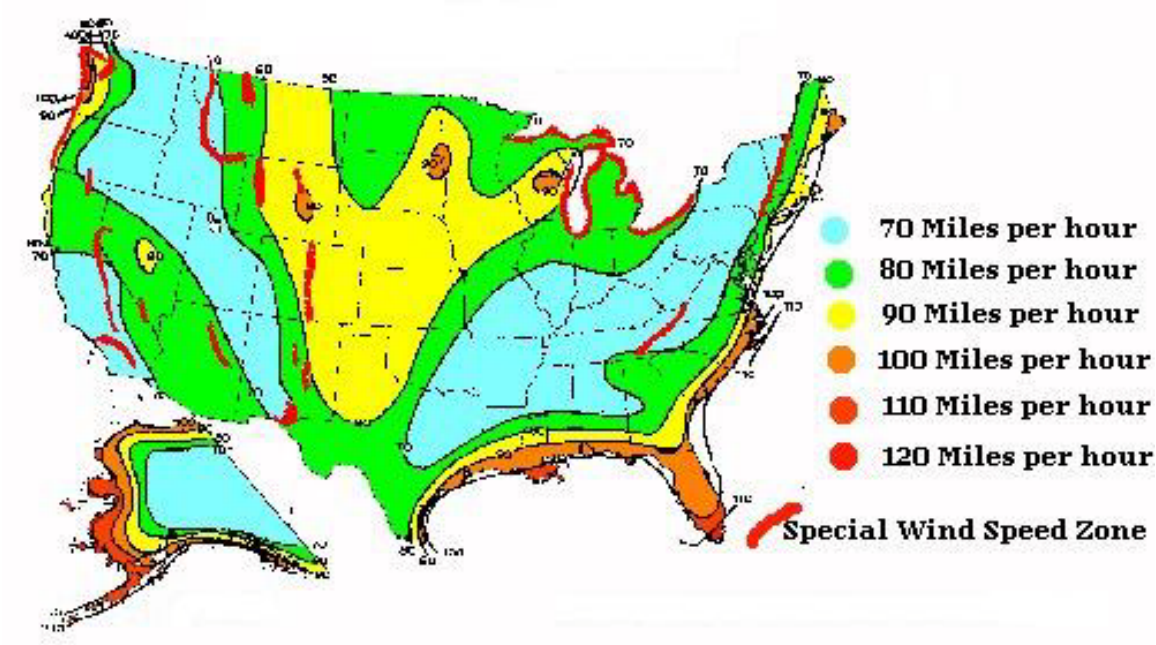
The nature of tornadoes is that they strike at random. While it is known that some areas of the country experience tornadoes more than others, predicting exactly what parts of the region have a greater chance of being struck by a tornado is difficult.

For planning purposes, it is less important to map the tornado risk than it is to identify it. This is because it is so difficult to predict the path of future tornadoes. The Fujita scale provides us with an idea of the strength and extent of damages of tornadoes that can occur in the region. An additional resource to help understand the extent of tornado risks in the county is the "Design Wind Speed Map for Community Shelters" developed by the Disaster Center. The Disaster Center has also developed a map (shown below) that is

	Description	Wind Speeds
F0	***Gale Tornado***: Some damage to chimneys; break branches off of trees, pushes over shallow-rooted trees, damages signs.	40-70
F1	***Moderate Tornado***: The lower limit is the beginning of hurricane wind speed; peels surfaces off of roofs; mobile homes destroyed.	73-112
F2	***Significant Tornado***: Considerable damage; roofs torn off frame houses; mobile homes demolished; boxcars pushed over; larger trees snapped or uprooted; light object missiles generated.	113-157
F3	***Severe Tornado***: Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.	158-206
F4	***Devastating Tornado***: Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown; large missiles generated.	207-260
F5	***Incredible Tornado***: Strong frame houses lifted off foundations and carried considerable distances; automobile-sized missiles fly in excess of 100 meters.	261-318
F6	***Inconceivable Tornado***: The area of damage produced would be unrecognizable.	319-379

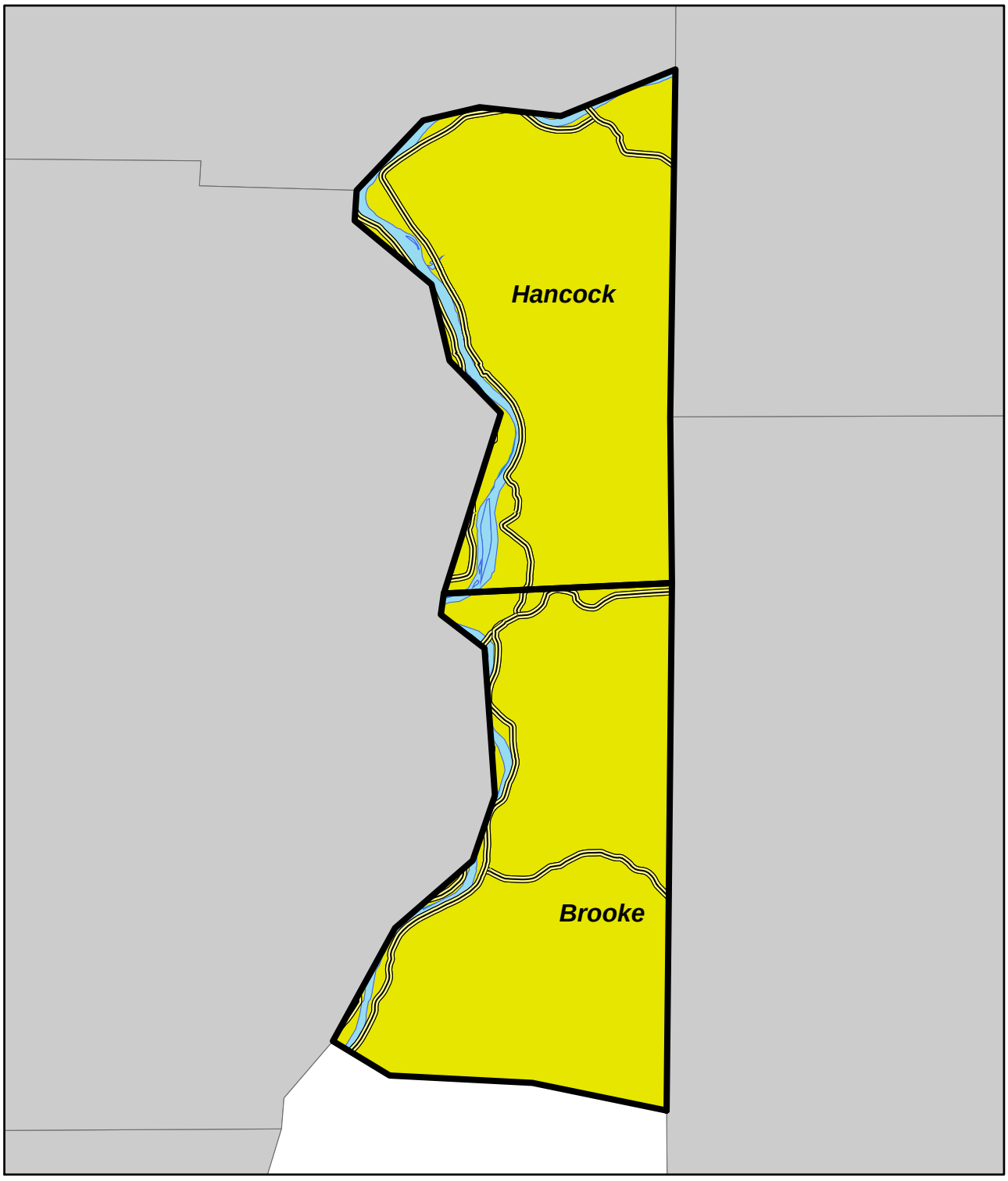
similar to the "Design Wind Speed Map for Community Shelters" that suggests building standards with respect to wind speed.

As can be seen, all of West Virginia is shown with the lowest wind speed (or the equivalent to a "gale tornado" as described above). High wind, in general, is another of the hazards that can be said to affect the entire region. Tornadoes can also be said to affect the entire region due to their unpredictable nature.



LOSS ESTIMATES

Wind-related loss estimates are quite high because both high wind and tornado loss estimates are combined and because of the amount of damage that can be done by a single incident. As an example, consider the extremely high damage estimates from the tornado events versus just the high wind events. Losses from a single WCS wind event could total as much as $21,783,324.



Vulnerability to Severe Wind

Moderate Hazard

2.2.14: Winter Storm

A winter storm is a type of storm in which the dominant varieties of precipitation are forms that only occur at cold temperatures such as snow or sleet, or a rainstorm where ground temperatures are cold enough to allow ice to form.

RESEARCH SOURCES

- NCDC Event Records

Period of Occurrence:	Winter
Number of Events to Date (1993 – 2011):	55
Probability of Event:	Likely
Warning Time:	Snow – Days Ice – Minutes to hours
Potential Impacts:	Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, damaged critical facilities. Can cause severe transportation problems and make travel extremely dangerous. Power outages, which result in loss of electrical power and potentially loss of heat. Extreme cold temperatures may lead to frozen water mains and pipes, damaged car engines, and prolonged exposure to cold resulting in frostbite.
Cause Injury or Death:	Injury
Potential Facility Shutdown:	Days

HAZARD EFFECTS

Winter storms vary in size and strength and can be accompanied by strong winds that create blizzard conditions and dangerous wind chill. There are three (3) categories of winter storms:

- **Blizzard:** A blizzard is the most dangerous of all winter storms. It combines low temperatures, heavy snowfall, and winds of at least 35 miles per hour (mph), reducing visibility to only a few yards.
- **Heavy Snowstorms:** A heavy snowstorm is one that drops four (4) or more inches of snow in a 12-hour period.
- **Ice Storm:** An ice storm occurs when moisture falls and freezes immediately upon impact.

Winter storms tend to encompass the entire county whereas flooding generally occurs within predictable boundaries along the regulatory Special Flood Hazard Area (SFHA) and its main branches and tributaries. Risks associated and identified with severe winter storms include but are not limited to the following:

- Emergency medical evacuation of the sick, elderly, and infirmed to shelters.
- Power outages to those on life support systems.
- Communications interruptions and/or outages.
- Loss of the ability to heat homes.
- Interruption of the delivery of home supplies and food.

These above-described events fall within two (2) general categories 1) road closures due to snow drifts and 2) utility failures (such as damaged supply lines). Additionally, data indicates that structural damage has occurred in several instances in the past as a result of extremely heavy snowfall. Structures damaged were usually buildings such as barns, garages, carports, etc. Additionally, severe winter storms, because of the county's mountainous terrain, frequently result in dangerous driving conditions.

HAZARD PROFILE

Winter storms are reported to be the most frequently-occurring hazard in the region. The following table illustrates the number of winter storm (i.e., snow, ice, and blizzard) events in each of the region's counties as well as the damage caused by those storms (*Source: NCDC Event Records*).

Winter Storms Throughout Region 11		
County	*Number of Storms*	*Reported Damage*
Brooke	27	$792,000
Hancock	28	$844,000
TOTALS	**55**	**$1,636,000**

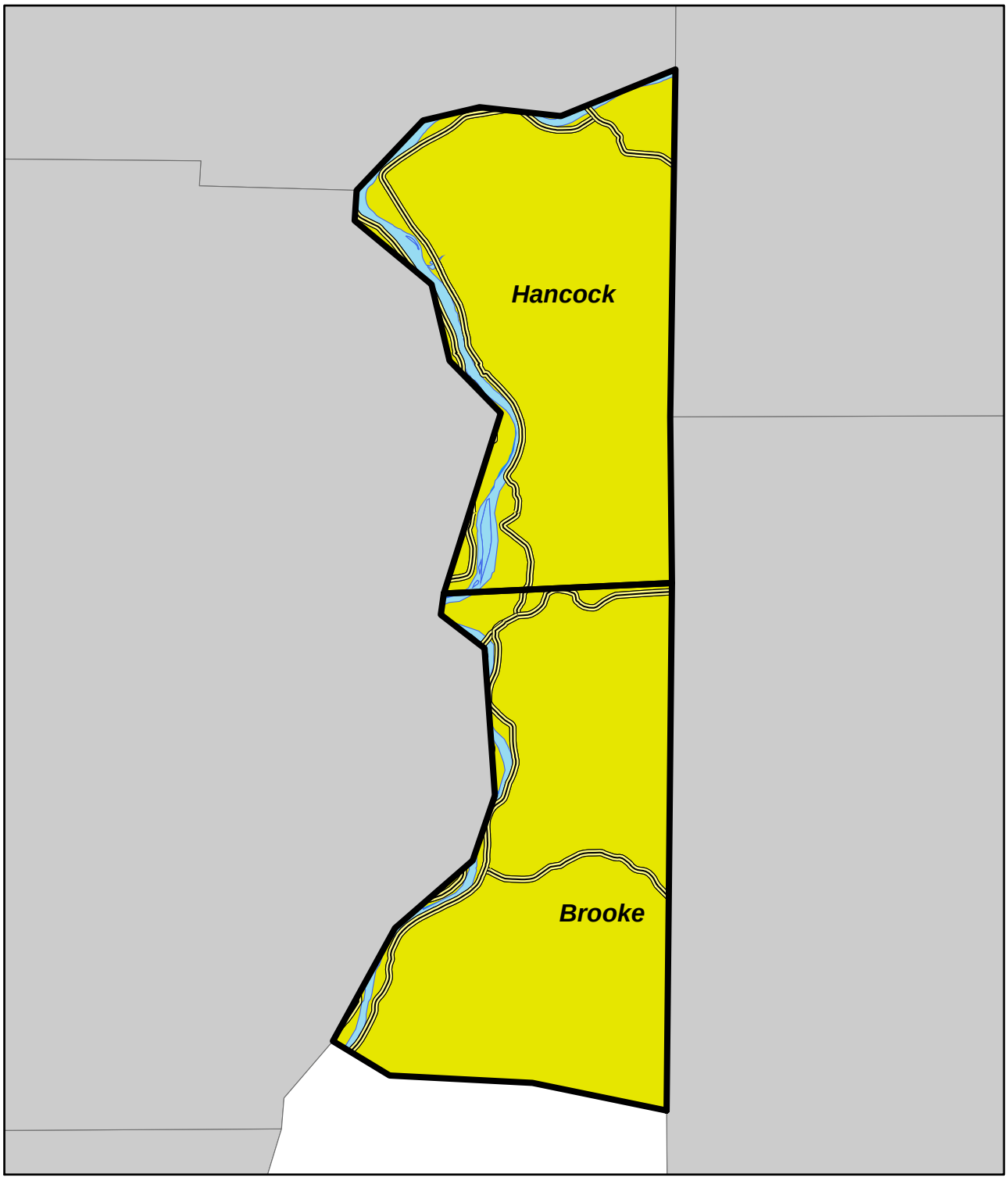
Local officials have indicated that a number of "service calls" are received during periods of severe winter weather. Such calls reference stranded residents, lack of medications and other medical supplies, etc. The NCDC reports only two (2) injuries as a result of winter weather per county; local officials have indicated that that number is likely very low.

A winter storm is another hazard that can be said to affect the entire region equally (i.e., all structures in the region are at risk). One must realize, though, that the cascading hazards resulting from winter storms (e.g., slick roadways, drifts covering roadways, communities being isolated as a result of snow, etc.) can vary within the region – even within a single county – due to factors such as topography. Further, winter storms are often considered "just a way of life"; many residents do not report the losses from these storms.

The "cascading" effects of winter storms are often just as damaging as the actual storm. Such was the case during the 2009 and 2010 winter storms, which widespread power outages significantly affected much of West Virginia. Other concerns, such as communications failures, heating failures, etc. could also be present.

LOSS ESTIMATES

As part of the loss estimates completed by all of the region's counties, losses from a single WCS winter storm event could be up to $29,044,431.



Vulnerability to Winter Storm

Moderate Hazard

2.3 REGIONAL IMPLICATIONS

The hazard profiles above present, in a general sense, a regional hazard risk. This risk, though, is based off of individual county assessments of how risk *individual counties*. This section discusses how region-wide risks are realized.

In a situation that is somewhat unique for West Virginia, the counties comprising the region share a municipality, as the City of Weirton straddles the Brooke and Hancock County line. The city is the economic anchor of the Brooke/Hancock County region and, together with Steubenville to the immediate west across the Ohio River, of a much larger area positioned between Youngstown and Pittsburgh. As such, a number of emergency preparedness decisions – in both the mitigation and preparedness phases – are made "jointly". For example, if the City of Weirton floods, both counties are affected from an economic, functional standpoint. (Structural and contents losses would likely be allocated to the county in which the affected facility is physically located.) A hazardous material incident in the Half Moon Industrial Park in western Weirton would affect portions of both counties; the response to such an incident would likely see responders from both counties (and possibly from Jefferson and Columbiana Counties in Ohio).

The entire region has a number of hazard vulnerabilities "in common". For example, both are in the overall hazard zone for the Beaver Valley Nuclear Power Plant. Other features, such as the Ohio River, create a number of vulnerability similarities. As an example, given the industry along the Ohio River, an incident such as an oil spill could have regional implications. If, for example, a spill were to happen in the Newell area, then Hancock County emergency personnel would contact New Cumberland, Weirton, and Brooke County. Brooke County would contact its municipalities, Ohio County, and so on.

Flooding is somewhat difficult to describe on a regional level. Riverine flooding, particularly along the Ohio River, can be regional in nature. For example, flood stage at New Cumberland *and* Wellsburg is approximately 36'; as such, if one municipality approaches flood stage, the other is usually notified. In general, though, local emergency managers indicate that they monitor rainfall in Maryland, the Blackwater Canyon area of West Virginia and other points east in an effort to calculate the ultimate effect on the Ohio River. Such decisions can be used to make decisions about evacuation of residents, employees, and visitors. By monitoring rainfall in the Maryland area, up to a few days of lead time for said evacuation can be had. It should be noted that an

evacuation along SR 2 could be hindered by land subsidence issues near Wellsburg. Flooding could be the cause of some of the subsidence, as could slippage, etc. As a main north-south arterial route, subsidence-based closures of SR 2 during floods (or any other periods) could pose a significant challenge.

Small stream flooding, though, is more sporadic. For instance, small stream flooding can occur in Brooke County and not affect Hancock County. Such flooding would likely eventually end up in the Ohio River, but cause more of a problem downstream from the region rather than elsewhere in the region. Conversely, should Hancock County see an uptick in small stream flooding, it may notify Brooke County as Brooke may see flooding issues once all of the water makes its way to the Ohio River.

Brooke and Hancock Counties also see slight variances to a number of other hazards, such as winter storms. In could be snowing hard in Ohio County (to the south of the region) or even in Brooke County, yet Hancock County would only receive a dusting. It is significant to note that wind currents tend to blow west to east across the region rather than north-south. The area, in terms of winter storms, in not only affected minimally by Lake Erie weather patterns, but also (like much of the remainder of the state) patterns from the Gulf of Mexico and Atlantic Ocean. This “crossover area” effect could contribute to the perceived inconsistencies in winter weather patterns.

SECTION 3.0

MITIGATION STRATEGY

Section 3.0 uses the risk assessment information from Section 2.0 to generate a list of action items that Region 11's member governments can consider to greatly lessen potential hazard losses. This section lists and prioritizes them.

It is significant to note that though this is the first version of the regional Hazard Mitigation Plan (HMP), member governments have maintained lists of projects since approximately 2004. The status indicators discussed below factor this time period into account. All status boxes in Section 3.1 read "New" since this plan itself is new; status descriptions in Section 3.2 represent what the locality has done to date.

3.1 GOALS, OBJECTIVES, AND STRATEGIES

§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.

Several hazard mitigation projects have been listed in this plan. It is significant to note that mitigation projects are developed in much the same way as other projects (i.e., community and economic development projects) considered and/or administered by the Brooke-Hancock-Jefferson Metropolitan Planning Commission (BHJ). Member governments – in this case, their emergency management/preparedness representatives – are encouraged to compile lists of the projects they feel are most beneficial to their jurisdiction. These projects are submitted to BHJ for (consideration by and) inclusion into this plan.

Goals, objectives, and projects are only listed in this section as a "quick reference guide" for users of the plan. Projects are organized both by hazard and jurisdiction. A simple status statement is also listed for each project. Projects can be classified as: New, Completed, Deleted, Deferred, Unchanged, or On-Going. Detailed discussions on the implementation and prioritization of mitigation projects, including an explanation of each status indicator, can be found in Sections 3.2 and 3.3 below.

BROOKE-HANCOCK-JEFFERSON PLANNING COMMISSION REGIONAL AREA

Goal 1: Lessen flood risks throughout the region.

Objective 1.1: Ensure continued participation in and compliance with the National Flood Insurance Program (NFIP).

Project 1.1.1: Support municipal NFIP efforts.

Status: New

Project 1.1.2: Ensure adequate public education as well as training and education for local government officials regarding the NFIP.

Status: New

Project 1.1.3: Undertake buy-outs, elevation projects, and/or relocate flooded structures if and when funding is available.

Status: New

Project 1.1.4: Continue to collect information on Repetitive Loss (RL) properties (to include general areas, lowest floor elevations, etc.) to aid in possible future implementation of the projects as well as in refining a strategy for addressing RL areas in future versions of this plan.

Status: New

Goal 2: Enhance mitigation efforts through public education and engaging in cooperative preparedness efforts.

Objective 2.1: Educate the public on hazard mitigation and preparedness.

Project 2.1.1: Prepare public information campaigns regarding risks and family preparedness for such hazards as thunderstorms, high winds, hailstorms, earthquakes, and winter storms.

Status: New

Project 2.1.2: Partner with agencies throughout the region in support of mitigation and preparedness measures, to include but not be limited to the NextGen project, continued maintenance of this plan, etc.

Status: New

Project 2.1.3: Form a preparedness "task force" with officials from industries such as oil and natural gas exploration to determine actual risks, share findings and facts, etc.

Status: New

Goal 3: Reduce the impacts of hazardous materials on the region.

Objective 3.1: Clean up areas that have been identified as "contaminated".

Project 3.1.1: Undertake Brownfields projects to lessen on-going contamination at former industrial sites.

Status: New

Goal 4: Better identify hazard areas and the vulnerabilities within them.

Objective 4.1: Fully identify risk areas with respect to the dam failure hazard.

Project 4.1.1: Coordinate, as appropriate, with partners throughout the region to identify the location of privately-owned dams as well as contact information for the owners of those structures.

Status: New

BEECH BOTTOM, VILLAGE OF

Goal 1A: Review and comment on the *Brooke County Hazard Mitigation Plan*.

Objective 1A.1: Work with Brooke County Hazard Mitigation Planning Committee to periodically update plan.

Status: On-Going

Objective 1A.2: Provide input into mitigation goals of the county, including review of risk rankings, calculation of loss estimates, and production of critical facilities listing.

Project 1A.2.1: Work with the Brooke County Emergency Management Agency (BCEMA) and critical facilities to create revised listings of critical facilities within municipal boundaries.

Status: On-Going

Goal 2A: Improve upon the protection of the citizens of Beech Bottom from all natural and man-made hazards.

Objective 2A.1: Develop and distribute public awareness materials about natural hazard risks, preparedness, and mitigation.

Project 2A.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Status: On-Going

Objective 2A.2: Evaluate existing shelters to determine adequacy for current and future populations.

Project 2A.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Status: On-Going

Project 2A.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Status: On-Going

Objective 2A.3: Ensure adequate training and resources for emergency organizations and personnel.

Project 2A.3.1: Establish a Community Emergency Response Team.

Status: On-Going

Project 2A.3.2: Increase the number of trained citizen emergency responders.

Status: On-Going

Project 2A.3.3: Conduct National Weather Service Storm Spotter classes.

Status: On-Going

Goal 3A: Reduce the current and future risks from hazards in Beech Bottom.

Objective: 3A.1: Direct new development away from high hazard areas.

Project 3A.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Status: On-Going

Project 3A.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Status: On-Going

Project 3A.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Status: On-Going

Objective: 3A.2: Establish proper land development legislation.

Project 3A.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the village's floodplain and flood prone areas.

Status: On-Going

Project 3A.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Status: On-Going

Goal 4A: Reduce the potential impact of natural and man-made disasters on private property.

Objective 4A.1: Identify all repetitive loss structures throughout the county.

Project 4A.1.1: Collect updated information on the number and location of all repetitive loss properties throughout the village.

Status: Completed

Project 4A.1.2: Develop a database of information on all repetitive loss properties including maps.

Status: Deleted

Project 4A.1.3: Identify owners of repetitive loss properties that may be willing to participate in future property acquisitions and relocation projects.

Status: Deleted

Goal 5A: Develop better hazard data for Beech Bottom.

Objective 5A.1: Assess vulnerability of transportation systems and assets located in hazard areas.

Project 5A.1.1: Work with the West Virginia Division of Highways (WVDOH) to identify areas of frequent roadway flooding and develop mitigation strategies.

Status: On-Going

Project 5A.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the village.

Status: On-Going

Project 5A.1.3: Implement the National Fire Protection Agency (NFPA) 704 M System to identify all facilities that store hazardous materials.

Status: On-Going

Goal 6A: Develop and implement a local hazard mitigation plan.

Objective 6A.1: Form a local Hazard Mitigation Planning Committee.

Project 6A.1.1: Contact local stakeholders, including the general public, for input and assistance in developing the local plan.

Status: Completed

Objective 6A.2: Distribute local plans countywide.

Status: Completed

BETHANY, TOWN OF

Goal 1B: Review and comment on the *Brooke County Hazard Mitigation Plan*.

Objective 1B.1: Work with Brooke County Hazard Mitigation Planning Committee to periodically update plan.

Status: On-Going

Objective 1B.2: Provide input into mitigation goals of the county, including review of risk rankings, calculation of loss estimates, and production of critical facilities listing.

Project 1B.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Status: On-Going

Goal 2B: Improve upon the protection of the citizens of Bethany from all natural and man-made hazards.

Objective 2B.1: Develop and distribute public awareness materials about natural hazard risks, preparedness, and mitigation.

Project 2B.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Status: On-Going

Objective 2B.2: Evaluate existing shelters to determine adequacy for current and future populations.

Project 2B.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Status: On-Going

Project 2B.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Status: On-Going

Objective 2B.3: Ensure adequate training and resources for emergency organizations and personnel.

Project 2B.3.1: Establish a Community Emergency Response Team.

Status: On-Going

Project 2B.3.2: Increase the number of trained citizen emergency responders.

Status: On-Going

Project 2B.3.3: Conduct National Weather Service Storm Spotter classes.

Status: On-Going

Goal 3B: Reduce the current and future risks from hazards in Bethany.

Objective: 3B.1: Direct new development away from high hazard areas.

Project 3B.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Status: On-Going

Project 3B.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Status: On-Going

Project 3B.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Status: On-Going

Objective: 3B.2: Establish proper land development legislation.

Project 3B.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the town's floodplain and flood prone areas.

Status: On-Going

Project 3B.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Status: On-Going

Goal 4B: Reduce the potential impact of natural and man-made disasters on private property.

Objective 4B.1: Identify all repetitive loss structures throughout the county.

Project 4B.1.1: Collect updated information on the number and location of all repetitive loss properties throughout the town.

Status: Completed

Project 4B.1.2: Develop a database of information on all repetitive loss properties including maps.

Status: Completed

Project 4B.1.3: Identify owners of repetitive loss properties that may be willing to participate in future property acquisitions and relocation projects.

Status: Completed

Goal 5B: Develop better hazard data for Bethany.

Objective 5B.1: Assess vulnerability of transportation systems and assets located in hazard areas.

Project 5B.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Status: On-Going

Project 5B.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the village.

Status: On-Going

Project 5B.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Status: On-Going

Goal 6B: Develop and implement a local hazard mitigation plan.

Objective 6B.1: Form a local Hazard Mitigation Planning Committee.

Project 6B.1.1: Contact local stakeholders, including the general public, for input and assistance in developing the local plan.

Status: Completed

Objective 6B.2: Distribute local plans countywide.

Status: Completed

BROOKE COUNTY

Goal 1C: Develop and implement a hazard mitigation planning committee.

Objective 1C.1: Involve all stakeholders, governmental organizations, and emergency management personnel in the planning process.

Project 1C.1.1: Identified planning team will be involved in every aspect of the planning process, in all future endeavors.

Status: On-Going

Objective 1C.2: Achieve multi-jurisdictional participation.

Project 1C.2.1: Organize cooperation between the participating municipalities in Brooke County.

Status: On-Going

Objective 1C.3: Establish a core team.

Status: Complete

Objective 1C.4: Review current *Brooke County Hazard Mitigation Plan*.

Project 1C.4.1: Review risk assessment, and update accordingly.

Status: On-Going

Project 1C.4.2: Review risk rankings and update accordingly.

Status: On-Going

Objective 1C.5: Perform comprehensive loss estimate calculations.

Project 1C.5.1: Obtain current property value estimates from the Brooke County Assessor.

Status: Complete

Project 1C.5.2: Create geospatial databases that can be used to calculate an accurate loss estimate for future revisions of this plan.

Status: Deferred

Project 1C.5.3: Generate property value estimates from non-residential (commercial, governmental, etc.) structures in the county.

Status: Complete

Project 1C.5.4: With obtained data from above, provide losses for each specific hazard.

Status: On-Going

Objective 1C.6: Update critical facilities listing and mapping (see Goal 7 for mapping objectives).

Project 1C.6.1: Work with critical facilities and local entities to create revised listings of critical facilities within the county on a regular basis.

Status: On-Going

Objective 1C.7: Update asset inventory with input from various local governments and private companies.

Project 1C.7.1: Work with all stakeholders to develop comprehensive listings of all assets potentially affected by each hazard.

Status: On-Going

Objective 1C.8: Update the capabilities assessment.

Project 1C.8.1: Obtain data to support both countywide and local mitigation plans and programs.

Status: On-Going

Project 1C.8.2: Reassess the rating system provided and update, if needed.

Status: On-Going

Goal 2C: Obtain mitigation strategies from each of the participating local governments.

Objective 2C.1: Encourage participation from each jurisdiction in Brooke County.

Status: On-Going

Objective 2C.2: Provide guidance about the preparation of mitigation plans.

Status: On-Going

Goal 3C: Develop an implementation strategy.

Objective: 3C.1: Identify responsible parties, funding sources, and cost estimates.

Project 3C.1.1: Include parties responsible for the monitoring and evaluation of mitigation and other projects in an "After-Action Review" (AAR) process to include an Improvement Plan (IP) with a schedule for implementation and completion.

Status: On-Going (Revised)

Objective: 3C.2: Develop schedule and timeframe for strategy.

Status: On-Going (Combined with Objective 3C.1)

Goal 4C: Develop a public outreach program.

Objective 4C.1: Prepare an exhaustive list of potential stakeholders.

Project 4C.1.1: Make list available to public, via email and letter.

Status: On-Going

Objective 4C.2: Hold a series of public meetings after the hazard mitigation planning committee is formed for immediate public input on the plan.

Project 4C.2.1: Encourage participation by including public notices in newspapers and involve the mass media of the area.

Status: On-Going

Objective 4C.3: Hold an additional series of public meetings yearly, after every annual evaluation from the planning committee.

Status: On-Going (Combined with Objectives 4C.1 and 4C.2)

Goal 5C: Improve upon the protection of citizens of Brooke County from all natural and man-made hazards.

Objective 5C.1: Develop and distribute public awareness materials about natural hazard risks, preparedness, and mitigation.

Project 5C.1.1: Create displays for use at public events (health fair, public awareness day, county fair, etc.).

Status: Completed (On-Going)

Project 5C.1.2: Create materials that are targeted towards tourist population.

Status: On-Going

Project 5C.1.3: Utilize the media for the distribution and publication of hazard information.

Status: On-Going

Project 5C.1.4: Create a public speaking series on hazard-related topics.

Status: On-Going

Project 5C.1.5: Ensure that the American Red Cross "citizens' disaster course" is held on a frequent basis.

Status: Deleted

Project 5C.1.6: Work with Brooke County Schools to promote hazard mitigation education and awareness and discuss ways to better integrate mitigation into the curriculum.

Status: On-Going

Project 5C.1.7: Work with non-governmental organizations (youth, service, professional, religious, etc.) to promote mitigation education and awareness.

Status: On-Going

Project 5C.1.8: Develop an Emergency Public Information (EPI) program that will provide critical information to the general public in the event of an emergency, particularly as it relates to flooding.

Status: On-Going

Objective 5C.2: Target owners of properties within identified hazard areas for additional outreach regarding mitigation and disaster preparedness.

Project 5C.2.1: Distribute letters to all property owners in the county regarding potential flood hazards as required for participation in the Community Rating System (CRS).

Status: Deferred

Project 5C.2.2: Hold a local course on the National Flood Insurance Program (NFIP) for realtors, bankers, insurance professionals, and homeowners.

Status: Deferred

Project 5C.2.3: Make the most current Flood Insurance Rate Map (FIRM) data and information available to the general public on an open and accessible basis.

Status: Completed

Objective 5C.3: Evaluate existing shelters to determine adequacy for current and future populations.

Project 5C.3.1: Ensure that all shelters have adequate emergency power resources.

Status: On-Going

Project 5C.3.2: Develop adequate emergency shelter and evacuation plans for animals (domestic pets, livestock, and wildlife).

Status: On-Going

Objective 5C.4: Ensure adequate training and resources for emergency organizations and personnel.

Project 5C.4.1: Teach Community Emergency Response Team classes in Brooke County.

Status: Completed

Project 5C.4.2: Increase the number of trained citizen emergency responders.

Status: Completed

Project 5C.4.3: Conduct annual tabletop disaster exercises with local law enforcement, emergency managers, city and county officials, and other disaster response agencies.

Status: On-Going

Project 5C.4.4: Provide information about local, regional, state, and federal training opportunities to fire departments, Emergency Medical Services (EMS), ambulance services, and other emergency responders.

Status: On-Going

Goal 6C: Reduce the current and future risks from hazards in Brooke County.

Objective 6C.1: Evaluate and update existing floodplain ordinances to meet or exceed the NFIP standards.

Project 6C.1.1: Work with the municipalities to update all floodplain ordinances adopted prior to 1987.

Status: Completed

Project 6C.1.2: Secure additional training and education for local land use planners, zoning administrators, and related officials for proper floodplain management techniques and other flood prevention activities.

Status: On-Going

Objective 6C.2: Improve the enforcement of existing floodplain regulations.

Project 6C.2.1: Provide additional training to county and municipal development officials on NFIP requirements.

Status: On-Going

Objective 6C.3: Encourage the passage of new regulations to alleviate future property damage.

Project 6C.3.1: Encourage all local governments to adopt and enforce building codes and other regulations which require new construction activities to conform to applicable snow load specifications.

Status: On-Going

Goal 7C: Improve emergency preparedness in Brooke County and its incorporated municipalities by implementing comprehensive emergency management activities.

Objective: 7C.1: Improve coordination and communication among disaster response organizations, local, and county governments.

Project 7C.1.1: Utilize the Brooke County Emergency Management Agency (BCEMA) to facilitate communication and coordination between emergency teams in the county.

Status: Completed (On-Going)

Objective 7C.2: Regularly update the Emergency Operations Plan (EOP) for Brooke County.

Project 7C.2.1: Redefine roles, responsibilities, and tasks of emergency response agencies and other tasked organizations, if needed.

Status: On-Going

Objective 7C.3: Continue training efforts in emergency response.

Project 7C.3.1: Conduct drills, exercises, and other training events to ensure that the county's emergency response forces are property trained for hazard events.

Status: Completed (On-Going)

Goal 8C: Reduce the potential impact of natural and man-made disasters on private property.

Objective 8C.1: Encourage participation in the National Flood Insurance Program.

Project 8C.1.1: All local units of government will continue to maintain their membership in the NFIP.

Status: Combined with Objective 6C.1

Project 8C.1.2: Obtain updated information on the number of NFIP policyholders in Brooke County and its municipalities.

Status: Combined with Objective 6C.1

Project 8C.1.3: Conduct outreach efforts to educate the public about the NFIP and its requirements.

Status: Combined with Objective 6C.1

Objective 8C.2: Identify all repetitive loss structures throughout the county.

Project 8C.2.1: Collect updated information of the number and location of all repetitive loss properties throughout the county and the municipalities.

Status: Completed

Project 8C.2.2: Develop a database of information on all repetitive loss properties including maps.

Status: Completed

Project 8C.2.3: Identify owners of repetitive loss properties that may be willing to participate in future property acquisition and relocation projects.

Status: On-Going

Goal 9C: Develop better hazard data for Brooke County and the municipalities.

Objective 9C.1: Update flood hazard mapping.

Project 9C.1.1: Work with the Federal Emergency Management Agency (FEMA) and West Virginia Division of Homeland Security and Emergency Management (WVDHSEM) on the Map Modernization Program to improve FIRMs.

Status: Completed

Project 9C.1.2: Local planning organizations should delineate the 100-year (base) floodplain on all planning and zoning maps.

Status: Completed

Objective 9C.2: Assess vulnerability of transportation systems and assets located in hazard areas.

Project 9C.2.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Status: On-Going

Project 9C.2.2: Contact commercial rail lines to ensure that measures are being taken to address hazard risks.

Status: On-Going (Revised)

Objective 9C.3: Conduct a hazardous materials survey to better understand the nature and extent of hazardous materials risks throughout the county.

Project 9C.3.1: Identify strategies to mitigate risks from the transportation and/or storage of hazardous materials in Brooke County.

Status: On-Going

Objective 9C.4: Maintain and update comprehensive inventory of critical facilities and identify those that are subject to either damage or isolation during hazard events.

Project 9C.4.1: Work with local critical facilities to ensure they develop and maintain response plans that are compatible with the county's EOP.

Status: On-Going

Objective 9C.5: Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in these hazard-prone areas.

Project 9C.5.1: Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from development.

Status: Deferred

Objective 9C.6: Provide assessment of dam failure for each dam in Brooke County.

Project 9C.6.1: Project extent of damage of fall-out areas that would be affected by such a catastrophe.

Status: On-Going

Objective 9C.7: Prepare comprehensive listing of special needs populations in Brooke County.

Status: On-Going

Goal 10C: Reduce flood damages to flood-prone properties and protect the safety of people by encouraging the implementation of flood protection activities.

Objective 10C.1: Identify and map all areas and structures located within the 100-year floodplain according to the most recent FIRM data.

Project 10C.1.1: Identify specific structures that are prime subjects for either acquisition or relocation.

Status: Deferred

Project 10C.1.2: Segregate all such properties between commercial, residential, industrial, agricultural, recreational, and other uses.

Status: Deferred

Project 10C.1.3: Identify the most appropriate mitigation strategy for each segregated property: acquisition, relocation, or no action.

Status: On-Going

Project 10C.1.4: Provide mapping and pertinent information/maps to appropriate units of local government.

Status: On-Going

Project 10C.1.5: Develop cost estimates and project budgets for all of the identified properties and the selected strategies.

Status: On-Going

Project 10C.1.6: Prioritize all acquisition and/or relocation mitigation projects for implementation.

Status: On-Going

Objective 10C.2: Include agencies and organizations that are responsible for life-line systems, such as highways, street departments, and public utilities in hazard mitigation planning activities.

Project 10C.2.1: Ensure all lifeline agencies or departments have a comprehensive understanding of flood hazard risks and are coordinating efforts with other flood mitigation activities.

Status: On-Going

Goal 11C: Pursue natural resource protection measures to protect the environment and its people from hazardous events.

Objective 11C.1: Encourage all units of local government to enact and enforce appropriate regulations to control erosion and sedimentation.

Status: Deleted

Objective 11C.2: Prepare local wetland and identification maps using information from the National Wetlands Inventory.

Project 11C.2.1: Integrate data into Brooke County's Wetland Inventory.

Status: Deleted

CHESTER, CITY OF

Goal 1D: Keep floodwaters out of the City of Chester.

Objective 1D.1: Encourage participation in the NFIP.

Project 1D.1.1: Determine if citizens are eligible for flood insurance and ensure participation.

Status: On-Going

Project 1D.1.2: Consider the acquisition, elevation, or relocation of flood-prone properties as funding is available.

Status: New

FOLLANSBEE, CITY OF

Goal 1E: Review and comment on the *Brooke County Hazard Mitigation Plan*.

Objective 1E.1: Work with Brooke County Hazard Mitigation Planning Committee to periodically update plan.

Status: On-Going

Objective 1E.2: Provide input into mitigation goals of the county, including review of risk rankings, calculation of loss estimates, and production of critical facilities listing.

Project 1E.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Status: On-Going

Goal 2E: Improve upon the protection of the citizens of Follansbee from all natural and man-made hazards.

Objective 2E.1: Develop and distribute public awareness materials about natural hazard risks, preparedness, and mitigation.

Project 2E.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Status: On-Going

Objective 2E.2: Evaluate existing shelters to determine adequacy for current and future populations.

Project 2E.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Status: On-Going

Project 2E.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Status: On-Going

Objective 2E.3: Ensure adequate training and resources for emergency organizations and personnel.

Project 2E.3.1: Establish a Community Emergency Response Team.

Status: On-Going

Project 2E.3.2: Increase the number of trained citizen emergency responders.

Status: On-Going

Project 2E.3.3: Conduct National Weather Service Storm Spotter classes.

Status: On-Going

Goal 3E: Reduce the current and future risks from hazards in Follansbee.

Objective: 3E.1: Direct new development away from high hazard areas.

Project 3E.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Status: On-Going

Project 3E.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Status: On-Going

Project 3E.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Status: On-Going

Objective: 3E.2: Establish proper land development legislation.

Project 3E.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the city's floodplain and flood prone areas.

Status: On-Going

Project 3E.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Status: On-Going

Goal 4E: Reduce the potential impact of natural and man-made disasters on private property.

Objective 4E.1: Identify all repetitive loss structures throughout the county.

Project 4E.1.1: Collect updated information on the number and location of all repetitive loss properties throughout the city.

Status: Completed

Project 4E.1.2: Develop a database of information on all repetitive loss properties including maps.

Status: Completed

Project 4E.1.3: Identify owners of repetitive loss properties that may be willing to participate in future property acquisitions and relocation projects.

Status: Completed

Goal 5E: Develop better hazard data for Follansbee.

Objective 5E.1: Assess vulnerability of transportation systems and assets located in hazard areas.

Project 5E.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Status: On-Going

Project 5E.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the city.

Status: On-Going

Project 5E.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Status: On-Going

Goal 6E: Develop and implement a local hazard mitigation plan.

Objective 6E.1: Form a local Hazard Mitigation Planning Committee.

Project 6E.1.1: Contact local stakeholders, including the general public, for input and assistance in developing the local plan.

Status: Completed

Objective 6E.2: Distribute local plans countywide.

Status: Completed

HANCOCK COUNTY

Goal 1F: Identify strategies to mitigate the negative effects of droughts.

Objective 1F.1: Provide water to drought areas.

Project 1F.1.1: Procure water buffalos for drinking water for humans.

Status: Deleted

Project 1F.1.2: Procure water buffalos for drinking water for animals.

Status: Deleted

Project 1F.1.3: Work with local fire departments to obtain water.

Status: Completed

Project 1F.1.4: Install additional waterlines as a long-term strategy.

Status: On-Going

Objective 1F.2: Provide water to drought areas for crops.

Project 1F.2.1: Procure water buffalos for crops.

Status: Deleted

Objective 1F.3: Prevent and identify contamination of water systems.

Project 1F.3.1: Identify funding and cost associated with buying water-testing equipment.

Status: Deleted

Project 1F.3.2: Identify and work with water treatment facilities in the county to implement testing.

Status: Completed

Project 1F.3.3: Make a list of the people who may be able to assist in the prevention of contamination.

Status: Completed

Objective 1F.4: Correlate capital improvement projects for municipal water departments and Public Service Districts (PSDs).

Project 1F.4.1: Assist with funding the cost of water improvement and new construction with water lines and plants.

Status: Deleted

Project 1F.4.2: Reduce the costs of new water projects.

Status: Deleted

Project 1F.4.3: Reduce costs for the water customer.

Status: On-Going

Project 1F.4.4: Identify grants for federal funding.

Status: On-Going

Objective 1F.5: Connect water departments to allow water to be moved from one jurisdiction to another.

Project 1F.5.1: Identify funding sources to support connectivity.

Status: On-Going

Goal 2F: Reduce the loss of life and property during an earthquake by determining probability and evaluating buildings and building codes.

Objective 2F.1: Determine the probability of an earthquake.

Project 2F.1.1: Examine the effects of the earthquake in Sharon, Pennsylvania (5.2 on the Richter Scale).

Status: Completed

Project 2F.1.2: Provide public education via a handout concerning earthquake unpredictability.

Status: On-Going

Objective 2F.2: Evaluate buildings and building codes.

Project 2F.2.1: Identify critical facilities throughout the county.

Status: On-Going

Project 2F.2.2: Work with other counties and cities to look at establishing responsibilities for building codes.

Status: Deferred

Project 2F.2.3: Involve the state government in a lead agency role to draft laws to force builders to develop contractor and homeowner rules for construction.

Status: Deferred

Goal 3F: Mitigate, to the extent possible, the negative effects of flooding.

Objective: 3F.1: Reduce the potential loss of life and property due to flooding.

Project 3F.1.1: Evacuate citizens.

Status: On-Going

Project 3F.1.2: Determine if citizens are eligible for flood insurance and ensure participation.

Status: On-Going

Objective: 3F.2: Prevent an increase in the depth of floodwater.

Project 3F.2.1: Coordinate with partners to establish up-stream monitoring points.

Status: Completed

Project 3F.2.2: Conduct an engineering study to see if flood control can be placed on the Ohio River and small streams.

Status: Deferred

Project 3F.2.3: Identify funding sources for a warning system.

Status: Deferred

Project 3F.2.4: Undertake buyout and/or relocation/elevation projects to lessen the numbers of repeatedly-flooded structures in the county.

Status: New

Objective: 3F.3: Clearly identify the 100-year floodplains in Hancock County.

Project 3F.3.1: Partner with the Boy Scouts of America (BSA) to mark the 100-year floodplain.

Status: Deleted

Project 3F.3.2: Educate local developers in Hancock County through maps and flyers developed by the planning committee.

Status: Deferred

Goal 4F: Lessen the negative effects of land subsidence.

Objective 4F.1: Prevent landslides.

Project 4F.1.1: Develop long-term funding for a new road versus road maintenance. For example, in a 12-month period, Hancock County could spend $100,000 a month cleaning up landslides ($1M annually in road maintenance vs. a new road at $3M). In three (3) years time, Hancock County could spend the same amount of money and solve the problem.

Status: Deferred

Project 4F.1.2: In the short-term, identify ways to re-open roadways after a landslide as quickly as possible.

Status: Deferred

Project 4F.1.3: Collect additional information on loggers, including having them post a cash bond.

Status: Deleted

Project 4F.1.4: Solicit on-going input from the WV Department of Natural Resources (WVDNR) so that after the loggers start a project, if a problem comes up (e.g., water runoff causing road damage), someone may be able to fix the problem before the trees are cut or sold off.

Status: Deferred

Project 4F.1.5: Access the WVDHSEM or WVDOH funding and/or plans.

Status: Deferred

Project 4F.1.6: Identify water paths based on the rain water table.

Status: Deferred

Project 4F.1.7: Plant vegetation and trees in areas that are prone to landslide problems.

Status: Deleted

Project 4F.1.8: Construct steel barricades to prevent landslides.

Status: Deferred

Project 4F.1.9: New road and paving projects need to be correlated between the WVDOH and WVDNR.

Status: Deferred

Objective 4F.3: Develop a map of detours to use in case of an emergency and inform the public of the alternate routes.

Project 4F.3.1: Work with the WVDOH to install signs on roadways.

Status: On-Going

Project 4F.3.2: Use law enforcement to alleviate the problem on roadway “pinch points”.

Status: On-Going

Goal 5F: Reduce losses from winter storms.

Objective 5F.1: Institute policies to protect life and property when telephones are out of service.

Project 5F.1.1: Pre-establish points in the county where people can go to get help. Conduct public education and awareness to make sure people have that information available to them.

Status: On-Going

Project 5F.1.2: Estimate cost for a mobile command unit.

Status: Completed

Project 5F.1.3: Identify funding for necessary equipment.

Status: On-Going

Objective 5F.2: Reduce injuries and property damage to the public during winter storms.

Project 5F.2.1: Examine traffic studies that have already been completed to identify if there is a section of roadway that has more snow and ice than any other.

Status: Deleted

Project 5F.2.2: Assess road-side hazards such as stop signs, telephone poles, sidewalks, etc.

Status: Deleted

Project 5F.2.3: Be pre-involved in planning new highways throughout the county.

Status: Deleted

Objective 5F.3: Assess road snow plow conditions (years of service, replacement, enough equipment, etc.).

Project 5F.3.1: Check with the WVDOH for projected replacement of snow plow equipment.

Status: Completed

Project 5F.3.2: Upgrade communications between the WVDOH and 911.

Status: Completed

Objective 5F.4: Evaluate and update shelters in the county.

Project 5F.4.1: Update shelters with pet rooms and power heat operated on emergency power systems.

Status: Completed

Goal 6F: Mitigate the negative effects of severe wind and/or tornados.

Objective 6F.1: Educate and provide early warning to the public.

Project 6F.1.1: Evaluate if additional publications beyond the "Getting Ready" booklet is necessary.

Status: On-Going

Project 6F.1.2: Request an inventory list of the power plant's equipment and available human resources.

Status: Deferred

Project 6F.1.3: Update the power companies' emergency plans.

Status: Deferred

Project 6F.1.4: Identify funding for and placement of sirens and radios.

Status: Deleted

Project 6F.1.5: Designate the Hancock County Office of Emergency Management (HCOEM) as the responsible agency for sirens.

Status: Deleted

Project 6F.1.6: Utilize early warning devices, such as radios, to update citizens for early warning.

Status: Completed

Project 6F.1.7: Check electrical companies' plans and equipment. Promote the use of underground cables where possible.

Status: Deferred

Objective 6F.2: Improve construction standards to include tornado resistance.

Project 6F.2.1: Evaluate building codes and the use of different building materials, including wood frame versus brick construction, basement versus no basement, and the construction of safe rooms.

Status: Deferred

Project 6F.2.2: Ensure building inspectors are on hand to inspect buildings.

Status: Deferred

Objective 6F.3: Look at the past history of wind storms in the county.

Project 6F.3.1: Coordinate with the National Weather Service (NWS) regarding access to records of historical wind events.

Status: Deferred

Project 6F.3.2: Mon Power has information available for first responders and the public on problems with high winds.

Status: Deferred

Goal 7F: Reduce losses from wildfires.

Objective: 7F.1: Prevent wildfires.

Project 7F.1.1: Examine wildfires as a weather-related condition.

Status: On-Going

Project 7F.1.2: Provide public information about campfires.

Status: On-Going

Project 7F.1.3: Identify ways to get firefighters in wildfire areas to extinguish the fire as quickly as possible.

Status: Deferred

Objective 7F.2: Inventory wildfire equipment and replace outdated equipment.

Project 7F.2.1: The HCOEM should send out for an inventory list from the county.

Status: Completed

Project 7F.2.2: Examine human resources versus existing equipment.

Status: On-Going

Objective 7F.3: Install flags at fire departments and/or courthouses to inform the public of wildfire conditions.

Project 7F.3.1: Identify funding resources for the flags and training for the public on their use.

Status: On-Going

Objective 7F.4: Evaluate the cost of human resources required to fight wildfires.

Project 7F.4.1: Obtain records from fire departments on wildfires.

Status: Deferred

Project 7F.4.2: Study the labor saved versus the labor cost, wildlife, and livestock.

Status: Deferred

Objective 7F.5: Review the history of past wildfires in Hancock County to predict, if possible, the areas that are at risk.

Project 7F.5.1: Predict what may happen if wildfires occur in Hancock County.

Status: Deferred

Project 7F.5.2: Tomlinson Run Park Ranger will help with conditions on ground cover.

Status: Deferred

Project 7F.5.3: The NWS can help with weather coverage information regarding the amount of humidity.

Status: Deferred

Goal 8F: Undertake general mitigation projects.

Objective 8F.1: Improve assistance to special populations in Hancock County.

Project 8F.1.1: Identify funding sources to include Weirton in the "special needs card" program.

Status: Completed

Objective 8F.2: Improve loss estimation capabilities.

Project 8F.2.1: Improve mapping capabilities.

Status: Completed

Project 8F.2.2: Determine which assets are located in hazard areas.

Status: On-Going

Project 8F.2.3: Collect content and operational values for critical facilities.

Status: On-Going

Project 8F.2.4: Calculate loss estimates based on the formula provided in FEMA's "how-to" guides.

Status: On-Going

Objective 8F.3: Develop mitigation goals, objectives, and strategies that address dam failures, extreme heat, hailstorms, and technological hazards/hazardous materials.

Project 8F.3.1: Hold additional meetings of the core planning team.

Status: Completed

Project 8F.3.2: Consider the inclusion of additional agencies in future planning efforts.

Status: Completed

NEW CUMBERLAND, CITY OF

Goal 1G: Keep floodwaters out of the City of New Cumberland.

Objective 1G.1: Install a floodwall.

Project 1G.1.1: Determine if floodwalls are an acceptable strategy in West Virginia.

Status: Deleted

Project 1G.1.2: Assess the cost of building floodwalls.

Status: Deleted

Objective 1G.2: Remove homes from the flood area through "buy outs", elevations, or relocations. Get critical facilities out of hazard areas.

Project 1G.2.1: Secure funding for "buy outs" (i.e., acquisition) and consider elevations or identify a relocation site.

Status: On-Going

Project 1G.2.2: Fire department personnel and city government needs to move to other areas, as State Route (SR) 2 becomes blocked with high water. Fire department and ambulances currently have a hard time reaching victims.

Status: On-Going

Objective 1G.3: Identify an evacuation route out of New Cumberland.

Project 1G.3.1: Explore potential cost sharing between departments for floodplain relocation and the relocation of houses due to the construction of a four (4)-lane highway.

Status: Deferred

Project 1G.3.2: Map and identify evacuation routes and develop maps to detour traffic around the flooded area.

Status: Completed

WEIRTON, CITY OF

Goal 1H: Review and comment on the *Brooke County Hazard Mitigation Plan*.

Objective 1H.1: Work with Brooke County Hazard Mitigation Planning Committee to periodically update plan.

Status: On-Going

Objective 1H.2: Provide input into mitigation goals of the county, including review of risk rankings, calculation of loss estimates, and production of critical facilities listing.

Project 1H.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Status: On-Going

Goal 2H: Improve upon the protection of the citizens of Weirton from all natural and man-made hazards.

Objective 2H.1: Develop and distribute public awareness materials about natural hazard risks, preparedness, and mitigation.

Project 2H.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Status: On-Going

Objective 2H.2: Evaluate existing shelters to determine adequacy for current and future populations.

Project 2H.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Status: On-Going

Project 2H.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Status: On-Going

Objective 2H.3: Ensure adequate training and resources for emergency organizations and personnel.

Project 2H.3.1: Establish a Community Emergency Response Team.

Status: On-Going

Project 2H.3.2: Increase the number of trained citizen emergency responders.

Status: On-Going

Project 2H.3.3: Conduct National Weather Service Storm Spotter classes.

Status: On-Going

Goal 3H: Reduce the current and future risks from hazards in Weirton.

Objective: 3H.1: Direct new development away from high hazard areas.

Project 3H.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Status: On-Going

Project 3H.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Status: On-Going

Project 3H.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Status: On-Going

Objective: 3H.2: Establish proper land development legislation.

Project 3H.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the city's floodplain and flood prone areas.

Status: On-Going

Project 3H.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Status: On-Going

Goal 4H: Reduce the potential impact of natural and man-made disasters on private property.

Objective 4H.1: Identify all repetitive loss structures throughout the county.

Project 4H.1.1: Collect updated information on the number and location of all repetitive loss properties throughout the city.

Status: Completed

Project 4H.1.2: Develop a database of information on all repetitive loss properties including maps.

Status: On-Going

Project 4H.1.3: Identify owners of repetitive loss properties that may be willing to participate in future property acquisitions and relocation projects.

Status: Completed

Project 4H.1.4: Undertake buyout and/or relocation/elevation projects to lessen the number of repetitive loss properties in the city.

Status: New

Goal 5H: Develop better hazard data for Weirton.

Objective 5H.1: Assess vulnerability of transportation systems and assets located in hazard areas.

Project 5H.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Status: On-Going

Project 5H.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the city.

Status: On-Going

Project 5H.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Status: On-Going

Goal 6H: Develop and implement a local hazard mitigation plan.

Objective 6H.1: Form a local Hazard Mitigation Planning Committee.

Project 6H.1.1: Contact local stakeholders, including the general public, for input and assistance in developing the local plan.

Status: Completed

Objective 6H.2: Distribute local plans countywide.

Status: Completed

WELLSBURG, CITY OF

Goal 1I: Review and comment on the *Brooke County Hazard Mitigation Plan*.

Objective 1I.1: Work with Brooke County Hazard Mitigation Planning Committee to periodically update plan.

Status: On-Going

Objective 1I.2: Provide input into mitigation goals of the county, including review of risk rankings, calculation of loss estimates, and production of critical facilities listing.

Project 1I.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Status: On-Going

Goal 2I: Improve upon the protection of the citizens of Wellsburg from all natural and man-made hazards.

Objective 2I.1: Develop and distribute public awareness materials about natural hazard risks, preparedness, and mitigation.

Project 2I.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Status: On-Going

Objective 2I.2: Evaluate existing shelters to determine adequacy for current and future populations.

Project 2I.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Status: On-Going

Project 2I.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Status: On-Going

Objective 2I.3: Ensure adequate training and resources for emergency organizations and personnel.

Project 2I.3.1: Establish a Community Emergency Response Team.

Status: On-Going

Project 2I.3.2: Increase the number of trained citizen emergency responders.

Status: On-Going

Project 2I.3.3: Conduct National Weather Service Storm Spotter classes.

Status: On-Going

Goal 3I: Reduce the current and future risks from hazards in Wellsburg.

Objective: 3I.1: Direct new development away from high hazard areas.

Project 3I.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Status: On-Going

Project 3I.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Status: On-Going

Project 3I.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Status: On-Going

Objective: 3I.2: Establish proper land development legislation.

Project 3I.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the county's floodplain and flood prone areas.

Status: On-Going

Project 3I.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Status: On-Going

Goal 4I: Reduce the potential impact of natural and man-made disasters on private property.

Objective 4I.1: Identify all repetitive loss structures throughout the county.

Project 4I.1.1: Collect updated information on the number and location of all repetitive loss properties throughout the town.

Status: Completed

Project 4I.1.2: Develop a database of information on all repetitive loss properties including maps.

Status: On-Going

Project 4I.1.3: Identify owners of repetitive loss properties that may be willing to participate in future property acquisitions and relocation projects.

Status: Completed

Project 4I.1.4: Continue to research mitigation projects in the Kings Creek area.

Status: New

Project 4I.1.5: Complete the requirements necessary for participation in the CRS.

Status: New

Goal 5I: Develop better hazard data for Wellsburg.

Objective 5I.1: Assess vulnerability of transportation systems and assets located in hazard areas.

Project 5I.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Status: On-Going

Project 5I.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the village.

Status: On-Going

Project 5I.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Status: On-Going

Goal 6I: Develop and implement a local hazard mitigation plan.

Objective 6I.1: Form a local Hazard Mitigation Planning Committee.

Project 6I.1.1: Contact local stakeholders, including the general public, for input and assistance in developing the local plan.

Status: Completed

Objective 6I.2: Distribute local plans countywide.

Status: Completed

WINDSOR HEIGHTS, VILLAGE OF

Goal 1J: Review and comment on the *Brooke County Hazard Mitigation Plan*.

Objective 1J.1: Work with Brooke County Hazard Mitigation Planning Committee to periodically update plan.

Status: On-Going

Objective 1J.2: Provide input into mitigation goals of the county, including review of risk rankings, calculation of loss estimates, and production of critical facilities listing.

Project 1J.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Status: On-Going

Goal 2J: Improve upon the protection of the citizens of Windsor Heights from all natural and man-made hazards.

Objective 2J.1: Develop and distribute public awareness materials about natural hazard risks, preparedness, and mitigation.

Project 2J.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Status: On-Going

Objective 2J.2: Evaluate existing shelters to determine adequacy for current and future populations.

Project 2J.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Status: On-Going

Project 2J.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Status: On-Going

Objective 2J.3: Ensure adequate training and resources for emergency organizations and personnel.

Project 2J.3.1: Establish a Community Emergency Response Team.

Status: On-Going

Project 2J.3.2: Increase the number of trained citizen emergency responders.

Status: On-Going

Project 2J.3.3: Conduct National Weather Service Storm Spotter classes.

Status: On-Going

Goal 3J: Reduce the current and future risks from hazards in Windsor Heights.

Objective: 3J.1: Direct new development away from high hazard areas.

Project 3J.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Status: On-Going

Project 3J.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Status: On-Going

Project 3J.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Status: On-Going

Objective: 3J.2: Establish proper land development legislation.

Project 3J.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the village's floodplain and flood prone areas.

Status: Deleted

Project 3J.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Status: On-Going

Goal 4J: Reduce the potential impact of natural and man-made disasters on private property.

Objective 4J.1: Identify all repetitive loss structures throughout the county.

Project 4J.1.1: Collect updated information on the number and location of all repetitive loss properties throughout the village.

Status: Completed

Project 4J.1.2: Develop a database of information on all repetitive loss properties including maps.

Status: Deleted

Project 4J.1.3: Identify owners of repetitive loss properties that may be willing to participate in future property acquisitions and relocation projects.

Status: Deleted

Project 4J.1.4: Consider participation in the National Flood Insurance Program (NFIP) at the municipal level.

Status: New

Goal 5J: Develop better hazard data for Windsor Heights.

Objective 5J.1: Assess vulnerability of transportation systems and assets located in hazard areas.

Project 5J.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Status: On-Going

Project 5J.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the village.

Status: On-Going

Project 5J.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Status: On-Going

Goal 6J: Develop and implement a local hazard mitigation plan.

Objective 6J.1: Form a local Hazard Mitigation Planning Committee.

Project 6J.1.1: Contact local stakeholders, including the general public, for input and assistance in developing the local plan.

Status: Completed

Objective 6J.2: Distribute local plans countywide.

Status: Completed

3.2 IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

§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.

This portion of the plan builds on the strategies list presented in Section 3.1. Whereas Section 3.1 simply lists the mitigation goals, objectives, and strategies, this section analyzes those strategies as projects and discusses how they should be implemented. (*NOTE: "Strategies" are considered mitigation "projects".) Each strategy is listed along with a timeframe, primary coordinator, support agencies, potential funding source (and cost estimate), and its current status. Strategies are also categorized by six (6) different types of mitigation projects:

1. Prevention,
2. Property protection,
3. Natural resource protection,
4. Structural projects,
5. Emergency services, and
6. Public education and awareness.

In the development of the original plans for Brooke and Hancock Counties, projects were not grouped as per the six (6) types of mitigation projects noted above. As such, during the second planning committee meeting, attendees not only reviewed the status of projects, but also discussed the type of projects. Many, such as acquisition and elevation projects, were discussed as both "prevention" projects and "property protection" projects. Due to the ultimate goal of "removing" losses from hazard areas of those acquisition projects, committee members opted to classify them as prevention projects.

It is important to note that the cost estimates are tentative and meant as a starting point for research on project feasibility. More specifically, these cost estimates are only ranges of probable project costs; all figures are approximations. At the time the implementation of any strategy is considered, a full cost estimate should be sought prior to securing funding. The Benefit-Cost Review was emphasized in the prioritization

process. Mitigation actions were evaluated by their pros and cons, which are represented as costs and benefits.

Finally, as a navigational note, this section only contains current mitigation projects (organized by jurisdiction). If the status indicator in Section 3.1 classified as project as "Completed", "Deleted", or "Deferred", it will not be listed below (unless the Hazard Mitigation Core Planning Committee chose to re-list the project because of a future benefit). As a result (especially during future updates), the strategy numbers may not run consecutively (e.g., Strategy X.1.5 may follow Strategy X.1.3).

BROOKE-HANCOCK-JEFFERSON PLANNING COMMISSION REGIONAL AREA

Project 1.1.1: Support municipal NFIP efforts.

Timeframe:	On-going
Cost Estimate (*Funding*):	Coordination should require no additional funding (N/A)
Coordinating Agency:	County Floodplain Coordinators
Support Agencies:	Municipal Floodplain Coordinators
Mitigation Type:	Prevention
Status:	This project was added as a part of this update.

Project 1.1.2: Ensure adequate public education as well as training and education for local government officials regarding the NFIP.

Timeframe:	On-going
Cost Estimate (*Funding*):	Up to $2,500 per outreach effort for the creation of materials, renting training space, etc. (Pre Disaster Mitigation [PDM], Local Funding)
Coordinating Agency:	Local Floodplain Coordinators
Support Agencies:	N/A
Mitigation Type:	Public Education and Awareness
Status:	This project was added as a part of this update.

Project 1.1.3: Undertake buy-outs, elevation projects, and/or relocate flooded structures if and when funding is available.

Timeframe:	On-going
Cost Estimate (*Funding*):	Approximately $84,450 per purchased structure (Hazard Mitigation Grant Program [HMGP]) – NOTE: The figure was derived by averaging the median housing value for both counties.
Coordinating Agency:	Local Floodplain Coordinators
Support Agencies:	Local Government, WV Division of Homeland Security and Emergency Management (WVDHSEM), Federal Emergency Management Agency (FEMA)
Mitigation Type:	Prevention
Status:	This project was added as a part of this update.

Project 1.1.4: Continue to collect information on Repetitive Loss (RL) properties (to include general areas, lowest floor elevations, etc.) to aid in possible future implementation of the projects as well as in refining a strategy for addressing RL areas in future versions of this plan.

Timeframe:	On-going
Cost Estimate (*Funding*):	Collecting information on properties – based on the RL information included in this version of the plan – should not require significant additional funding (N/A)
Coordinating Agency:	Local Floodplain Coordinators
Support Agencies:	WVDHSEM
Mitigation Type:	Prevention
Status:	This project was added as a part of this update.

Project 2.1.1: Prepare public information campaigns regarding risks and family preparedness for such hazards as thunderstorms, high winds, hailstorms, earthquakes, and winter storms.

Timeframe:	On-going
Cost Estimate (*Funding*):	Up to $2,500 per campaign (PDM, Emergency Management Performance Grant [EMPG], Hazardous Materials Emergency Planning [HMEP] Grant, State Emergency Response Commission [SERC], Local Funding)
Coordinating Agency:	County Emergency Managers
Support Agencies:	Local Emergency Planning Committees (LEPCs), Local Government
Mitigation Type:	Public Education and Awareness
Status:	This project was added as a part of this update.

Project 2.1.2: Partner with agencies throughout the region in support of mitigation and preparedness measures, to include but not be limited to the NextGen project, continued maintenance of this plan, etc.

Timeframe:	On-going
Cost Estimate (*Funding*):	Coordination should require little to no additional funding (N/A)
Coordinating Agency:	County Emergency Managers, Jurisdictional Officials
Support Agencies:	Brooke-Hancock-Jefferson Metropolitan Planning Commission (BHJ), Weirton Area Port Authority
Mitigation Type:	Public Education and Awareness
Status:	This project was added as a part of this update.

Project 2.1.3: Form a preparedness "task force" with officials from industries such as oil and natural gas exploration to determine actual risks, share findings and facts, etc.

Timeframe:	On-going
Cost Estimate (*Funding*):	Coordination should require little to no additional funding (N/A)
Coordinating Agency:	County Emergency Managers, Jurisdictional Officials
Support Agencies:	Commercial/Industrial Operators
Mitigation Type:	Emergency Services, Public Education and Awareness
Status:	This project was added as a part of this update.

Project 3.1.1: Undertake Brownfields projects to lessen on-going contamination at former industrial sites.

Timeframe:	On-going
Cost Estimate (*Funding*):	Up to $1,000,000 per site (US Environmental Protection Agency [USEPA])
Coordinating Agency:	BHJ
Support Agencies:	N/A
Mitigation Type:	Prevention
Status:	This project was added as a part of this update.

Project 4.1.1: Coordinate with partners throughout the region to identify the location of privately-owned dams as well as contact information for the owners of those structures.

Timeframe:	On-going
Cost Estimate (*Funding*):	Coordination with partner entities should require little to no additional funding (N/A)
Coordinating Agency:	County Emergency Managers
Support Agencies:	BHJ
Mitigation Type:	Public Education and Awareness
Status:	This project was added as a part of this update.

BEECH BOTTOM, VILLAGE OF

Project 1A.2.1: Work with the Brooke County Emergency Management Agency (BCEMA) and critical facilities to create revised listings of critical facilities within municipal boundaries.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Beech Bottom Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it should be done any time significant development is done in the village. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the village.

Project 2A.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 for creation and/or replenishment of informative materials (Pre-Disaster Mitigation [PDM], Emergency Management Performance Grant [EMPG], Local Funding)

Coordinating Agency: Beech Bottom Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual public outreach effort. Overall public awareness has been increased because this information has been made available. Soliciting public support has allowed such mitigation efforts as recently joining the NFIP possible.

Project 2A.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Beech Bottom Municipal Council

Support Agencies: Brooke County Emergency Management Agency
American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. Sheltering capabilities have recently been in flux as shelter lists have changed; local leaders feel it is important to supply shelters once the list is finalized.

Project 2A.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. The BCEMA shares any revised information upon receipt from the Red Cross. Having a current shelter inventory benefits mitigation, preparedness, and response.

Project 2A.3.1: Establish a Community Emergency Response Team (CERT).

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (US Department of Homeland Security [USDHS])

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Beech Bottom Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2A.3.2: Increase the number of trained citizen emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Beech Bottom Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2A.3.3: Conduct National Weather Service (NWS) Storm Spotter classes.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (NWS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: National Weather Service – Pittsburgh

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because the BCEMA regularly schedules Storm Spotter classes contingent on local interest. Increasing the number of storm spotters can enhance early warning capabilities, which could result in residents taking cover sooner and losing less.

Project 3A.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (N/A)

Coordinating Agency: Beech Bottom Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a regular responsibility of the village's floodplain coordinator as new development occurs. Less development in identified hazard areas lessens overall losses.

Project 3A.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Beech Bottom Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time comprehensive plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3A.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Beech Bottom Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time capital improvement plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3A.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the village's floodplain and flood prone areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (Local Funding)

Coordinating Agency: Beech Bottom Municipal Council

Support Agencies: Brooke County Floodplain Coordinator

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents an element of the county's continued National Flood Insurance Program (NFIP) compliance. Mitigation is enhanced by keeping new development from sustaining flooding losses.

Project 3A.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Beech Bottom Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 5A.1.1: Work with the West Virginia Division of Highways (WVDOH) to identify areas of frequent roadway flooding and develop mitigation strategies.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Beech Bottom Municipal Council

Support Agencies: WVDOH

Mitigation Type: Prevention

Status: This project is listed as "on-going" because local leaders frequently coordinate with appropriate agencies at the state and local levels regarding infrastructure improvements. This project continues efforts to lessen wash outs, keep the transportation infrastructure available for such emergency purposes as EMS, evacuation, etc.

Project 5A.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the village.

Timeframe: 5 years

Cost Estimate (*Funding*): Up to $10,000 for a countywide study (Hazardous Materials Emergency Planning Grant [HMEP])

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Beech Bottom Municipal Council

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it could not be completed in the original five-year planning cycle.

Project 5A.1.3: Implement the National Fire Protection Association (NFPA) 704 M System to identify all facilities that store hazardous materials.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (HMEP, Local Funding)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Facility Representatives

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual outreach effort with facilities. This project benefits mitigation because it provides local leaders with information to better characterize the types of hazmat losses that could be incurred (e.g., residential, commercial, etc.).

BETHANY, TOWN OF

Project 1B.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Bethany Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it should be done any time significant development is done in the town. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the town.

Project 2B.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 for creation and/or replenishment of informative materials (PDM, EMPG, Local Funding)

Coordinating Agency: Bethany Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual public outreach effort. Overall public awareness has been increased because this information has been made available. Soliciting public support has allowed such mitigation efforts as recently joining the NFIP possible.

Project 2B.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Bethany Municipal Council

Support Agencies: Brooke County Emergency Management Agency, American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. Sheltering capabilities have recently been in flux as shelter lists have changed; local leaders feel it is important to supply shelters once the list is finalized.

Project 2B.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. The BCEMA shares any revised information upon receipt from the Red Cross. Having a current shelter inventory benefits mitigation, preparedness, and response.

Project 2B.3.1: Establish a CERT.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Bethany Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2B.3.2: Increase the number of trained citizen emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Bethany Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2B.3.3: Conduct National Weather Service Storm Spotter classes.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (NWS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: National Weather Service – Pittsburgh

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because the BCEMA regularly schedules Storm Spotter classes contingent on local interest. Increasing the number of storm spotters can enhance early warning capabilities, which could result in residents taking cover sooner and losing less.

Project 3B.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (N/A)

Coordinating Agency: Bethany Floodplain Coordinator

Support Agencies: Bethany Municipal Council

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a regular responsibility of the town's floodplain coordinator. Less development in identified hazard areas lessens overall losses.

Project 3B.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Bethany Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time comprehensive plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3B.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Bethany Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time capital improvement plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3B.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the town's floodplain and flood prone areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (Local Funding)

Coordinating Agency: Bethany Floodplain Coordinator

Support Agencies: Brooke County Floodplain Coordinator

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents an element of the town's continued NFIP compliance. Mitigation is enhanced by keeping new development from sustaining flooding losses.

Project 3B.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Bethany Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 5B.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Bethany Municipal Council

Support Agencies: WVDOH

Mitigation Type: Prevention

Status: This project is listed as "on-going" because local leaders frequent coordinate with appropriate agencies at the state and local levels regarding infrastructure improvements. This project continues efforts to lessen wash outs, keep the transportation infrastructure available for such emergency purposes as EMS, evacuation, etc.

Project 5B.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the town.

Timeframe: 5 years

Cost Estimate (*Funding*): Up to $10,000 for a countywide study (HMEP)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Bethany Municipal Council

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it could not be completed in the original five-year planning cycle.

Project 5B.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (HMEP, Local Funding)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Facility Representatives

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual outreach effort with facilities. This project benefits mitigation because it provides local leaders with information to better characterize the types of hazmat losses that could be incurred (e.g., residential, commercial, etc.).

BROOKE COUNTY

Project 1C.1.1: Identified planning team will be involved in every aspect of the planning process, in all future endeavors.

Timeframe: On-going
Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)
Coordinating Agency: Brooke-Hancock-Jefferson Metropolitan Planning Commission (BHJ)
Support Agencies: Brooke County
Village of Beech Bottom
Town of Bethany
City of Follansbee
City of Weirton
City of Wellsburg
Village of Windsor Heights
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning.

Project 1C.2.1: Organize cooperation between the participating municipalities in Brooke County.

Timeframe: On-going
Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)
Coordinating Agency: BHJ
Support Agencies: Brooke County Emergency Management Agency
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning.

Project 1C.4.1: Review risk assessment, and update accordingly.

Timeframe: On-going
Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)
Coordinating Agency: BHJ
Support Agencies: Brooke County Emergency Management Agency
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning.

Project 1C.4.2: Review risk rankings and update accordingly.

Timeframe: On-going
Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)
Coordinating Agency: BHJ
Support Agencies: Brooke County Emergency Management Agency
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning.

Project 1C.5.4: With obtained data from above, provide losses for each specific hazard.

Timeframe: On-going
Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)
Coordinating Agency: BHJ
Support Agencies: Brooke County Emergency Management Agency
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning.

Project 1C.6.1: Work with critical facilities and local entities to create revised listings of critical facilities within the county on a regular basis.

Timeframe: On-going

Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)

Coordinating Agency: BHJ

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning.

Project 1C.7.1: Work with all stakeholders to develop comprehensive listings of all assets potentially affected by each hazard.

Timeframe: On-going

Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)

Coordinating Agency: BHJ

Support Agencies: Brooke County Emergency Management Agency
Village of Beech Bottom
Town of Bethany
City of Follansbee
City of Weirton
City of Wellsburg
Village of Windsor Heights

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the county.

Project 1C.8.1: Obtain data to support both countywide and local mitigation plans and programs.

Timeframe: On-going

Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)

Coordinating Agency: BHJ

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning.

Project 1C.8.2: Reassess the rating system provided and update, if needed.

Timeframe: On-going

Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)

Coordinating Agency: BHJ

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning. Re-assessment gives local leaders a chance to modify ratings based on shifting priorities, development, etc.

Project 3C.1.1: Include parties responsible for the monitoring and evaluation of mitigation and other projects in an "After-Action Review" (AAR) process to include an Improvement Plan (IP) with a schedule for implementation and completion.

Timeframe: On-going

Cost Estimate (*Funding*): Participation should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Emergency Preparedness Partners Throughout Brooke County

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" as per requirements from other programs funding emergency preparedness in Brooke County (e.g., EMPG). This project ensures that mitigation is an on-going process rather than one done every five (5) years and also is an effort to integrate mitigation planning into other planning mechanisms.

Project 4C.1.1: Make list available to public, via email and letter.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 per outreach campaign (PDM, EMPG, Local Funding)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: N/A

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because this type of data can be included as a part of other, regular public outreach efforts. This project is an effort to integrate mitigation into other planning efforts.

Project 4C.2.1: Encourage participation by including public notices in newspapers and involve the mass media of the area.

Timeframe: On-going

Cost Estimate (*Funding*): Encouraging participation should require little to no additional funding (Local Funding, if necessary for advertisements, etc.)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because general mitigation and risk reduction principles can be included in other, regular public outreach efforts. It serves as another effort to include mitigation in a variety of planning endeavors. It is seeks to garner more public involvement in the mitigation process.

Project 5C.1.2: Create materials that are targeted towards tourist population.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 for the creation of materials (PDM, EMPG, State Homeland Security Grant Program [SHSP], Local Funding)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Ohio Valley Business Convention and Visitors Bureau

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because efforts are typically taken based on the scheduling of significant events that are expected to bring a number of individuals into the county.

Project 5C.1.3: Utilize the media for the distribution and publication of hazard information.

Timeframe: On-going

Cost Estimate (*Funding*): Utilization of existing outreach efforts should result in little or no additional funding specifically for mitigation efforts (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because general mitigation and risk reduction principles can be included in other, regular public outreach efforts. It serves as another effort to include mitigation in a variety of planning endeavors. It is seeks to garner more public involvement in the mitigation process.

Project 5C.1.4: Create a public speaking series on hazard-related topics.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Brooke County Local Emergency Planning Committee
Bethany College
West Virginia Northern Community College

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it was not fully completed during the previous planning cycle; however, the Local Emergency Planning Committee (LEPC) has provided an outlet for general presentations on emergency preparedness. Local officials have agreed that a longer look at the structure of this project's implementation would be appropriate.

Project 5C.1.6: Work with Brooke County Schools to promote hazard mitigation education and awareness and discuss ways to better integrate mitigation into the curriculum.

Timeframe: On-going
Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)
Coordinating Agency: Brooke County Emergency Management Agency
Support Agencies: Brooke County Schools
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" in an effort to show continued cooperation between the BCEMA and Brooke County Schools. It is an effort to integrate mitigation into other regular operations.

Project 5C.1.7: Work with non-governmental organizations (youth, service, professional, religious, etc.) to promote mitigation education and awareness.

Timeframe: On-going
Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)
Coordinating Agency: Brooke County Emergency Management Agency
Support Agencies: Brooke County Local Emergency Planning Committee
Faith-Based Organization(s)/Ministerial Association(s)
Weirton Area Chamber of Commerce
Wellsburg Chamber of Commerce
West Virginia University (WVU) Extension Service (i.e., 4-H)
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" because local officials wanted to use it as a basis for the county's "whole community" approach to preparedness. It also serves as a way to get more people involved in the mitigation process and to integrate mitigation into other planning efforts.

Project 5C.1.8: Develop an Emergency Public Information (EPI) program that will provide critical information to the general public in the event of an emergency, particularly as it relates to flooding.

Timeframe: On-going

Cost Estimate (*Funding*): Development of the program has been underway and is based on partnerships throughout the Northern Panhandle (EMPG, Local Funding)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Emergency Managers Throughout the Northern Panhandle

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it is consistent with a Northern Panhandle-wide "Joint Information System (JIS)" as developed by emergency managers throughout the panhandle. The project benefits mitigation by educating residents in flood prone areas on how to help themselves.

Project 5C.3.1: Ensure that all shelters have adequate emergency power resources.

Timeframe: On-going

Cost Estimate (*Funding*): Coordinating with shelter managers should require little to no additional funding; equipping shelters, though, may necessitate funding in amounts up to $100,000 per generator (SHSP, Local Funding)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" on account of an existing, on-going effort to re-organize shelter operations with the Red Cross. Sheltering capabilities have recently been in flux as shelter lists have changed; local leaders feel it is important to supply shelters once the list is finalized.

Project 5C.3.2: Develop adequate emergency shelter and evacuation plans for animals (domestic pets, livestock, and wildlife).

Timeframe: On-going

Cost Estimate (*Funding*): Up to $50,000 is a consultant is used (SHSP, EMPG, Local Funding)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: N/A

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents a regular and periodic planning effort undertaken by the BCEMA. This project is an effort to integrate mitigation into other planning mechanisms.

Project 5C.4.3: Conduct annual tabletop disaster exercises with local law enforcement, emergency managers, city and county officials, and other disaster response agencies.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $5,000 per exercise (SHSP, EMPG, HMEP, Local Funding)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Local Emergency Services Agencies
Brooke County Local Emergency Planning Committee

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because the county is required to schedule at least four (4) emergency exercises per year as a compliance element with other funding programs. This project is an effort to integrate mitigation into other planning mechanisms. Local leaders hope that educating the public, response agencies, and others will help them better protect their own property, interests, etc. from hazard effects, thereby lessening losses. Continued training is necessary because some remain confused as to exactly what the mitigation phase of emergency management is.

Project 5C.4.4: Provide information about local, regional, state, and federal training opportunities to fire departments, Emergency Medical Services (EMS), ambulance services, and other emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Providing information should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: N/A

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because the BCEMA Director shares information from such sources as the West Virginia Division of Homeland Security and Emergency Management (WVDHSEM), USDHS, Regional Education Service Agency (RESA), etc. with response agencies as it is received. Additional training could lessen losses by educating stakeholders in how to best protect their assets.

Project 6C.1.2: Secure additional training and education for local land use planners, zoning administrators, and related officials for proper floodplain management techniques and other flood prevention activities.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (N/A)

Coordinating Agency: Brooke County Floodplain Coordinator

Support Agencies: N/A

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because refresher training is sometimes necessary. Mitigation is benefitted by a local cadre of officials with knowledge of the latest requirements, technologies, etc. to ensure that the county is attempting mitigation within the most productive, efficient ways.

Project 6C.2.1: Provide additional training to county and municipal development officials on NFIP requirements.

Timeframe: On-going
Cost Estimate (*Funding*): Unknown (N/A)
Coordinating Agency: Brooke County Floodplain Coordinator
Support Agencies: Municipal Floodplain Coordinators
WVDHSEM
FEMA
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" because refresher training is sometimes necessary. Mitigation is benefitted by a local cadre of officials with knowledge of the latest requirements, technologies, etc. to ensure that the county is attempting mitigation within the most productive, efficient ways.

Project 6C.3.1: Encourage all local governments to adopt and enforce building codes and other regulations which require new construction activities to conform to applicable snow load specifications.

Timeframe: On-going
Cost Estimate (*Funding*): Encouragement and code adoption should require little to no additional funding (N/A)
Coordinating Agency: Brooke County Planning Commission
Support Agencies: N/A
Mitigation Type: Prevention
Status: This project is listed as "on-going" because a number of agencies monitor such information throughout the county and share it upon receipt and/or when appropriate. The project benefits mitigation by ensuring that regulations are in place to lessen losses, but also benefits residents by making sure that regulations are appropriate (and not "too much").

Project 7C.1.1: Utilize the BCEMA to facilitate communication and coordination between emergency teams in the county.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: N/A

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents a current, regular effort of the BCEMA. This project also allows local leaders to keep focus on all four (4) phases of emergency management, including mitigation.

Project 7C.2.1: Redefine roles, responsibilities, and tasks of emergency response agencies and other tasked organizations, if needed.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $10,000 if a consultant is utilized for an Emergency Operations Plan (EOP) update (EMPG, SHSP, HMEP, Local Funding)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: N/A

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because the BCEMA ensures quarterly updates to the county EOP, which includes roles, responsibilities, and tasks. The EOP also addresses some mitigation issues. This project represents another effort to integrate mitigation into existing planning mechanisms.

Project 7C.3.1: Conduct drills, exercises, and other training events to ensure that the county's emergency response forces are property trained for hazard events.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $10,000 per exercise (SHSP, EMPG, HMEP, Local Funding)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Local Emergency Services Agencies
Brooke County Local Emergency Planning Committee

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because the county is required to schedule at least four (4) emergency exercises per year as a compliance element with other funding programs.

Project 8C.2.3: Identify owners of repetitive loss properties that may be willing to participate in future property acquisition and relocation projects.

Timeframe: On-going

Cost Estimate (*Funding*): Identification should require little to no additional funding as it relies on information sharing with the WVDHSEM (N/A)

Coordinating Agency: Brooke County Floodplain Coordinator

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because the county floodplain coordinator coordinates frequently with the WVDHSEM regarding NFIP compliance, to include updated repetitive loss lists. Identifying owners that would be willing to relocate lessens potential losses, thus benefitting mitigation. The project is "on-going" rather than "completed" because it is undertaken per funding availability.

Project 9C.2.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Brooke County Floodplain Coordinator
WVDOH

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a regular and periodic hazard identification effort undertaken by both the BCEMA and the WVDOH. This project continues efforts to lessen wash outs, keep the transportation infrastructure available for such emergency purposes as EMS, evacuation, etc.

Project 9C.2.2: Contact commercial rail lines to ensure that measures are being taken to address hazard risks.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents the information sharing that occurs within the membership of the LEPC. This project benefits mitigation by potentially lessening economic losses.

Project 9C.3.1: Identify strategies to mitigate risks from the transportation and/or storage of hazardous materials in Brooke County.

Timeframe: On-going

Cost Estimate (*Funding*): Costs for this strategy are incurred by the LEPC as part of its primary mission (HMEP, State Emergency Response Commission [SERC], Local Funding)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents the continual mission of the LEPC. This project is an effort to include mitigation in existing planning mechanisms. It allows local leaders to potentially remove impediments that might cause additional transportation accidents, etc.

Project 9C.4.1: Work with local critical facilities to ensure they develop and maintain response plans that are compatible with the county's EOP.

Timeframe: On-going

Cost Estimate (*Funding*): Costs for this strategy are incurred by the LEPC as part of its primary mission (HMEP, SERC, Local Funding)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Brooke County Emergency Management Agency
Facility Representatives

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents the continual mission of the LEPC. This project is another effort to integrate mitigation into other planning mechanisms.

Project 9C.6.1: Project extent of damage of fall-out areas that would be affected by such a catastrophe.

Timeframe: On-going

Cost Estimate (*Funding*): Costs for this strategy are incurred elsewhere as a part of on-going radiological planning (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Beaver Valley Nuclear Power Station
Hancock County Office of Emergency Management
WVDHSEM

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it supports a continual planning effort with the Beaver Valley Power Station. Mitigation is benefitted because it is necessary to know hazard areas before mitigation efforts can be attempted; this project also provides insight as to the type of mitigation projects that could be beneficial.

Project 10C.1.3: Identify the most appropriate mitigation strategy for each segregated property: acquisition, relocation, or no action.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $84,200 per property purchased (HMGP)

Coordinating Agency: Brooke County Floodplain Coordinator

Support Agencies: Municipal Floodplain Coordinators
WVDHSEM

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it is considered upon funding availability (i.e., no set timeframe).

Project 10C.1.4: Provide mapping and pertinent information/maps to appropriate units of local government.

Timeframe: On-going

Cost Estimate (*Funding*): Provision of maps should require little to no additional funding; ensuring that maps are developed may require funding in amounts up to $25,000 if a contractor is used (EMPG, SHSP, HMEP, Local Funding)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Brooke County Local Emergency Planning Committee
Brooke County Planning Commission

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents an information sharing initiative undertaken each time development and/or land use maps are re-done, hazard maps are re-done, etc. This project benefits mitigation by information sharing, continual implementation of NFIP goals, etc.

Project 10C.1.5: Develop cost estimates and project budgets for all of the identified properties and the selected strategies.

Timeframe: On-going

Cost Estimate (*Funding*): Development of cost estimates should require little to no additional funding (N/A)

Coordinating Agency: N/A

Support Agencies: Brooke County Emergency Management Agency
Brooke County Floodplain Coordinator
Brooke County Local Emergency Planning Committee
Brooke County Planning Commission

Mitigation Type: N/A

Status: This project is listed as "on-going" because it represents the required cyclical nature of mitigation planning.

Project 10C.1.6: Prioritize all acquisition and/or relocation mitigation projects for implementation.

Timeframe: On-going
Cost Estimate (*Funding*): Prioritization should require little to no additional funding (N/A)
Coordinating Agency: Brooke County Floodplain Coordinator
Support Agencies: Municipal Floodplain Coordinators
Mitigation Type: Prevention
Status: This project is listed as "on-going" because it is considered upon funding availability. This project allows the county to quickly take advantage of any available mitigation funding.

Project 10C.2.1: Ensure all lifeline agencies or departments have a comprehensive understanding of flood hazard risks and are coordinating efforts with other flood mitigation activities.

Timeframe: On-going
Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)
Coordinating Agency: Brooke County Floodplain Coordinator
Support Agencies: Brooke County Emergency Management Agency
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" because it represents an element of the county's continued NFIP compliance.

CHESTER, CITY OF

Project 1D.1.1: Determine if citizens are eligible for flood insurance and ensure participation.

Timeframe: On-going

Cost Estimate (*Funding*): Monitoring eligibility for flood insurance is an existing duty for the floodplain coordinator and, thus, already a part of a regular budget; this project should require little to no additional funding (N/A)

Coordinating Agency: Chester Floodplain Coordinator

Support Agencies: Hancock County Floodplain Coordinator

Mitigation Type: Public Education and Awareness

Status: This project is on-going as a part of the city's NFIP compliance.

Project 1D.1.2: Consider the acquisition, elevation, or relocation of flood-prone properties as funding is available.

Timeframe: On-going

Cost Estimate (*Funding*): Consideration of projects should require little to no funding; undertaking projects, though, could cost up to $85,300 (HMGP)

Coordinating Agency: Chester City Council

Support Agencies: Hancock County Floodplain Coordinator

Mitigation Type: Prevention

Status: This project was added as a part of this update.

FOLLANSBEE, CITY OF

Project 1E.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Follansbee Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it should be done any time significant development is done in the city. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the city.

Project 2E.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 for creation and/or replenishment of informative materials (PDM, EMPG, Local Funding)

Coordinating Agency: Follansbee Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual public outreach effort. Overall public awareness has been increased because this information has been made available. Soliciting public support has allowed such mitigation efforts as recently joining the NFIP possible.

Project 2E.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Follansbee Municipal Council

Support Agencies: Brooke County Emergency Management Agency, American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. Sheltering capabilities have recently been in flux as shelter lists have changed; local leaders feel it is important to supply shelters once the list is finalized.

Project 2E.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. The BCEMA shares any revised information upon receipt from the Red Cross. Having a current shelter inventory benefits mitigation, preparedness, and response.

Project 2E.3.1: Establish a CERT.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Follansbee Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2E.3.2: Increase the number of trained citizen emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Follansbee Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2E.3.3: Conduct National Weather Service Storm Spotter classes.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (NWS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: National Weather Service – Pittsburgh

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because the BCEMA regularly schedules Storm Spotter classes contingent on local interest. Increasing the number of storm spotters can enhance early warning capabilities, which could result in residents taking cover sooner and losing less.

Project 3E.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (N/A)

Coordinating Agency: Follansbee Floodplain Coordinator

Support Agencies: Follansbee Municipal Council

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a regular responsibility of the city's floodplain coordinator. Less development in identified hazard areas lessens overall losses.

Project 3E.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Follansbee Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time comprehensive plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3E.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Follansbee Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time capital improvement plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3E.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the city's floodplain and flood prone areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (Local Funding)

Coordinating Agency: Follansbee Floodplain Coordinator

Support Agencies: Brooke County Floodplain Coordinator

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents an element of the city's continued NFIP compliance. Mitigation is enhanced by keeping new development from sustaining flooding losses.

Project 3E.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Follansbee Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 5E.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Follansbee Municipal Council

Support Agencies: WVDOH

Mitigation Type: Prevention

Status: This project is listed as "on-going" because local leaders frequent coordinate with appropriate agencies at the state and local levels regarding infrastructure improvements. This project continues efforts to lessen wash outs, keep the transportation infrastructure available for such emergency purposes as EMS, evacuation, etc.

Project 5E.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the city.

Timeframe: 5 years

Cost Estimate (*Funding*): Up to $10,000 for a countywide study (HMEP)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Follansbee Municipal Council

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it could not be completed in the original five-year planning cycle.

Project 5E.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (HMEP, Local Funding)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Facility Representatives

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual outreach effort with facilities. This project benefits mitigation because it provides local leaders with information to better characterize the types of hazmat losses that could be incurred (e.g., residential, commercial, etc.).

HANCOCK COUNTY

Project 1F.1.4: Install additional waterlines as a long-term strategy.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $5,000,000 contingent on size of project (Small Cities Block Grant [SCBG], WV Infrastructure and Jobs Development Council [IJDC], US Department of Agriculture [USDA], Local Funding)

Coordinating Agency: BHJ

Support Agencies: Grant Public Service District (PSD)
Oakland PSD
Tomlinson PSD
City of Chester
City of New Cumberland
City of Weirton

Mitigation Type: Structural Projects

Status: This project is considered when funds become available. It benefits mitigation by strengthening capabilities against droughts. It also represents an effort to integrate mitigation into existing planning efforts.

Project 1F.4.3: Reduce costs for the water customer.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (N/A)

Coordinating Agency: Grant PSD
Oakland PSD
Tomlinson PSD
City of Chester
City of New Cumberland
City of Weirton

Support Agencies: N/A

Mitigation Type: N/A

Status: This project is listed as “on-going” because it represents a continual effort of the agencies providing public water service.

Project 1F.4.4: Identify grants for federal funding.

Timeframe: On-going

Cost Estimate (*Funding*): Identification of potential funding sources should require little to no additional funding (N/A)

Coordinating Agency: BHJ

Support Agencies: N/A

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a part of the Region 11 Planning and Development Council's (PDC's) mission. The project benefits mitigation because mitigation grants can be identified.

Project 1F.5.1: Identify funding sources to support connectivity.

Timeframe: On-going

Cost Estimate (*Funding*): Identification of potential funding sources should require little to no additional funding (N/A)

Coordinating Agency: BHJ

Support Agencies: Grant PSD
Oakland PSD
Tomlinson PSD
City of Chester
City of New Cumberland
City of Weirton

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a part of the Region 11 PDC's mission. Connectivity benefits mitigation by ensuring continuity of water service which strengthens local capabilities for drought conditions.

Project 2F.1.2: Provide public education via a handout concerning earthquake unpredictability.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 per outreach effort (PDM, EMPG, Local Funding)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: Hancock County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a periodic outreach effort coordinated by the Hancock County Office of Emergency Management (HCOEM). The project not only integrates mitigation into the overall public information program, but it also teaches residents how to reduce losses to their assets.

Project 2F.2.1: Identify critical facilities throughout the county.

Timeframe: On-going

Cost Estimate (*Funding*): Identification of facilities should require little to no additional funding (N/A)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: Hancock County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because emergency managers monitor the ingress and egress of new assets; lists are updated accordingly upon openings and/or closures. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the county.

Project 3F.1.1: Evacuate citizens.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $10,000 if a planning contractor is used to develop an evacuation plan (EMPG, SHSP, Local Funding)

Coordinating Agency: Hancock County Office of Emergency Management Agency

Support Agencies: Local Emergency Response Agencies

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because evacuation planning is a continual process as part of the HCOEM's hazardous material, all-hazards, and radiological planning. Evacuation can lessen potential loss of life, a mitigation goal.

Project 3F.1.2: Determine if citizens are eligible for flood insurance and ensure participation.

Timeframe: On-going

Cost Estimate (*Funding*): Monitoring flood insurance issues is a regular part of the county budget; this project should require little to no additional funding (N/A)

Coordinating Agency: Hancock County Floodplain Coordinator

Support Agencies: N/A

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents an element of the county's continued NFIP compliance. It benefits mitigation by protecting property.

Project 3F.2.4: Undertake buyout and/or relocation/elevation projects to lessen the numbers of repeatedly-flooded structures in the county.

Timeframe:	On-going
Cost Estimate (*Funding*):	Up to $84,700 per property purchased (Hazard Mitigation Grant Program [HMGP])
Coordinating Agency:	Hancock County Floodplain Coordinator
Support Agencies:	Hancock County Commission Hancock County Office of Emergency Management
Mitigation Type:	Prevention
Status:	This project was added as a part of this update.

Project 4F.3.1: Work with the WVDOH to install signs on roadways.

Timeframe:	On-going
Cost Estimate (*Funding*):	Coordination should require little to no additional funding (N/A)
Coordinating Agency:	Hancock County Office of Emergency Management
Support Agencies:	WVDOH
Mitigation Type:	Public Education and Awareness
Status:	This project is listed as “on-going” because it represents a response phase effort to contact WVDOH when landslide incidents occur. Ensuring adequate traffic flow may lessen economic losses.

Project 4F.3.2: Use law enforcement to alleviate the problem on roadway "pinch points".

Timeframe: On-going

Cost Estimate (*Funding*): Emergency deployment of law enforcement should require little to no pre-emergency or mitigation funding (N/A)

Coordinating Agency: Hancock County Office of Emergency Management (as part of the resource management function)

Support Agencies: Hancock County Sheriff
Local Law Enforcement

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents a response phase effort to efficiently deploy resources. Ensuring adequate traffic flow may lessen loss of life (particularly during evacuation efforts) and/or economic losses.

Project 5F.1.1: Pre-establish points in the county where people can go to get help. Conduct public education and awareness to make sure people have that information available to them.

Timeframe: On-going

Cost Estimate (*Funding*): Identification of resource points should require little to no additional funding (N/A)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: N/A

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents a continual planning/resource identification effort of the HCOEM. This project could lessen potential loss of life as well as educate residents on how to protect their assets.

Project 5F.1.3: Identify funding for necessary equipment.

Timeframe: On-going

Cost Estimate (*Funding*): Identification of potential funding sources should require little to no additional funding (N/A)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: WVDHSEM

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an element of the HCOEM's regular mission. The purchase of equipment could result in decreased losses due to a more efficient and effective response.

Project 6F.1.1: Evaluate if publications beyond the "Getting Ready" booklet is necessary.

Timeframe: On-going

Cost Estimate (*Funding*): Evaluation should require little to no additional funding (N/A)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: Hancock County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a periodic effort to determine if existing public outreach efforts are sufficient. Mitigation can be included in outreach efforts. This project thus integrates mitigation into existing planning efforts.

Project 7F.1.1: Examine wildfires as a weather-related condition.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with subject-matter experts should require little to no additional funding (N/A)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: West Virginia Division of Forestry
West Virginia State Parks Service
USDA

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a component of the county's "whole community" approach to emergency preparedness. It helps to better define the wildfire risk, which could help in determining effective mitigation strategies, even as conditions throughout the county change.

Project 7F.1.2: Provide public information about campfires.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 per outreach effort (PDM, EMPG, Local Funding)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: Hancock County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a periodic public outreach effort. This project benefits mitigation by potentially eliminating a cause of wildfires.

Project 7F.2.2: Examine human resources versus existing equipment.

Timeframe: On-going

Cost Estimate (*Funding*): Examination and coordination should require little to no additional funding (N/A)

Coordinating Agency: N/A

Support Agencies: Local Government and Emergency Services Agency Heads

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a continual effort to ensure efficient departmental operations as well as a general resource identification effort. This project benefits mitigation by better equipping agencies to respond, possibly allowing them to resolve emergencies before significant losses are incurred.

Project 7F.3.1: Identify funding resources for the flags and training for the public on their use.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (N/A)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: West Virginia Division of Forestry
West Virginia State Parks Service
USDA

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because local officials continue to deem it beneficial and it could not be completed during the previous five (5)-year planning cycle. Public information could lessen outdoor burning during high-probability periods, thereby eliminating a potential cause of wildfires (and, by extension, the losses associated with the fires).

Project 8F.2.2: Determine which assets are located in hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $10,000 if a contractor is used (PDM, Flood Mitigation Assistance Program [FMA], EMPG, Local Funding)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: Hancock County Floodplain Coordinator
Hancock County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because hazard analysis is a continual effort that is part of the HCOEM's core mission. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the county.

Project 8F.2.3: Collect content and operational values for critical facilities.

Timeframe: On-going

Cost Estimate (*Funding*): Data collection should require little to no additional funding (N/A)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: Hancock County Floodplain Coordinator

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because data still needs be collected as asset inventory and critical facility listings change. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the county.

Project 8F.2.4: Calculate loss estimates based on the formula provided in the Federal Emergency Management Agency's (FEMA's) "how-to" guides.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $10,000 if a consultant is used (PDM, FMA, EMPG, Local Funding)

Coordinating Agency: Hancock County Office of Emergency Management

Support Agencies: Hancock County Floodplain Coordinator

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because data still needs be collected as asset inventory and critical facility listings change. Determining loss estimates can help local leaders prioritize mitigation actions.

NEW CUMBERLAND, CITY OF

Project 1G.2.1: Secure funding for "buy outs" (i.e., acquisition) and consider elevations or identify a relocation site.

Timeframe: On-going
Cost Estimate (*Funding*): Up to $84,700 per purchased property (HMGP)
Coordinating Agency: New Cumberland Floodplain Coordinator
Support Agencies: New Cumberland Municipal Council
Hancock County Floodplain Coordinator
Mitigation Type: Prevention
Status: This project is considered when HMGP funds become available. It would lead to lessening the number of potentially-impacted structures.

Project 1G.2.2: Fire department personnel and city government needs to move to other areas, as State Route (SR) 2 becomes blocked with high water. Fire department and ambulances currently have a hard time reaching victims.

Timeframe: On-going (contingent upon funding availability)
Cost Estimate (*Funding*): Staging equipment and/or identifying temporary, alternate operating facilities should require little to no additional funding (SHSP, Local Funding)
Coordinating Agency: New Cumberland Municipal Council
Support Agencies: New Cumberland Volunteer Fire Department
Hancock County Office of Emergency Management
Mitigation Type: Prevention
Status: This project is on-going from the last mitigation planning process as a suitable location has not yet been identified; implementation of the project was revised for this update to be consistent with a continuity of operations effort. This project benefits mitigation by lessening potential property losses as well as loss of life, both general mitigation goals.

WEIRTON, CITY OF

Project 1H.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Weirton Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it should be done any time significant development is done in the city. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the city.

Project 2H.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 for creation and/or replenishment of informative materials (PDM, EMPG, Local Funding)

Coordinating Agency: Weirton Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual public outreach effort. Overall public awareness has been increased because this information has been made available. Soliciting public support has allowed such mitigation efforts as recently joining the NFIP possible.

Project 2H.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Weirton Municipal Council

Support Agencies: Brooke County Emergency Management Agency, American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. Sheltering capabilities have recently been in flux as shelter lists have changed; local leaders feel it is important to supply shelters once the list is finalized.

Project 2H.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. The BCEMA shares any revised information upon receipt from the Red Cross. Having a current shelter inventory benefits mitigation, preparedness, and response.

Project 2H.3.1: Establish a CERT.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Weirton Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2H.3.2: Increase the number of trained citizen emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Weirton Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2H.3.3: Conduct National Weather Service Storm Spotter classes.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (NWS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: National Weather Service – Pittsburgh

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because the BCEMA regularly schedules Storm Spotter classes contingent on local interest. Increasing the number of storm spotters can enhance early warning capabilities, which could result in residents taking cover sooner and losing less.

Project 3H.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (N/A)

Coordinating Agency: Weirton Floodplain Coordinator

Support Agencies: Weirton Municipal Council

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a regular responsibility of the city's floodplain coordinator. Less development in identified hazard areas lessens overall losses.

Project 3H.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Weirton Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time comprehensive plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3H.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Weirton Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time capital improvement plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3H.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the city's floodplain and flood prone areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (Local Funding)

Coordinating Agency: Weirton Floodplain Coordinator

Support Agencies: Brooke County Floodplain Coordinator

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents an element of the city's continued NFIP compliance. Mitigation is enhanced by keeping new development from sustaining flooding losses.

Project 3H.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Weirton Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 4H.1.2: Develop a database of information on all repetitive loss properties including maps.

Timeframe: 5 years

Cost Estimate (*Funding*): Up to $5,000 if a contractor is used (PDM, Local Funding)

Coordinating Agency: Weirton Floodplain Coordinator

Support Agencies: Brooke County Floodplain Coordinator
Hancock County Floodplain Coordinator
WVDHSEM

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going"; the identification of repetitive loss properties was done, but creation of the database was not completed. The project benefits mitigation by helping to characterize and present hazard areas to local leaders (to support decision-making).

Project 4H.1.4: Undertake buy-out and/or relocation/elevation projects to lessen the number of repetitive loss properties in the city.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $84,700 per purchased property (HMGP)

Coordinating Agency: Weirton Floodplain Coordinator

Support Agencies: Weirton Municipal Council

Mitigation Type: Prevention

Status: This project is considered when HMGP funds become available. It would result in decreasing the number of potentially-impacted properties.

Project 5H.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Weirton Municipal Council

Support Agencies: WVDOH

Mitigation Type: Prevention

Status: This project is listed as "on-going" because local leaders frequent coordinate with appropriate agencies at the state and local levels regarding infrastructure improvements. This project continues efforts to lessen wash outs, keep the transportation infrastructure available for such emergency purposes as EMS, evacuation, etc.

Project 5H.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the city.

Timeframe: 5 years

Cost Estimate (*Funding*): Up to $10,000 for a countywide study (HMEP)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Weirton Municipal Council

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it could not be completed in the original five-year planning cycle.

Project 5H.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (HMEP, Local Funding)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Facility Representatives

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual outreach effort with facilities. This project benefits mitigation because it provides local leaders with information to better characterize the types of hazmat losses that could be incurred (e.g., residential, commercial, etc.).

WELLSBURG, CITY OF

Project 1I.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Wellsburg Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it should be done any time significant development is done in the city. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the city.

Project 2I.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 for creation and/or replenishment of informative materials (PDM, EMPG, Local Funding)

Coordinating Agency: Wellsburg Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual public outreach effort. Soliciting public support has allowed such mitigation efforts as recently joining the NFIP possible.

Project 2I.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Wellsburg Municipal Council

Support Agencies: Brooke County Emergency Management Agency, American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. Sheltering capabilities have recently been in flux as shelter lists have changed; local leaders feel it is important to supply shelters once the list is finalized.

Project 2I.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. The BCEMA shares any revised information upon receipt from the Red Cross. Having a current shelter inventory benefits mitigation, preparedness, and response.

Project 2I.3.1: Establish a CERT.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Wellsburg Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2I.3.2: Increase the number of trained citizen emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Wellsburg Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2I.3.3: Conduct National Weather Service Storm Spotter classes.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (NWS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: National Weather Service – Pittsburgh

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because the BCEMA regularly schedules Storm Spotter classes contingent on local interest. Increasing the number of storm spotters can enhance early warning capabilities, which could result in residents taking cover sooner and losing less.

Project 3I.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (N/A)

Coordinating Agency: Wellsburg Floodplain Coordinator

Support Agencies: Wellsburg Municipal Council

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a regular responsibility of the city's floodplain coordinator. Less development in identified hazard areas lessens overall losses.

Project 3I.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Wellsburg Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time comprehensive plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3I.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Wellsburg Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time capital improvement plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3I.2.1: Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the city's floodplain and flood prone areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (Local Funding)

Coordinating Agency: Wellsburg Floodplain Coordinator

Support Agencies: Brooke County Floodplain Coordinator

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents an element of the city's continued NFIP compliance. Mitigation is enhanced by keeping new development from sustaining flooding losses.

Project 3I.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Wellsburg Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 4I.1.2: Develop a database of information on all repetitive loss properties including maps.

Timeframe: 5 years

Cost Estimate (*Funding*): Up to $5,000 if a contractor is used (PDM, Local Funding)

Coordinating Agency: Wellsburg Floodplain Coordinator

Support Agencies: Brooke County Floodplain Coordinator
WVDHSEM

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going"; the identification of repetitive loss properties was done, but creation of the database was not completed. The presence of a database would better organize and present data to local decision-makers as they consider mitigation projects.

Project 4I.1.4: Continue to research mitigation projects in the Kings Creek area.

Timeframe: On-going

Cost Estimate (*Funding*): Research should require little to no additional funding (N/A)

Coordinating Agency: Wellsburg Floodplain Coordinator

Support Agencies: Wellsburg Municipal Council
Brooke County Floodplain Coordinator
BCEMA

Mitigation Type: Prevention

Status: This project was added as part of this update.

Project 4I.1.5: Complete the requirements necessary for participation in the Community Rating System (CRS).

Timeframe: 5 years
Cost Estimate (*Funding*): Up to $5,000 if a consultant is used (Local Funding)
Coordinating Agency: Wellsburg Floodplain Coordinator
Support Agencies: Wellsburg Municipal Council, BCEMA
Mitigation Type: Public Education and Awareness
Status: This project was added as part of this update.

Project 5I.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Timeframe: On-going
Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)
Coordinating Agency: Wellsburg Municipal Council
Support Agencies: WVDOH
Mitigation Type: Prevention
Status: This project is listed as "on-going" because local leaders frequent coordinate with appropriate agencies at the state and local levels regarding infrastructure improvements. This project continues efforts to lessen wash outs, keep the transportation infrastructure available for such emergency purposes as EMS, evacuation, etc.

Project 5I.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the city.

Timeframe: 5 years
Cost Estimate (*Funding*): Up to $10,000 for a countywide study (HMEP)
Coordinating Agency: Brooke County Local Emergency Planning Committee
Support Agencies: Wellsburg Municipal Council
Mitigation Type: Emergency Services
Status: This project is listed as "on-going" because it could not be completed in the original five-year planning cycle.

Project 5I.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Timeframe: On-going
Cost Estimate (*Funding*): Unknown (HMEP, Local Funding)
Coordinating Agency: Brooke County Local Emergency Planning Committee
Support Agencies: Facility Representatives
Mitigation Type: Public Education and Awareness
Status: This project is listed as "on-going" because it represents a continual outreach effort with facilities. This project benefits mitigation because it provides local leaders with information to better characterize the types of hazmat losses that could be incurred (e.g., residential, commercial, etc.).

WINDSOR HEIGHTS, VILLAGE OF

Project 1J.2.1: Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Windsor Heights Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it should be done any time significant development is done in the village. It has proven helpful to local leaders to know the hazard areas in which critical facilities lie. It has also been helpful to discuss hazard areas as development has occurred in the village.

Project 2J.1.1: Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.

Timeframe: On-going

Cost Estimate (*Funding*): Up to $2,500 for creation and/or replenishment of informative materials (PDM, EMPG, Local Funding)

Coordinating Agency: Windsor Heights Municipal Council

Support Agencies: Brooke County Emergency Management Agency

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual public outreach effort. Soliciting public support has allowed such mitigation efforts as recently joining the NFIP possible.

Project 2J.2.1: Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Windsor Heights Municipal Council

Support Agencies: Brooke County Emergency Management Agency, American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. Sheltering capabilities have recently been in flux as shelter lists have changed; local leaders feel it is important to supply shelters once the list is finalized.

Project 2J.2.2: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination with the BCEMA and Red Cross should require little to no additional funding (N/A)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: American Red Cross

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it represents an on-going effort coordinated primarily by the BCEMA and Red Cross. The BCEMA shares any revised information upon receipt from the Red Cross. Having a current shelter inventory benefits mitigation, preparedness, and response.

Project 2J.3.1: Establish a CERT.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Windsor Heights Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2J.3.2: Increase the number of trained citizen emergency responders.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (USDHS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: Windsor Heights Municipal Council
Brooke County Local Emergency Planning Committee

Mitigation Type: Public Education and Awareness

Status: Brooke County emergency officials have worked diligently to establish CERT teams throughout the county; this project is listed as "on-going" because it represents a continual effort to recruit additional volunteers. CERT teams not only increase volunteer response capabilities, members can help educate their neighbors as to mitigation.

Project 2J.3.3: Conduct National Weather Service Storm Spotter classes.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (NWS)

Coordinating Agency: Brooke County Emergency Management Agency

Support Agencies: National Weather Service – Pittsburgh

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because the BCEMA regularly schedules Storm Spotter classes contingent on local interest. Increasing the number of storm spotters can enhance early warning capabilities, which could result in residents taking cover sooner and losing less.

Project 3J.1.1: Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Regulatory review should require little to no additional funding (N/A)

Coordinating Agency: Windsor Heights Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents repetitive tasks performed by the village when attracting new development to its area. Less development in identified hazard areas lessens overall losses.

Project 3J.1.2: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Windsor Heights Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time comprehensive plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3J.1.3: Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Timeframe: On-going

Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)

Coordinating Agency: Windsor Heights Municipal Council

Support Agencies: Brooke County Planning Commission

Mitigation Type: Prevention

Status: This project is listed as "on-going" because it represents a repetitive effort each time capital improvement plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 3J.2.2: Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.

Timeframe: On-going
Cost Estimate (*Funding*): Plan review should require little to no additional funding (N/A)
Coordinating Agency: Windsor Heights Municipal Council
Support Agencies: Brooke County Planning Commission
Mitigation Type: Prevention
Status: This project is listed as "on-going" because it represents a repetitive effort each time plans are updated. This project represents an effort to integrate existing planning efforts with mitigation.

Project 4J.1.4: Consider participation in the National Flood Insurance Program (NFIP) at the municipal level.

Timeframe: On-going
Cost Estimate (*Funding*): Consideration should require little to no additional funding (N/A)
Coordinating Agency: Windsor Heights Municipal Council
Support Agencies: Brooke County Floodplain Coordinator
Mitigation Type: Property Protection
Status: This project was added as a part of this update.

Project 5J.1.1: Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.

Timeframe: On-going

Cost Estimate (*Funding*): Coordination should require little to no additional funding (N/A)

Coordinating Agency: Windsor Heights Municipal Council

Support Agencies: WVDOH

Mitigation Type: Prevention

Status: This project is listed as "on-going" because local leaders frequently coordinate with appropriate agencies at the state and local levels regarding infrastructure improvements. This project continues efforts to lessen wash outs, keep the transportation infrastructure available for such emergency purposes as EMS, evacuation, etc.

Project 5J.1.2: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the village.

Timeframe: 5 years

Cost Estimate (*Funding*): Up to $10,000 for a countywide study (HMEP)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Windsor Heights Municipal Council

Mitigation Type: Emergency Services

Status: This project is listed as "on-going" because it could not be completed in the original five-year planning cycle.

Project 5J.1.3: Implement the NFPA 704 M System to identify all facilities that store hazardous materials.

Timeframe: On-going

Cost Estimate (*Funding*): Unknown (HMEP, Local Funding)

Coordinating Agency: Brooke County Local Emergency Planning Committee

Support Agencies: Facility Representatives

Mitigation Type: Public Education and Awareness

Status: This project is listed as "on-going" because it represents a continual outreach effort with facilities. This project benefits mitigation because it provides local leaders with information to better characterize the types of hazmat losses that could be incurred (e.g., residential, commercial, etc.).

3.3 IMPLEMENTATION OF MITIGATION ACTIONS

§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.

This section identifies the priority for implementing the projects identified in Sections 3.1 and 3.2. Each current project is listed with a "primary coordinator" in Section 3.2 that should be responsible for the overall implementation of the project.

Project prioritization occurred in three (3) phases. First, the region's emergency managers ranked the 14 hazards considered by this plan, with "1" being the one to which they felt the region (or their county) was most vulnerable and "14" being the hazard to which they felt the county to be least vulnerable. The hazard priorities are as follows:

1. Flooding,
2. Thunderstorms,
3. Wind,
4. Winter storms,
5. Hailstorms,
6. TIE – Drought, hazardous material incidents,
7. Land subsidence,
8. Wildfire,
9. Radiological hazards,
10. Earthquake, and
11. TIE – Civil disturbance, dam failure, and terrorism.

Second, the committee ranked the projects under each hazard by priority. Projects receiving a rank of "1" were considered to be the highest priority project for that particular hazard. The following criteria (roughly corresponding to the STAPLEE method) were used as considerations when prioritizing projects.

- **Social Impacts:** Consider whether the public would support implementation of the project. If so, priority likely rises.

- **Technical Feasibility:** Consider whether the project can be done and if it will yield the intended outcomes. If yes, priority would likely rise.
- **Administrative Requirements:** Consider the staffing, funding, and maintenance requirements of the project. If current capabilities can successfully manage and sustain the project, priority would be strengthened.
- **Political Impacts:** Consider the acceptability of the project from the political frame. If it is likely to cause political upheaval, it would receive a lower priority.
- **Legal Ramifications:** Consider whether the project can be lawfully implemented. If not, the project cannot be listed.
- **Environmental Impacts:** Consider whether there would be negative consequences to environmental assets should the project be implemented. If assets are impact, priority would be likely to fall.
- **Economic Impacts/Cost Benefit:** A brief "benefit cost review" per Federal Emergency Management Agency (FEMA) Publication 386-5: Using Benefit Cost Review in Mitigation Planning was conducted for each project to determine the "pros" and "cons" of each project as it related to project prioritization. Maximizing the use of available funds would positively affect a project's priority.

BROOKE-HANCOCK-JEFFERSON PLANNING COMMISSION REGIONAL AREA

PROJECTS *Project Number*	*Mitigation Project*	*Priority*
1.1.1	Support municipal NFIP efforts.	**1**
1.1.2	Ensure adequate public education as well as training and education for local government officials regarding the NFIP.	**1**
1.1.3	Undertake buy-outs, elevation projects, and/or relocate flooded structures if and when funding is available.	**5**
1.1.4	Continue to collect information on Repetitive Loss (RL) properties (to include general areas, lowest floor elevations, etc.) to aid in possible future implementation of the projects as well as in refining a strategy for addressing RL areas in future versions of this plan.	**4**
2.1.1	Prepare public information campaigns regarding risks and family preparedness for such hazards as thunderstorms, high winds, hailstorms, earthquakes, and winter storms.	**6**
2.1.2	Partner with agencies throughout the region in support of mitigation and preparedness measures, to include but not be limited to the NextGen project, continued maintenance of this plan, etc.	**1**

PROJECTS *Project Number*	*Mitigation Project*	*Priority*
2.1.3	Form a preparedness "task force" with officials from industries such as oil and natural gas exploration to determine actual risks, share findings and facts, etc.	**3**
3.1.1	Undertake Brownfields projects to lessen on-going contamination at former industrial sites.	**2**
4.1.1	Coordinate with partners throughout the region to identify the location of privately-owned dams as well as contact information for the owners of those structures.	**7**

BEECH BOTTOM, VILLAGE OF

PROJECTS *Project Number*	*Mitigation Project*	*Priority*
1A.2.1	Work with the Brooke County Emergency Management Agency (BCEMA) and critical facilities to create revised listings of critical facilities within municipal boundaries.	**3**
2A.1.1	Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.	**1**
2A.2.1	Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.	**7**
2A.2.2	Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.	**6**
2A.3.1	Establish a Community Emergency Response Team (CERT).	**1**
2A.3.2	Increase the number of trained citizen emergency responders.	**1**
2A.3.3	Conduct National Weather Service Storm Spotter classes.	
3A.1.1	Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.	**4**
3A.1.2	Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.	**4**
3A.1.3	Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.	**4**
3A.2.1	Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the village's floodplain and flood prone areas.	**9**
3A.2.2	Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.	**4**
5A.1.1	Work with the WV Division of Highways (WVDOH) to identify areas of frequent roadway flooding and develop mitigation strategies.	**5**
5A.1.2	Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the village.	**2**

PROJECTS *Project Number*	*Mitigation Project*	*Priority*
5A.1.3	Implement the National Fire Protection Association (NFPA) 704 M System to identify all facilities that store hazardous materials.	**8**

BETHANY, TOWN OF

PROJECTS *Project Number*	*Mitigation Project*	*Priority*
1B.2.1	Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.	**3**
2B.1.1	Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.	**1**
2B.2.1	Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.	**7**
2B.2.2	Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.	**6**
2B.3.1	Establish a CERT.	**1**
2B.3.2	Increase the number of trained citizen emergency responders.	**1**
2B.3.3	Conduct National Weather Service Storm Spotter classes.	
3B.1.1	Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.	**4**
3B.1.2	Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.	**4**
3B.1.3	Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.	**4**
3B.2.1	Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the town's floodplain and flood prone areas.	**9**
3B.2.2	Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.	**4**
5B.1.1	Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.	**5**
5B.1.2	Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the town.	**2**
5B.1.3	Implement the NFPA 704 M System to identify all facilities that store hazardous materials.	**8**

BROOKE COUNTY

MITIGATION PLANNING PROJECTS		
Project Number	*Mitigation Project*	*Priority*
1C.1.1	Identified planning team will be involved in every aspect of the planning process, in all future endeavors.	**1**
1C.2.1	Organize cooperation between the participating municipalities in Brooke County.	**2**
1C.4.1	Review risk assessment, and update accordingly.	**3**
1C.4.2	Review risk rankings and update accordingly.	**4**
1C.5.4	With obtained data from above, provide losses for each specific hazard.	**5**
1C.6.1	Work with critical facilities and local entities to create revised listings of critical facilities within the county on a regular basis.	**6**
1C.7.1	Work with all stakeholders to develop comprehensive listings of all assets potentially affected by each hazard.	**7**
1C.8.1	Obtain data to support both countywide and local mitigation plans and programs.	**8**
1C.8.2	Reassess the rating system provided and update, if needed.	**9**
IMPLEMENTATION PROJECTS		
Project Number	*Mitigation Project*	*Priority*
3C.1.1	Include parties responsible for the monitoring and evaluation of mitigation and other projects in an "After-Action Review" (AAR) process to include an Improvement Plan (IP) with a schedule for implementation and completion.	**1**
PUBLIC OUTREACH PROJECTS		
Project Number	*Mitigation Project*	*Priority*
4C.1.1	Make list available to public, via email and letter.	**1**
4C.2.1	Encourage participation by including public notices in newspapers and involve the mass media of the area.	**2**
MAN-MADE HAZARD MITIGATION PROJECTS		
Project Number	*Mitigation Project*	*Priority*
5C.1.2	Create materials that are targeted towards tourist population.	**9**
5C.1.3	Utilize the media for the distribution and publication of hazard information.	**4**
5C.1.4	Create a public speaking series on hazard-related topics.	**5**
5C.1.6	Work with Brooke County Schools to promote hazard mitigation education and awareness and discuss ways to better integrate mitigation into the curriculum.	**6**
5C.1.7	Work with non-governmental organizations (youth, service, professional, religious, etc.) to promote mitigation education and awareness.	**7**

5C.1.8	Develop an Emergency Public Information (EPI) program that will provide critical information to the general public in the event of an emergency, particularly as it relates to flooding.	**3**
5C.3.1	Ensure that all shelters have adequate emergency power resources.	**1**
5C.3.2	Develop adequate emergency shelter and evacuation plans for animals (domestic pets, livestock, and wildlife).	**2**
5C.4.3	Conduct annual tabletop disaster exercises with local law enforcement, emergency managers, city and county officials, and other disaster response agencies.	**8**
5C.4.4	Provide information about local, regional, state, and federal training opportunities to fire departments, Emergency Medical Services (EMS), ambulance services, and other emergency responders.	**10**
RISK REDUCTION PROJECTS		
Project Number	*Mitigation Project*	*Priority*
6C.1.2	Secure additional training and education for local land use planners, zoning administrators, and related officials for proper floodplain management techniques and other flood prevention activities.	**3**
6C.2.1	Provide additional training to county and municipal development officials on National Flood Insurance Program (NFIP) requirements.	**2**
6C.3.1	Encourage all local governments to adopt and enforce building codes and other regulations which require new construction activities to conform to applicable snow load specifications.	**1**
COMPREHENSIVE EMERGENCY MANAGEMENT PROJECTS		
Project Number	*Mitigation Project*	*Priority*
7C.1.1	Utilize the BCEMA to facilitate communication and coordination between emergency teams in the county.	**1**
7C.2.1	Redefine roles, responsibilities, and tasks of emergency response agencies and other tasked organizations, if needed.	**3**
7C.3.1	Conduct drills, exercises, and other training events to ensure that the county's emergency response forces are property trained for hazard events.	**2**
NATURAL HAZARD MITIGATION PROJECTS		
Project Number	*Mitigation Project*	*Priority*
8C.2.3	Identify owners of repetitive loss properties that may be willing to participate in future property acquisition and relocation projects.	**1**
DATA DEVELOPMENT PROJECTS		
Project Number	*Mitigation Project*	*Priority*
9C.2.1	Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.	**3**
9C.2.2	Contact commercial rail lines to ensure that measures are being taken to address hazard risks.	**4**

9C.3.1	Identify strategies to mitigate risks from the transportation and/or storage of hazardous materials in Brooke County.	**2**
9C.4.1	Work with local critical facilities to ensure they develop and maintain response plans that are compatible with the county's Emergency Operations Plan (EOP).	**1**
9C.6.4	Project extent of damage of fall-out areas that would be affected by such a catastrophe.	**5**
FLOODING PROJECTS		
Project Number	*Mitigation Project*	*Priority*
10C.1.3	Identify the most appropriate mitigation strategy for each segregated property: acquisition, relocation, or no action.	**1**
10C.1.4	Provide mapping and pertinent information/maps to appropriate units of local government.	**3**
10C.1.5	Develop cost estimates and project budgets for all of the identified properties and the selected strategies.	**4**
10C.1.6	Prioritize all acquisition and/or relocation mitigation projects for implementation.	**5**
10C.2.1	Ensure all lifeline agencies or departments have a comprehensive understanding of flood hazard risks and are coordinating efforts with other flood mitigation activities.	**2**

CHESTER, CITY OF

PROJECTS		
Project Number	*Mitigation Project*	*Priority*
1D.1.1	Determine if citizens are eligible for flood insurance and ensure participation.	**1**
1D.1.2	Consider the acquisition, elevation, or relocation of flood-prone properties as funding is available.	**2**

FOLLANSBEE, CITY OF

PROJECTS		
Project Number	*Mitigation Project*	*Priority*
1E.2.1	Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.	**3**
2E.1.1	Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.	**1**
2E.2.1	Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.	**7**
2E.2.2	Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.	**6**
2E.3.1	Establish a CERT.	**1**

PROJECTS		
Project Number	*Mitigation Project*	*Priority*
2E.3.2	Increase the number of trained citizen emergency responders.	**1**
2E.3.3	Conduct National Weather Service Storm Spotter classes.	
3E.1.1	Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.	**4**
3E.1.2	Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.	**4**
3E.1.3	Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.	**4**
3E.2.1	Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the city's floodplain and flood prone areas.	**9**
3E.2.2	Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.	**4**
5E.1.1	Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.	**5**
5E.1.2	Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the city.	**2**
5E.1.3	Implement the NFPA 704 M System to identify all facilities that store hazardous materials.	**8**

HANCOCK COUNTY

DROUGHT PROJECTS		
Project Number	*Mitigation Project*	*Priority*
1F.1.4	Install additional waterlines as a long-term strategy.	**1**
1F.4.3	Reduce costs for the water customer.	**4**
1F.4.4	Identify grants for federal funding.	**3**
1F.5.1	Identify funding sources to support connectivity.	**2**
EARTHQUAKE PROJECTS		
Project Number	*Mitigation Project*	*Priority*
2F.1.2	Provide public education via a handout concerning earthquake unpredictability.	**1**
2F.2.1	Identify critical facilities throughout the county.	**2**
FLOODING PROJECTS		
Project Number	*Mitigation Project*	*Priority*
3F.1.1	Evacuate citizens.	**1**
3F.1.2	Determine if citizens are eligible for flood insurance and ensure participation.	**2**

3F.2.4	Undertake buyout and/or relocation/elevation projects to lessen the numbers of repeatedly-flooded structures in the county.	**3**
LAND SUBSIDENCE PROJECTS		
Project Number	*Mitigation Project*	*Priority*
4F.3.1	Work with the WVDOH to install signs on roadways.	**1**
4F.3.2	Use law enforcement to alleviate the problem on roadway "pinch points".	**2**
WINTER STORM PROJECTS		
Project Number	*Mitigation Project*	*Priority*
5F.1.1	Pre-establish points in the county where people can go to get help. Conduct public education and awareness to make sure people have that information available to them.	**1**
5F.1.3	Identify funding for necessary equipment.	**2**
WIND PROJECTS		
Project Number	*Mitigation Project*	*Priority*
6F.1.1	Evaluate if additional publications beyond the "Getting Ready" booklet is necessary.	**1**
WILDFIRE PROJECTS		
Project Number	*Mitigation Project*	*Priority*
7F.1.1	Examine wildfires as a weather-related condition.	**1**
7F.1.2	Provide public information about campfires.	**2**
7F.2.2	Examine human resources versus existing equipment.	**3**
7F.3.1	Identify funding resources for the flags and training for the public on their use.	**4**
GENERAL MITIGATION PROJECTS		
Project Number	*Mitigation Project*	*Priority*
8F.2.2	Determine which assets are located in hazard areas.	**1**
8F.2.3	Collect content and operational values for critical facilities.	**2**
8F.2.4	Calculate loss estimates based on the formula provided in FEMA's "how-to" guides.	**3**

NEW CUMBERLAND, CITY OF

PROJECTS		
Project Number	*Mitigation Project*	*Priority*
1G.2.1	Secure funding for "buy outs" and identify a relocation site.	**2**
1G.2.2	Fire department personnel and city government needs to move to other areas, as State Route (SR) 2 becomes blocked with high water. Fire department and ambulances currently have a hard time reaching victims.	**1**

WEIRTON, CITY OF

PROJECTS *Project Number*	*Mitigation Project*	*Priority*
1H.2.1	Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.	**3**
2H.1.1	Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.	**1**
2H.2.1	Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.	**7**
2H.2.2	Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.	**6**
2H.3.1	Establish a CERT.	**1**
2H.3.2	Increase the number of trained citizen emergency responders.	**1**
2H.3.3	Conduct National Weather Service Storm Spotter classes.	
3H.1.1	Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.	**4**
3H.1.2	Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.	**4**
3H.1.3	Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.	**4**
3H.2.1	Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the city's floodplain and flood prone areas.	**9**
3H.2.2	Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.	**4**
4H.1.2	Develop a database of information on all repetitive loss properties including maps.	**1**
4H.1.4	Undertake buy-out and/or relocation/elevation projects to lessen the number of repetitive loss properties in the city.	**2**
5H.1.1	Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.	**5**
5H.1.2	Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the city.	**2**
5H.1.3	Implement the NFPA 704 M System to identify all facilities that store hazardous materials.	**8**

WELLSBURG, CITY OF

PROJECTS *Project Number*	*Mitigation Project*	*Priority*
1I.2.1	Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.	**3**
2I.1.1	Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.	**1**
2I.2.1	Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.	**7**
2I.2.2	Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.	**6**
2I.3.1	Establish a CERT.	**1**
2I.3.2	Increase the number of trained citizen emergency responders.	**1**
2I.3.3	Conduct National Weather Service Storm Spotter classes.	
3I.1.1	Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.	**4**
3I.1.2	Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.	**4**
3I.1.3	Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.	**4**
3I.2.1	Establish zoning districts and land use regulations that will allow only appropriate activities and uses in the city's floodplain and flood prone areas.	**9**
3I.2.2	Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.	**4**
4I.1.2	Develop a database of information on all repetitive loss properties including maps.	**3**
4I.1.4	Continue to research mitigation projects in the Kings Creek area.	**1**
4I.1.5	Complete the requirements necessary for participation in the Community Rating System (CRS).	**1**
5I.1.1	Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.	**5**
5I.1.2	Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the city.	**2**
5I.1.3	Implement the NFPA 704 M System to identify all facilities that store hazardous materials.	**8**

WINDSOR HEIGHTS, VILLAGE OF

PROJECTS *Project Number*	*Mitigation Project*	*Priority*
1J.2.1	Work with BCEMA and critical facilities to create revised listings of critical facilities within municipal boundaries.	**3**
2J.1.1	Develop an all-hazard information system in the Mayor's Office to provide public information on disasters to citizens.	**1**
2J.2.1	Ensure that all current shelters have adequate resources for use as a Mass Care Shelter.	**7**
2J.2.2	Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter, the BCEMA, and local emergency responders.	**6**
2J.3.1	Establish a CERT.	**1**
2J.3.2	Increase the number of trained citizen emergency responders.	**1**
2J.3.3	Conduct National Weather Service Storm Spotter classes.	
3J.1.1	Review existing regulations to ensure adequacy in reducing the amount of future development in identified hazard areas.	**4**
3J.1.2	Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.	**4**
3J.1.3	Review all capital improvements plans to ensure that infrastructure improvements are not directed towards hazardous areas.	**4**
3J.2.2	Review existing comprehensive plans, land use plans, and planning and zoning ordinances to determine if any revisions are necessary to better protect against hazard damage.	**4**
4J.1.4	Consider participation in the National Flood Insurance Program (NFIP) at the municipal level.	**6**
5J.1.1	Work with WVDOH to identify areas of frequent roadway flooding and develop mitigation strategies.	**5**
5J.1.2	Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous materials risks throughout the village.	**2**
5J.1.3	Implement the NFPA 704 M System to identify all facilities that store hazardous materials.	**8**

3.4 REGIONAL IMPLICATIONS

In most cases, the individual implementation of the projects listed in Sections 3.1 through 3.3 would not have a large impact on the region as a whole. There should, however, be several things kept in mind as these projects are undertaken. For example, several member governments expressed a desire to schedule regular meetings of a core hazard mitigation planning committee. Such a project should be continually re-examined to ensure the appropriate membership of the committee. Further, a number of emergency preparedness efforts are underway in other phases of emergency management (i.e., preparedness, response, and recovery). These efforts should not be undertaken separate from mitigation. For example, preparedness and response planning efforts with industry officials as well as personnel from emerging industries (such as oil and natural gas exploration) could provide valuable insight into overall hazard risk reduction surrounding their operations.

Other projects, such as public education and awareness efforts, could be accomplished through partnerships with neighboring jurisdictions. As such, individual jurisdictions could share costs and reduce duplication of effort. As can be seen by the above risk assessment, many of the communities in the region are susceptible to the same types of hazards. Such an appropriate is already underway during the response phase as the emergency managers throughout the Northern Panhandle have loosely formed a Joint Information System (JIS) aimed at supporting one another during significant emergency events.

Though this document is a plan, it calls for a number of other planning initiatives to be completed. Those initiatives should keep this process as a part of the overall planning process. In other words, community leaders should not plan for the sake of planning. This document can provide evidence as to the hazards most likely faced by the communities and planning should strengthen capabilities to lessen the effects of these types of emergencies. Further, communities should not plan in a vacuum. For example, several municipal jurisdictions (e.g., Chester, Windsor Heights, etc.) are close to county and state lines and may frequently provide emergency response assistance to the neighboring jurisdiction. In the case of Weirton, portions of the municipality are in both counties in the region. At the very least, these jurisdictions should share planning information with neighboring jurisdictions as a courtesy, but more importantly to standardize expectations and provide advance notice of how planning may impact their

jurisdictions.

Finally, community leaders should remember that large structural projects could change the topography enough to affect neighboring jurisdictions, primarily with respect to the flooding hazard. For example, a buyout or relocation project may allow water to flood newly-created green space, thus altering flooding patterns downstream and changing the location of at-risk areas. Other projects, not related to mitigation, could have the same effect. For example, the construction of a shopping plaza with large parking lots could cause run-off to back up in unexpected places, many of which had not previously been susceptible to flooding. As with planning projects, local leaders would be encouraged to share their intentions (of implementing mitigation projects) with their neighbors.

SECTION 4.0

PLAN MAINTENANCE PROCESS

As with any plan, this document must be actively maintained in order to be a viable mitigation tool for the Brooke-Hancock-Jefferson Metropolitan Planning Commission's (BHJ's) member governments. Section 4.0 outlines the general process that will be used to maintain this document.

4.0 PLAN MAINTENANCE PROCESS

§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.
§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.
§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.

The long-term success of this document depends in large part on routine monitoring, evaluating, and updating so that it will remain a valid tool for the participating communities to use. Also critical to the overall success of this strategy is the continued implementation of the local-level multi-jurisdictional mitigation projects in accordance with this document.

Formal Plan Adoption

A total of ten (10) local governments in the Northern Panhandle of West Virginia have participated in this hazard mitigation planning process. All jurisdictional levels (i.e., county and municipal) were provided opportunities for representation on the regional hazard mitigation planning committee. The BHJ coordinated the overall planning process.

This regional document has been designed to illustrate the impacts of hazards across the two (2)-county region and to highlight the benefits of a coordinated approach to hazard mitigation. The jurisdictions throughout Brooke and Hancock Counties often take a regional approach to project implementation and are well aware of its benefits. Each of the jurisdictions affected by this document formally adopted it by a resolution of their governing board.

The adoption process included the delivery of a copy of this document to the local jurisdiction, along with a sample adopting resolution. BHJ coordinated this delivery. BHJ officials explained to municipal and county leaders that this document serves as updates to the local-level mitigation plans they had adopted in 2004. Adopting resolutions were collected by the BHJ. Copies of all resolutions were scanned upon receipt and included alphabetically in Appendix 4 of this document.

The document was submitted to the West Virginia Division of Homeland Security and Emergency Management (WVDHSEM) and the Federal Emergency Management Agency (FEMA) Region III prior to the adoption process to ensure that all federal and state planning regulations had been met. Doing so prior to adoption meant two (2) things: first, the plan was initially issued an "Approved Pending Adoption" status, and secondly, the adoption process was ultimately more efficient (because re-adoptions following revisions were not necessary).

Implementation

The implementation of this plan will likely prove to be more difficult than its adoption. While this plan puts forth many worthwhile and "high" priority recommendations, there may be competition among the participating communities throughout Brooke and Hancock Counties for limited mitigation funds. The decision of which action (i.e., project) to undertake first will be the primary issue that the participating communities face. Fortunately, this plan has been designed with this issue in mind; as such, high priority actions have been included for each participating jurisdiction so each jurisdiction can pursue high-priority actions independently. Secondly, many of the jurisdictions in the region represent economically distressed areas, meaning that funding for large scale projects such as those advocated by this plan is often an issue. To ensure that mitigation efforts get underway, this document includes several low or no-cost recommendations.

An example of a low-cost, high-priority recommendation would be to pursue the education efforts necessary for elected officials and the general public as they relate to participation in the National Flood Insurance Program (NFIP). Another example of a low-cost project would be to integrate mitigation awareness into the many other pre-emergency public information campaigns that local-level emergency managers distribute on a routine basis. As an example, a variety of information on preparedness for hazardous material emergencies is frequently disseminated by

each county's Local Emergency Planning Committee (LEPC). Those efforts could be integrated into the counties' (and region's) overall mitigation strategy. Other public education efforts during such events as winter weather awareness week, etc. could equip the public with the knowledge necessary to "mitigate for themselves", which supports the concept of implementing mitigation at the lowest level possible.

Additionally, it should be noted that county emergency managers work with their counterparts in community and economic development planning to ensure that mitigation and emergency preparedness are integrated into other planning efforts, such as:

- Comprehensive planning,
- Capital improvement planning, and
- Economic development goals and incentives.

These emergency managers make risk information available to their local economic development agencies. In many cases, primarily at the municipal level, local development is monitored by the municipality. In all cases, the municipalities look to their appropriate county emergency manager for risk and hazard information. Further, the presence of BHJ can help ensure that future development does not add to the region's overall vulnerability.

The guiding principle under the implementation of this plan is that mitigation should be incorporated as much as possible into the daily actions of the coordinating agencies responsible for project implementation. During the development of the individual county plans in 2004, county mitigation planning committees attempted to align as many existing programs as possible with mitigation efforts. Such an approach was also incorporated into this document, with the added benefit of having BHJ's regional community and economic development resources as references. This approach ensures that mitigation efforts occur by default. While ensuring these efforts occur certainly helps show progress when this document is updated, it also builds buy-in for the strengthening of the community by not asking certain coordinating agencies to shoulder an entire list of new responsibilities.

It is also important to continually monitor funding opportunities that can be utilized to implement some of the larger mitigation recommendations in this document. County commissions, municipal councils, and county-level emergency managers are often the Points of Contact (POCs) for such communication.

Fortunately, emergency managers throughout the region (and West Virginia) frequently share these opportunities with colleagues. As such, a repository of funding options should be easy to maintain. It should also be noted that monitoring funding opportunities is one of BHJ's primary responsibilities. Other partner agencies, such as the Weirton Area Port Authority, also serve as a clearinghouse or POC for certain types of funding, some of which could be utilized for mitigation projects. Funding opportunities often present themselves in the aftermath of large-scale disasters, but they can also be present on a rotating cycle. The communities participating in this process have been cognizant of ranking both high and low-projects as "high priority" so that they can be in a position to take advantage of whatever funding opportunities arise.

By adopting this plan, communities served by the BHJ commit to the following:

- Pursuing the implementation of high-priority, low/no cost recommended actions,
- Keeping the concept of mitigation in the forefront of community decision-making by identifying and stressing the recommendations of the hazard mitigation plan when other community goals, plans, and activities are discussed, and
- Maintaining a constant monitoring of multi-objective, cost-share opportunities to assist the participating communities in implementing the recommended actions of this plan for which no current funding or support exists.

Integration into Existing Planning Mechanisms

As the custodial agency of the regional Hazard Mitigation Plan (HMP), the BHJ should ensure that mitigation planning is incorporated, as appropriate, into other planning mechanisms. Such a statement is not meant to say that mitigation planning should inhibit other types of planning, such as community and economic development efforts. Ensuring compatibility between these initiatives, rather, should provide an opportunity for all types of planners to understand the interplay between risk and development and the potential future vulnerabilities of fully-developed areas. Integration can open a dialogue between planners about how to responsibly plan the future of the communities throughout the region.

BHJ acts as a sort of clearinghouse for planning initiatives around its region. The regional council does not "regulate" or "supervise" these efforts, but it does maintain a central repository of efforts that are underway throughout the planning area. It maintains such documents as a Comprehensive Economic Development Strategy (CEDS), a five (5)-year economic development plan, housing and community development assessments, etc. BHJ can compare these areas highlighted for development and other projects through its documents with this mitigation plan. For instance, some traditional regional council projects, such as supporting infrastructure (e.g., water and sewer) system extensions, may support mitigation efforts for such hazards as drought and public health emergencies. These extensions may not have any effect on hazards such as flooding. Others, such as brownfields projects, may ease vulnerability to certain types of environmental hazardous material incidents. In any circumstance, BHJ may be able to use support of a mitigation effort as further justification for the funding of a project.

Additional agencies throughout the region, such as the county-level offices of emergency management, will actively integrate the information contained in this risk assessment into other planning initiatives, such as the maintenance of their jurisdiction-specific Emergency Operations Plans (EOPs). These documents should support the strengthening of capabilities to respond to the hazards identified by the risk assessment. As mitigation projects are implemented and risk is thus reduced, the emergency services community may need to "re-plan" its response to address what has become (thanks to the mitigation project) a more critical risk.

Other agencies, such as Economic Development Authorities (EDAs) serving the counties in the region maintain similar comparisons. As such, these agencies have shown an ability to actively integrate risk assessment into their existing planning efforts. As mitigation projects are implemented, risks could be reduced to the point that additional areas may be targeted for development (e.g., a buyout project could create green space for a walking trail or park).

The Weirton Area Port Authority, as another stakeholder, also supports a number of projects that could aid in mitigation and overall preparedness. For example, its "NextGen" broadband project can help alleviate potential communications failures, thus lessening potential function losses by the community's assets.

Finally, it is significant to note that all ten (10) member governments within Region 11 are represented by the BHJ itself. As the custodial agency of this document, BHJ can schedule a regular review with its member governments at one of its council meetings to ensure that local officials are educated as to the plan's contents – and in agreement with its contents – even as those officials change and this document is updated. This representation should also facilitate local government comment on both the risks facing their jurisdictions and the types and numbers of mitigation projects that could be implemented.

Maintenance

Plan maintenance requires an ongoing effort to monitor and evaluate the implementation of the plan, and to update the plan as progress, roadblocks, or changing circumstances are recognized. Both counties in the region identified their county-level emergency management office as the coordinator of local reviews. Local reviews are to occur at no less than five (5)-year intervals, with a goal of an annual review.

Also, as an example of post-disaster mitigation policies and procedures, reviews of this should occur during the recovery phase of large incidents, regardless of the time schedule. Each county's Emergency Operations Plan (EOP) contains recovery guidelines that include an assessment of how well risk and vulnerability assessments predicted affected areas. By reviewing this plan, these EOP elements can be met. Further, the emergency management/services sectors of both counties often compile After-Action Reports (AARs) as a part of post-disaster activities that include these types of assessments.

Each county identified several conceptual elements that can guide any review of this document. Those elements are as follows:

- **Ease of Implementation:** How smoothly has implementing the project (or similar types of projects) been? Have programs been readily available to assist in funding the implementation of the project (or similar types of projects)?
- **Cost Effectiveness:** Have sufficient funding sources been available to implement the project at a cost manageable by the local government? Have the costs of implementing the project been significantly less than the cumulative future costs potentially incurred by an un-corrected situation?

- **Social Impacts:** Has the public perceived that the project has positively lessened hazard-related losses? Has implementing the project adversely affected any segment of the population?
- **Political Impacts:** Has implementing a particular project (or type of project) been delayed due to the political consequences of its implementation?
- **Economic Impacts:** Has the cost/benefit ratio of implementing the project been acceptable? Has implementing a project adversely affected a particular segment of the local economy?
- **Overall Positive Impacts:** Have local leaders generally agreed that implementing a particular project was beneficial to the community?

When each county convenes for a review, it should coordinate with the BHJ to ensure that this document is updated appropriately. Public participation should be assured as the plan is updated. BHJ will ensure that a public review process *for the entire regional document* is undertaken at least once per five (5)-year period. This public review will include two (2) initiatives: publishing an advertisement in the primary newspaper in both counties that invites the public to review the existing document with a list of proposed updates (i.e., the public comment form in Appendix 4 can be used to document these comments even during future updates), and placing discussion of the plan on the agenda of one of the council's regularly-scheduled meetings (which are always advertised and open to the public).

This plan should be updated in written form at least once during the five (5)-year cycle. Such updates should be resubmitted to the WVDHSEM and FEMA Region III for approval. Upon approval, participating jurisdictions should re-adopt the plan by resolution.

APPENDIX 1

HAZUS FLOOD REPORTS FOR ALL REGION 11 COUNTIES

West Virginia Statewide HAZUS Level I Flood Analysis Project

BROOKE COUNTY
WEST VIRGINIA

HAZUS-MH: FLOOD EVENT REPORT
10 Year Flood Scenario

DISCLAIMER

Totals only reflect data for those census tracts/blocks included in the user's study region. The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific flood. These results can be improved by using enhanced inventory data and flood hazard information.

Report Date: May 14, 2010

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General Description of the Region

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- West Virginia

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 89 square miles and contains 727 census blocks. The region contains over 10 thousand households and has a total population of 25,447 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 12,220 buildings in the region with a total building replacement value (excluding contents) of 2,367 million dollars (2006 dollars). Approximately 94.55% of the buildings (and 73.65% of the building value) are associated with residential housing.

General Building Stock

HAZUS estimates that there are 12,220 buildings in the region which have an aggregate total replacement value of 2,367 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,743,521	73.6%
Commercial	233,183	9.8%
Industrial	234,972	9.9%
Agricultural	1,998	0.1%
Religion	37,770	1.6%
Government	16,345	0.7%
Education	99,577	4.2%
Total	**2,367,366**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	715,114	70.0%
Commercial	112,333	11.0%
Industrial	152,529	14.9%
Agricultural	962	0.1%
Religion	21,200	2.1%
Government	7,105	0.7%
Education	12,685	1.2%
Total	**1,021,928**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 4 police stations and no emergency operation centers.

Flood Scenario Parameters

HAZUS used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	BrookeCounty
Scenario Name:	10-YR
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

HAZUS estimates that about 683 buildings will be at least moderately damaged. This is over 7% of the total number of buildings in the scenario. There are an estimated 412 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS Flood technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	1	7.69	0	0.00	0	0.00	0	0.00	12	92.31
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	8	100.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Residential	0	0.00	3	0.46	50	7.60	20	3.04	197	29.94	388	58.97
Total	**0**		**4**		**50**		**20**		**197**		**412**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Masonry	0	0.00	1	0.56	13	7.22	4	2.22	55	30.56	107	59.44
Steel	0	0.00	1	9.09	0	0.00	0	0.00	0	0.00	10	90.91
Wood	0	0.00	2	0.41	37	7.64	16	3.31	142	29.34	287	59.30

Essential Facility Damage

Before the flood analyzed in this scenario, the region had hospital beds available for use. On the day of the scenario flood event, the model estimates that hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	6	0	1	0
Hospitals	0	0	0	0
Police Stations	4	0	3	0
Schools	11	1	2	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 100,043 tons of debris will be generated. Of the total amount, Finishes comprises 15% of the total, Structure comprises 43% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 4,002 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 850 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,811 people (out of a total population of 25,447) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 286.75 million dollars, which represents 27.60 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 281.82 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 45.33% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	83.28	25.15	14.62	12.47	135.51
	Content	46.53	43.73	29.32	19.23	138.81
	Inventory	0.00	0.96	6.51	0.02	7.50
	Subtotal	**129.80**	**69.84**	**50.45**	**31.72**	**281.82**
Business Interruption						
	Income	0.00	0.30	0.01	0.07	0.37
	Relocation	0.15	0.07	0.01	0.00	0.22
	Rental Income	0.04	0.04	0.00	0.00	0.08
	Wage	0.00	0.33	0.01	1.80	2.14
	Subtotal	**0.19**	**0.74**	**0.02**	**1.87**	**2.82**
ALL	**Total**	**129.99**	**70.59**	**50.47**	**33.60**	**284.64**

Appendix A: County Listing for the Region

West Virginia

- Brooke

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
West Virginia				
Brooke	25,447	1,743,521	623,845	2,367,366
Total	**25,447**	**1,743,521**	**623,845**	**2,367,366**
Total Study Region	**25,447**	**1,743,521**	**623,845**	**2,367,366**

West Virginia Statewide HAZUS Level I Flood Analysis Project

BROOKE COUNTY
WEST VIRGINIA

HAZUS-MH: FLOOD EVENT REPORT
25 Year Flood Scenario

DISCLAIMER

Totals only reflect data for those census tracts/blocks included in the user's study region. The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific flood. These results can be improved by using enhanced inventory data and flood hazard information.

Report Date: May 14, 2010

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General Description of the Region

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- West Virginia

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 89 square miles and contains 727 census blocks. The region contains over 10 thousand households and has a total population of 25,447 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 12,220 buildings in the region with a total building replacement value (excluding contents) of 2,367 million dollars (2006 dollars). Approximately 94.55% of the buildings (and 73.65% of the building value) are associated with residential housing.

General Building Stock

HAZUS estimates that there are 12,220 buildings in the region which have an aggregate total replacement value of 2,367 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,743,521	73.6%
Commercial	233,183	9.8%
Industrial	234,972	9.9%
Agricultural	1,998	0.1%
Religion	37,770	1.6%
Government	16,345	0.7%
Education	99,577	4.2%
Total	**2,367,366**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	725,850	69.4%
Commercial	116,194	11.1%
Industrial	159,054	15.2%
Agricultural	962	0.1%
Religion	22,251	2.1%
Government	7,105	0.7%
Education	14,002	1.3%
Total	**1,045,418**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 4 police stations and no emergency operation centers.

Flood Scenario Parameters

HAZUS used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	BrookeCounty
Scenario Name:	25-YR
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

HAZUS estimates that about 750 buildings will be at least moderately damaged. This is over 7% of the total number of buildings in the scenario. There are an estimated 528 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS Flood technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	13	100.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	1	7.14	13	92.86
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Residential	0	0.00	4	0.56	49	6.82	27	3.76	141	19.61	498	69.26
Total	**0**		**4**		**49**		**27**		**142**		**528**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	3	100.00
Masonry	0	0.00	1	0.50	14	7.00	5	2.50	40	20.00	140	70.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	1	5.26	18	94.74
Wood	0	0.00	3	0.57	35	6.69	22	4.21	101	19.31	362	69.22

Essential Facility Damage

Before the flood analyzed in this scenario, the region had hospital beds available for use. On the day of the scenario flood event, the model estimates that hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	6	0	1	0
Hospitals	0	0	0	0
Police Stations	4	0	3	0
Schools	11	1	2	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 109,360 tons of debris will be generated. Of the total amount, Finishes comprises 14% of the total, Structure comprises 43% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 4,374 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 909 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,930 people (out of a total population of 25,447) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 310.36 million dollars, which represents 29.87 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 305.30 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 46.05% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	92.46	28.66	15.70	14.47	151.29
	Content	50.27	45.09	30.67	20.24	146.27
	Inventory	0.00	1.01	6.71	0.02	7.75
	Subtotal	**142.73**	**74.76**	**53.08**	**34.73**	**305.30**
Business Interruption						
	Income	0.00	0.29	0.01	0.08	0.38
	Relocation	0.16	0.07	0.01	0.00	0.24
	Rental Income	0.04	0.05	0.00	0.00	0.09
	Wage	0.00	0.34	0.01	1.83	2.18
	Subtotal	**0.20**	**0.75**	**0.02**	**1.91**	**2.88**
ALL	**Total**	**142.93**	**75.51**	**53.10**	**36.64**	**308.18**

Appendix A: County Listing for the Region

West Virginia

- Brooke

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
West Virginia				
Brooke	25,447	1,743,521	623,845	2,367,366
Total	**25,447**	**1,743,521**	**623,845**	**2,367,366**
Total Study Region	**25,447**	**1,743,521**	**623,845**	**2,367,366**

West Virginia Statewide HAZUS Level I Flood Analysis Project

BROOKE COUNTY
WEST VIRGINIA

HAZUS-MH: FLOOD EVENT REPORT
50 Year Flood Scenario

DISCLAIMER

Totals only reflect data for those census tracts/blocks included in the user's study region. The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific flood. These results can be improved by using enhanced inventory data and flood hazard information.

Report Date: May 14, 2010

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General Description of the Region

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- West Virginia

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 89 square miles and contains 727 census blocks. The region contains over 10 thousand households and has a total population of 25,447 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 12,220 buildings in the region with a total building replacement value (excluding contents) of 2,367 million dollars (2006 dollars). Approximately 94.55% of the buildings (and 73.65% of the building value) are associated with residential housing.

General Building Stock

HAZUS estimates that there are 12,220 buildings in the region which have an aggregate total replacement value of 2,367 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,743,521	73.6%
Commercial	233,183	9.8%
Industrial	234,972	9.9%
Agricultural	1,998	0.1%
Religion	37,770	1.6%
Government	16,345	0.7%
Education	99,577	4.2%
Total	**2,367,366**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	697,750	70.5%
Commercial	95,663	9.7%
Industrial	157,834	16.0%
Agricultural	890	0.1%
Religion	18,088	1.8%
Government	6,650	0.7%
Education	12,563	1.3%
Total	**989,438**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 4 police stations and no emergency operation centers.

Flood Scenario Parameters

HAZUS used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	BrookeCounty
Scenario Name:	50-YR
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

HAZUS estimates that about 154 buildings will be at least moderately damaged. This is over 25% of the total number of buildings in the scenario. There are an estimated 10 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS Flood technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	4	2.60	48	31.17	24	15.58	68	44.16	10	6.49
Total	**0**		**4**		**48**		**24**		**68**		**10**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Masonry	0	0.00	1	2.56	13	33.33	5	12.82	19	48.72	1	2.56
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	3	2.63	35	30.70	19	16.67	49	42.98	8	7.02

Essential Facility Damage

Before the flood analyzed in this scenario, the region had hospital beds available for use. On the day of the scenario flood event, the model estimates that hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	6	0	0	0
Hospitals	0	0	0	0
Police Stations	4	0	0	0
Schools	11	1	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 8,369 tons of debris will be generated. Of the total amount, Finishes comprises 38% of the total, Structure comprises 32% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 335 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 869 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,934 people (out of a total population of 25,447) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 49.16 million dollars, which represents 4.73 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 48.65 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 65.96% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	20.10	2.24	1.30	0.62	24.26
	Content	12.28	5.55	2.57	3.54	23.94
	Inventory	0.00	0.13	0.32	0.00	0.46
	Subtotal	**32.37**	**7.92**	**4.18**	**4.17**	**48.65**
Business Interruption						
	Income	0.00	0.04	0.00	0.01	0.05
	Relocation	0.04	0.00	0.00	0.00	0.05
	Rental Income	0.01	0.00	0.00	0.00	0.01
	Wage	0.00	0.04	0.00	0.12	0.17
	Subtotal	**0.05**	**0.08**	**0.00**	**0.13**	**0.27**
ALL	**Total**	**32.42**	**8.01**	**4.19**	**4.30**	**48.92**

Appendix A: County Listing for the Region

West Virginia

- Brooke

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
West Virginia				
Brooke	25,447	1,743,521	623,845	2,367,366
Total	**25,447**	**1,743,521**	**623,845**	**2,367,366**
Total Study Region	**25,447**	**1,743,521**	**623,845**	**2,367,366**

West Virginia Statewide HAZUS Level I Flood Analysis Project

BROOKE COUNTY
WEST VIRGINIA

HAZUS-MH: FLOOD EVENT REPORT
100 Year Flood Scenario

DISCLAIMER

Totals only reflect data for those census tracts/blocks included in the user's study region. The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific flood. These results can be improved by using enhanced inventory data and flood hazard information.

Report Date: May 14, 2010

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General Description of the Region

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- West Virginia

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 89 square miles and contains 727 census blocks. The region contains over 10 thousand households and has a total population of 25,447 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 12,220 buildings in the region with a total building replacement value (excluding contents) of 2,367 million dollars (2006 dollars). Approximately 94.55% of the buildings (and 73.65% of the building value) are associated with residential housing.

General Building Stock

HAZUS estimates that there are 12,220 buildings in the region which have an aggregate total replacement value of 2,367 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,743,521	73.6%
Commercial	233,183	9.8%
Industrial	234,972	9.9%
Agricultural	1,998	0.1%
Religion	37,770	1.6%
Government	16,345	0.7%
Education	99,577	4.2%
Total	**2,367,366**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	778,215	70.8%
Commercial	117,936	10.7%
Industrial	159,054	14.5%
Agricultural	962	0.1%
Religion	22,251	2.0%
Government	7,105	0.6%
Education	14,002	1.3%
Total	**1,099,525**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 11 schools, 6 fire stations, 4 police stations and no emergency operation centers.

Flood Scenario Parameters

HAZUS used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	BrookeCounty
Scenario Name:	100-YR
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

HAZUS estimates that about 874 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the scenario. There are an estimated 628 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS Flood technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	38	100.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	3	100.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	12	100.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	7	100.00
Residential	0	0.00	7	0.86	64	7.87	31	3.81	144	17.71	567	69.74
Total	**0**		**7**		**64**		**31**		**144**		**628**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	3	100.00
Masonry	0	0.00	2	0.87	17	7.42	8	3.49	39	17.03	163	71.18
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	24	100.00
Wood	0	0.00	5	0.83	47	7.82	23	3.83	105	17.47	421	70.05

Essential Facility Damage

Before the flood analyzed in this scenario, the region had hospital beds available for use. On the day of the scenario flood event, the model estimates that hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	6	0	1	0
Hospitals	0	0	0	0
Police Stations	4	0	3	0
Schools	11	1	2	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 119,827 tons of debris will be generated. Of the total amount, Finishes comprises 15% of the total, Structure comprises 43% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 4,793 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,015 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 2,196 people (out of a total population of 25,447) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 342.03 million dollars, which represents 32.92 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 336.68 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 46.83% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	104.07	32.89	16.59	15.74	169.28
	Content	55.87	50.20	31.87	21.43	159.37
	Inventory	0.00	1.13	6.88	0.03	8.03
	Subtotal	**159.94**	**84.21**	**55.34**	**37.20**	**336.68**
Business Interruption						
	Income	0.00	0.33	0.01	0.08	0.41
	Relocation	0.18	0.08	0.01	0.00	0.26
	Rental Income	0.05	0.06	0.00	0.00	0.10
	Wage	0.00	0.38	0.01	1.87	2.25
	Subtotal	**0.23**	**0.85**	**0.02**	**1.95**	**3.04**
ALL	**Total**	**160.17**	**85.06**	**55.35**	**39.14**	**339.72**

Appendix A: County Listing for the Region

West Virginia

- Brooke

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
West Virginia				
Brooke	25,447	1,743,521	623,845	2,367,366
Total	**25,447**	**1,743,521**	**623,845**	**2,367,366**
Total Study Region	**25,447**	**1,743,521**	**623,845**	**2,367,366**

West Virginia Statewide HAZUS Level I Flood Analysis Project

HANCOCK COUNTY
WEST VIRGINIA

HAZUS-MH: FLOOD EVENT REPORT
10 Year Flood Scenario

DISCLAIMER

Totals only reflect data for those census tracts/blocks included in the user's study region. The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific flood. These results can be improved by using enhanced inventory data and flood hazard information.

Report Date: May 14, 2010

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General Description of the Region

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- West Virginia

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 83 square miles and contains 842 census blocks. The region contains over 14 thousand households and has a total population of 32,667 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 15,701 buildings in the region with a total building replacement value (excluding contents) of 2,798 million dollars (2006 dollars). Approximately 95.27% of the buildings (and 83.41% of the building value) are associated with residential housing.

General Building Stock

HAZUS estimates that there are 15,701 buildings in the region which have an aggregate total replacement value of 2,798 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,333,362	83.4%
Commercial	257,519	9.2%
Industrial	131,306	4.7%
Agricultural	1,299	0.0%
Religion	38,961	1.4%
Government	16,519	0.6%
Education	18,568	0.7%
Total	**2,797,534**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	718,073	78.7%
Commercial	62,992	6.9%
Industrial	91,662	10.0%
Agricultural	379	0.0%
Religion	16,692	1.8%
Government	12,496	1.4%
Education	10,052	1.1%
Total	**912,346**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 240 beds. There are 16 schools, 4 fire stations, 5 police stations and no emergency operation centers.

Flood Scenario Parameters

HAZUS used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	HancockCounty
Scenario Name:	10-YR
Return Period Analyzed:	10
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

HAZUS estimates that about 431 buildings will be at least moderately damaged. This is over 18% of the total number of buildings in the scenario. There are an estimated 192 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS Flood technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Residential	0	0.00	9	2.11	84	19.67	40	9.37	105	24.59	189	44.26
Total	**0**		**10**		**84**		**40**		**105**		**192**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	32	100.00
Masonry	0	0.00	1	0.93	23	21.50	10	9.35	30	28.04	43	40.19
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	8	2.78	61	21.18	30	10.42	75	26.04	114	39.58

Essential Facility Damage

Before the flood analyzed in this scenario, the region had hospital beds available for use. On the day of the scenario flood event, the model estimates that hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	4	0	0	0
Hospitals	1	0	0	0
Police Stations	5	1	1	0
Schools	16	1	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 33,578 tons of debris will be generated. Of the total amount, Finishes comprises 23% of the total, Structure comprises 38% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 1,343 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 635 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,267 people (out of a total population of 32,667) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 158.37 million dollars, which represents 16.94 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 154.88 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 51.09% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	51.63	10.20	3.11	10.23	75.16
	Content	29.16	20.06	7.25	21.44	77.90
	Inventory	0.00	0.37	1.45	0.00	1.81
	Subtotal	**80.79**	**30.62**	**11.80**	**31.67**	**154.88**
Business Interruption						
	Income	0.00	0.14	0.00	0.07	0.21
	Relocation	0.10	0.02	0.00	0.01	0.14
	Rental Income	0.02	0.02	0.00	0.00	0.04
	Wage	0.00	0.14	0.00	1.33	1.48
	Subtotal	**0.13**	**0.32**	**0.00**	**1.41**	**1.86**
ALL	**Total**	**80.91**	**30.94**	**11.80**	**33.08**	**156.74**

Appendix A: County Listing for the Region

West Virginia

- Hancock

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
West Virginia				
Hancock	32,667	2,333,362	464,172	2,797,534
Total	**32,667**	**2,333,362**	**464,172**	**2,797,534**
Total Study Region	**32,667**	**2,333,362**	**464,172**	**2,797,534**

West Virginia Statewide HAZUS Level I Flood Analysis Project

HANCOCK COUNTY
WEST VIRGINIA

HAZUS-MH: FLOOD EVENT REPORT
25 Year Flood Scenario

DISCLAIMER

Totals only reflect data for those census tracts/blocks included in the user's study region. The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific flood. These results can be improved by using enhanced inventory data and flood hazard information.

Report Date: May 14, 2010

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General Description of the Region

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- West Virginia

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 83 square miles and contains 842 census blocks. The region contains over 14 thousand households and has a total population of 32,667 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 15,701 buildings in the region with a total building replacement value (excluding contents) of 2,798 million dollars (2006 dollars). Approximately 95.27% of the buildings (and 83.41% of the building value) are associated with residential housing.

General Building Stock

HAZUS estimates that there are 15,701 buildings in the region which have an aggregate total replacement value of 2,798 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,333,362	83.4%
Commercial	257,519	9.2%
Industrial	131,306	4.7%
Agricultural	1,299	0.0%
Religion	38,961	1.4%
Government	16,519	0.6%
Education	18,568	0.7%
Total	**2,797,534**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	745,595	79.2%
Commercial	64,001	6.8%
Industrial	91,662	9.7%
Agricultural	379	0.0%
Religion	17,278	1.8%
Government	12,496	1.3%
Education	10,052	1.1%
Total	**941,463**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 240 beds. There are 16 schools, 4 fire stations, 5 police stations and no emergency operation centers.

Flood Scenario Parameters

HAZUS used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	HancockCounty
Scenario Name:	25-YR
Return Period Analyzed:	25
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

HAZUS estimates that about 578 buildings will be at least moderately damaged. This is over 16% of the total number of buildings in the scenario. There are an estimated 235 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS Flood technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	1	20.00	0	0.00	0	0.00	0	0.00	4	80.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Industrial	0	0.00	1	33.33	0	0.00	0	0.00	2	66.67	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Residential	0	0.00	8	1.41	94	16.58	50	8.82	187	32.98	228	40.21
Total	**0**		**10**		**94**		**50**		**189**		**235**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	37	100.00
Masonry	0	0.00	1	0.68	27	18.37	12	8.16	50	34.01	57	38.78
Steel	0	0.00	1	20.00	0	0.00	0	0.00	2	40.00	2	40.00
Wood	0	0.00	7	1.81	67	17.36	38	9.84	137	35.49	137	35.49

Essential Facility Damage

Before the flood analyzed in this scenario, the region had hospital beds available for use. On the day of the scenario flood event, the model estimates that hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	4	1	0	0
Hospitals	1	0	0	0
Police Stations	5	1	1	0
Schools	16	1	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 43,965 tons of debris will be generated. Of the total amount, Finishes comprises 23% of the total, Structure comprises 38% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 1,759 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 746 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,511 people (out of a total population of 32,667) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 198.67 million dollars, which represents 21.25 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 194.74 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 53.04% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	67.15	12.80	4.14	12.05	96.14
	Content	38.07	24.49	9.69	23.81	96.06
	Inventory	0.00	0.50	2.03	0.01	2.54
	Subtotal	**105.21**	**37.80**	**15.86**	**35.87**	**194.74**
Business Interruption						
	Income	0.00	0.16	0.00	0.07	0.24
	Relocation	0.13	0.03	0.00	0.01	0.17
	Rental Income	0.03	0.02	0.00	0.00	0.05
	Wage	0.00	0.18	0.00	1.50	1.68
	Subtotal	**0.16**	**0.39**	**0.01**	**1.58**	**2.14**
ALL	**Total**	**105.37**	**38.19**	**15.87**	**37.45**	**196.88**

Appendix A: County Listing for the Region

West Virginia

- Hancock

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
West Virginia				
Hancock	32,667	2,333,362	464,172	2,797,534
Total	**32,667**	**2,333,362**	**464,172**	**2,797,534**
Total Study Region	**32,667**	**2,333,362**	**464,172**	**2,797,534**

West Virginia Statewide HAZUS Level I Flood Analysis Project

HANCOCK COUNTY
WEST VIRGINIA

HAZUS-MH: FLOOD EVENT REPORT
50 Year Flood Scenario

DISCLAIMER

Totals only reflect data for those census tracts/blocks included in the user's study region. The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific flood. These results can be improved by using enhanced inventory data and flood hazard information.

Report Date: May 14, 2010

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General Description of the Region

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- West Virginia

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 83 square miles and contains 842 census blocks. The region contains over 14 thousand households and has a total population of 32,667 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 15,701 buildings in the region with a total building replacement value (excluding contents) of 2,798 million dollars (2006 dollars). Approximately 95.27% of the buildings (and 83.41% of the building value) are associated with residential housing.

General Building Stock

HAZUS estimates that there are 15,701 buildings in the region which have an aggregate total replacement value of 2,798 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,333,362	83.4%
Commercial	257,519	9.2%
Industrial	131,306	4.7%
Agricultural	1,299	0.0%
Religion	38,961	1.4%
Government	16,519	0.6%
Education	18,568	0.7%
Total	**2,797,534**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	744,079	79.1%
Commercial	64,110	6.8%
Industrial	91,662	9.8%
Agricultural	379	0.0%
Religion	17,318	1.8%
Government	12,496	1.3%
Education	10,052	1.1%
Total	**940,096**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 240 beds. There are 16 schools, 4 fire stations, 5 police stations and no emergency operation centers.

Flood Scenario Parameters

HAZUS used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	HancockCounty
Scenario Name:	50-YR
Return Period Analyzed:	50
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

HAZUS estimates that about 641 buildings will be at least moderately damaged. This is over 12% of the total number of buildings in the scenario. There are an estimated 258 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS Flood technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	2	25.00	0	0.00	0	0.00	0	0.00	6	75.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Industrial	0	0.00	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Residential	0	0.00	4	0.64	76	12.10	59	9.39	240	38.22	249	39.65
Total	**0**		**8**		**76**		**59**		**240**		**258**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	41	100.00
Masonry	0	0.00	1	0.62	19	11.73	17	10.49	67	41.36	58	35.80
Steel	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	3	75.00
Wood	0	0.00	3	0.70	57	13.32	42	9.81	173	40.42	153	35.75

Essential Facility Damage

Before the flood analyzed in this scenario, the region had hospital beds available for use. On the day of the scenario flood event, the model estimates that hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	4	1	0	0
Hospitals	1	0	0	0
Police Stations	5	1	1	0
Schools	16	1	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 50,659 tons of debris will be generated. Of the total amount, Finishes comprises 22% of the total, Structure comprises 39% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 2,026 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 779 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,580 people (out of a total population of 32,667) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 220.65 million dollars, which represents 23.61 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 216.54 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 52.59% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	73.96	14.34	5.46	12.64	106.41
	Content	41.91	27.03	13.16	24.52	106.61
	Inventory	0.00	0.56	2.94	0.01	3.51
	Subtotal	**115.87**	**41.93**	**21.56**	**37.17**	**216.54**
Business Interruption						
	Income	0.00	0.17	0.00	0.08	0.26
	Relocation	0.14	0.03	0.00	0.01	0.18
	Rental Income	0.03	0.02	0.00	0.00	0.05
	Wage	0.00	0.19	0.00	1.56	1.75
	Subtotal	**0.17**	**0.42**	**0.01**	**1.64**	**2.24**
ALL	**Total**	**116.04**	**42.35**	**21.57**	**38.81**	**218.78**

Appendix A: County Listing for the Region

West Virginia

- Hancock

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
West Virginia				
Hancock	32,667	2,333,362	464,172	2,797,534
Total	**32,667**	**2,333,362**	**464,172**	**2,797,534**
Total Study Region	**32,667**	**2,333,362**	**464,172**	**2,797,534**

West Virginia Statewide HAZUS Level I Flood Analysis Project

HANCOCK COUNTY
WEST VIRGINIA

HAZUS-MH: FLOOD EVENT REPORT
100 Year Flood Scenario

DISCLAIMER

Totals only reflect data for those census tracts/blocks included in the user's study region. The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific flood. These results can be improved by using enhanced inventory data and flood hazard information.

Report Date: May 14, 2010

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The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- West Virginia

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 83 square miles and contains 842 census blocks. The region contains over 14 thousand households and has a total population of 32,667 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 15,701 buildings in the region with a total building replacement value (excluding contents) of 2,798 million dollars (2006 dollars). Approximately 95.27% of the buildings (and 83.41% of the building value) are associated with residential housing.

General Building Stock

HAZUS estimates that there are 15,701 buildings in the region which have an aggregate total replacement value of 2,798 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,333,362	83.4%
Commercial	257,519	9.2%
Industrial	131,306	4.7%
Agricultural	1,299	0.0%
Religion	38,961	1.4%
Government	16,519	0.6%
Education	18,568	0.7%
Total	**2,797,534**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	748,841	79.3%
Commercial	64,110	6.8%
Industrial	91,662	9.7%
Agricultural	379	0.0%
Religion	17,318	1.8%
Government	12,496	1.3%
Education	10,052	1.1%
Total	**944,858**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 240 beds. There are 16 schools, 4 fire stations, 5 police stations and no emergency operation centers.

Flood Scenario Parameters

HAZUS used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	HancockCounty
Scenario Name:	100-YR
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

HAZUS estimates that about 681 buildings will be at least moderately damaged. This is over 11% of the total number of buildings in the scenario. There are an estimated 312 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS Flood technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	2	18.18	0	0.00	0	0.00	0	0.00	9	81.82
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Industrial	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Residential	0	0.00	5	0.75	74	11.11	51	7.66	236	35.44	300	45.05
Total	**0**		**8**		**74**		**51**		**236**		**312**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	48	100.00
Masonry	0	0.00	1	0.59	17	10.00	12	7.06	69	40.59	71	41.76
Steel	0	0.00	2	33.33	0	0.00	0	0.00	0	0.00	4	66.67
Wood	0	0.00	4	0.88	57	12.58	39	8.61	167	36.87	186	41.06

Essential Facility Damage

Before the flood analyzed in this scenario, the region had hospital beds available for use. On the day of the scenario flood event, the model estimates that hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	4	1	0	0
Hospitals	1	0	0	0
Police Stations	5	1	1	0
Schools	16	0	1	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 56,864 tons of debris will be generated. Of the total amount, Finishes comprises 21% of the total, Structure comprises 39% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 2,275 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 810 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,639 people (out of a total population of 32,667) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 233.69 million dollars, which represents 25.00 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 229.44 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 53.02% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	79.15	15.71	5.79	13.67	114.31
	Content	44.57	28.19	13.38	25.43	111.58
	Inventory	0.00	0.62	2.93	0.01	3.56
	Subtotal	**123.72**	**44.52**	**22.10**	**39.10**	**229.44**
Business Interruption						
	Income	0.00	0.18	0.00	0.08	0.27
	Relocation	0.14	0.04	0.00	0.01	0.19
	Rental Income	0.03	0.02	0.00	0.00	0.06
	Wage	0.00	0.20	0.00	1.62	1.82
	Subtotal	**0.18**	**0.44**	**0.01**	**1.71**	**2.33**
ALL	**Total**	**123.90**	**44.96**	**22.11**	**40.81**	**231.77**

Appendix A: County Listing for the Region

West Virginia

- Hancock

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
West Virginia				
Hancock	32,667	2,333,362	464,172	2,797,534
Total	**32,667**	**2,333,362**	**464,172**	**2,797,534**
Total Study Region	**32,667**	**2,333,362**	**464,172**	**2,797,534**

APPENDIX 2

REFERENCE COPIES OF WORKSHEET #3A FOR ALL REGION 11 COUNTIES

BROOKE COUNTY

Hazard: Civil Disturbance

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	4,822	44	$923,421,400	$4,617,107	1	24,069	9,873	41
Commercial	210	50	24	$48,090,000	$480,900	1	2,306	553	24
Industrial	75	50	67	$32,550,000	$325,500	1	1,960	1,313	67
Agricultural	104	0	0	$102,440,000	$0	0	89	0	0
Religious/Non-Profit	39	10	26	$5,850,000	$0	0	1,950	507	26
Government	12	2	17	$5,580,000	$55,800	1	1,024	174	17
Education	21	2	10	$186,900,000	$1,869,000	1	6,621	662	10
Utilities	22	5	23	$48,972,000	$0	0	314	72	23
Total	11,450	4,941	43	$1,353,803,400	$7,348,307	1	38,333	13,155	34

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Dam Failure

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	500	5	$923,421,400	$46,171,070	5	24,069	1,203	5
Commercial	210	25	12	$48,090,000	$5,770,800	12	2,306	277	12
Industrial	75	0	0	$32,550,000	$0	0	1,960	0	0
Agricultural	104	10	10	$102,440,000	$10,244,000	10	89	9	10
Religious/Non-Profit	39	5	13	$5,850,000	$292,500	5	1,950	98	5
Government	12	0	0	$5,580,000	$0	0	1,024	0	0
Education	21	0	0	$186,900,000	$0	0	6,621	0	0
Utilities	22	0	0	$48,972,000	$0	0	314	0	0
Total	11,450	540	5	$1,353,803,400	$62,478,370	5	38,333	1,587	4

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Drought

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	10,967	100	$923,421,400	$0	0	24,069	24,069	100
Commercial	210	210	100	$48,090,000	$0	0	2,306	2,306	100
Industrial	75	75	100	$32,550,000	$0	0	1,960	1,960	100
Agricultural	104	104	100	$102,440,000	$0	0	89	89	100
Religious/Non-Profit	39	39	100	$5,850,000	$0	0	1,950	1,950	100
Government	12	12	100	$5,580,000	$0	0	1,024	1,024	100
Education	21	21	100	$186,900,000	$0	0	6,621	6,621	100
Utilities	22	22	100	$48,972,000	$0	0	314	314	100
Total	11,450	11,450	100	$1,353,803,400	$0	0	38,333	38,333	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Earthquake

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	10,967	100	$923,421,400	$0	0	24,069	24,069	100
Commercial	210	210	100	$48,090,000	$0	0	2,306	2,306	100
Industrial	75	75	100	$32,550,000	$0	0	1,960	1,960	100
Agricultural	104	104	100	$102,440,000	$0	0	89	89	100
Religious/Non-Profit	39	39	100	$5,850,000	$0	0	1,950	1,950	100
Government	12	12	100	$5,580,000	$0	0	1,024	1,024	100
Education	21	21	100	$186,900,000	$0	0	6,621	6,621	100
Utilities	22	22	100	$48,972,000	$0	0	314	314	100
Total	11,450	11,450	100	$1,353,803,400	$0	0	38,333	38,333	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Flooding

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	570	5	$923,421,400	$46,171,070	5	24,069	1,203	5
Commercial	210	100	48	$48,090,000	$23,083,200	48	2,306	1,107	48
Industrial	75	25	33	$32,550,000	$10,741,500	33	1,960	647	33
Agricultural	104	10	10	$102,440,000	$10,244,000	10	89	9	10
Religious/Non-Profit	39	11	28	$5,850,000	$1,638,000	28	1,950	546	28
Government	12	5	42	$5,580,000	$2,343,600	42	1,024	430	42
Education	21	5	24	$186,900,000	$44,856,000	24	6,621	1,589	24
Utilities	22	15	68	$48,972,000	$33,300,960	68	314	214	68
Total	11,450	741	6	$1,353,803,400	$172,378,330	13	38,333	5,745	15

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Hailstorm

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	10,967	100	$923,421,400	$9,234,214	0.01	24,069	24,069	100
Commercial	210	210	100	$48,090,000	$480,900	0.01	2,306	2,306	100
Industrial	75	75	100	$32,550,000	$325,500	0.01	1,960	1,960	100
Agricultural	104	104	100	$102,440,000	$1,024,400	0.01	89	89	100
Religious/Non-Profit	39	39	100	$5,850,000	$58,500	0.01	1,950	1,950	100
Government	12	12	100	$5,580,000	$55,800	0.01	1,024	1,024	100
Education	21	21	100	$186,900,000	$1,869,000	0.01	6,621	6,621	100
Utilities	22	22	100	$48,972,000	$489,720	0.01	314	314	100
Total	11,450	11,450	100	$1,353,803,400	$13,538,034	1.00	38,333	38,333	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Hazardous Material Incident

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	3,300	30	$923,421,400	$277,026,420	30	24,069	7,221	30
Commercial	210	100	48	$48,090,000	$23,083,200	48	2,306	1,107	48
Industrial	75	60	80	$32,550,000	$26,040,000	80	1,960	1,568	80
Agricultural	104	50	48	$102,440,000	$49,171,200	48	89	43	48
Religious/Non-Profit	39	17	44	$5,850,000	$2,574,000	44	1,950	858	44
Government	12	2	17	$5,580,000	$948,600	17	1,024	174	17
Education	21	11	52	$186,900,000	$97,188,000	52	6,621	3,443	52
Utilities	22	22	100	$48,972,000	$48,972,000	100	314	314	100
Total	11,450	3,562	31	$1,353,803,400	$525,003,420	39	38,333	14,727	38

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Land Subsidence

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	7,818	71	$923,421,400	$655,629,194	71	24,069	17,089	71
Commercial	210	175	83	$48,090,000	$39,914,700	83	2,306	1,914	83
Industrial	75	50	67	$32,550,000	$21,808,500	67	1,960	1,313	67
Agricultural	104	20	19	$102,440,000	$19,463,600	19	89	17	19
Religious/Non-Profit	39	28	72	$5,850,000	$4,212,000	72	1,950	1,404	72
Government	12	10	83	$5,580,000	$4,631,400	83	1,024	850	83
Education	21	10	48	$186,900,000	$89,712,000	48	6,621	3,178	48
Utilities	22	10	45	$48,972,000	$22,037,400	45	314	141	45
Total	11,450	8,121	71	$1,353,803,400	$857,408,794	63	38,333	25,906	68

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Radiological Hazard

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	0	0	$923,421,400	$0	0	24,069	0	0
Commercial	210	0	0	$48,090,000	$0	0	2,306	0	0
Industrial	75	0	0	$32,550,000	$0	0	1,960	0	0
Agricultural	104	0	0	$102,440,000	$0	0	89	0	0
Religious/Non-Profit	39	0	0	$5,850,000	$0	0	1,950	0	0
Government	12	0	0	$5,580,000	$0	0	1,024	0	0
Education	21	0	0	$186,900,000	$0	0	6,621	0	0
Utilities	22	0	0	$48,972,000	$0	0	314	0	0
Total	11,450	0	0	$1,353,803,400	$0	0	38,333	0	0

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Terrorism

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	4,822	44	$923,421,400	$406,305,416	44	24,069	10,590	44
Commercial	210	150	71	$48,090,000	$34,143,900	71	2,306	1,637	71
Industrial	75	75	100	$32,550,000	$32,550,000	100	1,960	1,960	100
Agricultural	104	0	0	$102,440,000	$0	0	89	0	0
Religious/Non-Profit	39	0	0	$5,850,000	$0	0	1,950	0	0
Government	12	12	100	$5,580,000	$5,580,000	100	1,024	1,024	100
Education	21	11	52	$186,900,000	$97,188,000	52	6,621	3,443	52
Utilities	22	5	23	$48,972,000	$11,263,560	23	314	72	23
Total	11,450	5,075	44	$1,353,803,400	$587,030,876	43	38,333	18,727	49

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Thunderstorm

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	10,967	100	$923,421,400	$9,234,214	1	24,069	24,069	100
Commercial	210	210	100	$48,090,000	$480,900	1	2,306	2,306	100
Industrial	75	75	100	$32,550,000	$325,500	1	1,960	1,960	100
Agricultural	104	104	100	$102,440,000	$1,024,400	1	89	89	100
Religious/Non-Profit	39	39	100	$5,850,000	$58,500	1	1,950	1,950	100
Government	12	12	100	$5,580,000	$55,800	1	1,024	1,024	100
Education	21	21	100	$186,900,000	$1,869,000	1	6,621	6,621	100
Utilities	22	22	100	$48,972,000	$489,720	1	314	314	100
Total	11,450	11,450	100	$1,353,803,400	$13,538,034	1	38,333	38,333	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Wildfire

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	2,762	25	$923,421,400	$230,855,350	25	24,069	6,320	26
Commercial	210	50	24	$48,090,000	$11,541,600	24	2,306	553	24
Industrial	75	0	0	$32,550,000	$0	0	1,960	0	0
Agricultural	104	104	100	$102,440,000	$102,440,000	100	89	89	100
Religious/Non-Profit	39	10	26	$5,850,000	$1,521,000	26	1,950	507	26
Government	12	0	0	$5,580,000	$0	0	1,024	0	0
Education	21	2	10	$186,900,000	$18,690,000	10	6,621	662	10
Utilities	22	5	23	$48,972,000	$11,263,560	23	314	72	23
Total	11,450	2,933	26	$1,353,803,400	$376,311,510	28	38,333	8,204	21

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Wind

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	10,967	100	$923,421,400	$13,851,321	1.5	24,069	24,069	100
Commercial	210	210	100	$48,090,000	$721,350	1.5	2,306	2,306	100
Industrial	75	75	100	$32,550,000	$488,250	1.5	1,960	1,960	100
Agricultural	104	104	100	$102,440,000	$1,536,600	1.5	89	89	100
Religious/Non-Profit	39	39	100	$5,850,000	$87,750	1.5	1,950	1,950	100
Government	12	12	100	$5,580,000	$83,700	1.5	1,024	1,024	100
Education	21	21	100	$186,900,000	$2,803,500	1.5	6,621	6,621	100
Utilities	22	22	100	$48,972,000	$734,580	1.5	314	314	100
Total	11,450	11,450	100	$1,353,803,400	$20,307,051	1.5	38,333	38,333	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Winter Storm

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	10,967	10,967	100	$923,421,400	$18,468,428	2	24,069	24,069	100
Commercial	210	210	100	$48,090,000	$961,800	2	2,306	2,306	100
Industrial	75	75	100	$32,550,000	$651,000	2	1,960	1,960	100
Agricultural	104	104	100	$102,440,000	$2,048,800	2	89	89	100
Religious/Non-Profit	39	39	100	$5,850,000	$117,000	2	1,950	1,950	100
Government	12	12	100	$5,580,000	$111,600	2	1,024	1,024	100
Education	21	21	100	$186,900,000	$3,738,000	2	6,621	6,621	100
Utilities	22	22	100	$48,972,000	$979,440	2	314	314	100
Total	11,450	11,450	100	$1,353,803,400	$27,076,068	2	38,333	38,333	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

HANCOCK COUNTY

Hazard: Civil Disturbance

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	6,032	41	$1,231,622,700	$6,158,114	1	30,676	12,458	41
Commercial	497	75	15	$113,813,000	$1,138,130	1	5,471	821	15
Industrial	109	35	32	$47,306,000	$473,060	1	2,839	908	32
Agricultural	109	10	9	$39,894,000	$0	0	62	6	9
Religious/Non-Profit	35	15	43	$5,250,000	$0	0	1,750	753	43
Government	8	4	50	$3,720,000	$37,200	1	1,405	703	50
Education	10	3	30	$89,000,000	$890,000	1	7,259	2,178	30
Utilities	9	4	44	$20,034,000	$0	0	298	131	44
Total	15,318	6,178	40	$1,550,639,700	$8,696,504	1	49,760	17,957	36

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Dam Failure

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	1,381	9	$1,231,622,700	$110,846,043	9	30,676	2,585	8
Commercial	497	50	10	$113,813,000	$11,381,300	10	5,471	547	10
Industrial	109	0	0	$47,306,000	$0	0	2,839	0	0
Agricultural	109	5	5	$39,894,000	$1,994,700	5	62	3	5
Religious/Non-Profit	35	2	6	$5,250,000	$315,000	6	1,750	105	6
Government	8	1	13	$3,720,000	$483,600	13	1,405	183	13
Education	10	1	10	$89,000,000	$8,900,000	10	7,259	726	10
Utilities	9	1	11	$20,034,000	$2,203,740	11	298	33	11
Total	15,318	1,441	9	$1,550,639,700	$136,124,383	9	49,760	4,182	8

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Drought

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	14,541	100	$1,231,622,700	$0	0	30,676	30,676	100
Commercial	497	497	100	$113,813,000	$0	0	5,471	5,471	100
Industrial	109	109	100	$47,306,000	$0	0	2,839	2,839	100
Agricultural	109	109	100	$39,894,000	$0	0	62	62	100
Religious/Non-Profit	35	35	100	$5,250,000	$0	0	1,750	1,750	100
Government	8	8	100	$3,720,000	$0	0	1,405	1,405	100
Education	10	10	100	$89,000,000	$0	0	7,259	7,259	100
Utilities	9	9	100	$20,034,000	$0	0	298	298	100
Total	15,318	15,318	100	$1,550,639,700	$0	0	49,760	49,760	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Earthquake

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	14,541	100	$1,231,622,700	$0	0	30,676	30,676	100
Commercial	497	497	100	$113,813,000	$0	0	5,471	5,471	100
Industrial	109	109	100	$47,306,000	$0	0	2,839	2,839	100
Agricultural	109	109	100	$39,894,000	$0	0	62	62	100
Religious/Non-Profit	35	35	100	$5,250,000	$0	0	1,750	1,750	100
Government	8	8	100	$3,720,000	$0	0	1,405	1,405	100
Education	10	10	100	$89,000,000	$0	0	7,259	7,259	100
Utilities	9	9	100	$20,034,000	$0	0	298	298	100
Total	15,318	15,318	100	$1,550,639,700	$0	0	49,760	49,760	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Flooding

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	338	2	$1,231,622,700	$24,632,454	2	30,676	614	2
Commercial	497	58	12	$113,813,000	$13,657,560	12	5,471	657	12
Industrial	109	13	12	$47,306,000	$5,676,720	12	2,839	341	12
Agricultural	109	4	4	$39,894,000	$1,595,760	4	62	2	4
Religious/Non-Profit	35	4	11	$5,250,000	$577,500	11	1,750	193	11
Government	8	2	25	$3,720,000	$930,000	25	1,405	351	25
Education	10	2	20	$89,000,000	$17,800,000	20	7,259	1,452	20
Utilities	9	6	67	$20,034,000	$13,422,780	67	298	200	67
Total	15,318	427	3	$1,550,639,700	$78,292,774	5	49,760	3,808	8

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Hailstorm

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	14,541	100	$1,231,622,700	$12,316,227	0.01	30,676	30,676	100
Commercial	497	497	100	$113,813,000	$1,138,130	0.01	5,471	5,471	100
Industrial	109	109	100	$47,306,000	$473,060	0.01	2,839	2,839	100
Agricultural	109	109	100	$39,894,000	$398,940	0.01	62	62	100
Religious/Non-Profit	35	35	100	$5,250,000	$52,500	0.01	1,750	1,750	100
Government	8	8	100	$3,720,000	$37,200	0.01	1,405	1,405	100
Education	10	10	100	$89,000,000	$890,000	0.01	7,259	7,259	100
Utilities	9	9	100	$20,034,000	$200,340	0.01	298	298	100
Total	15,318	15,318	100	$1,550,639,700	$15,506,397	1.00	49,760	49,760	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Hazardous Material Incident

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	4,400	30	$1,231,622,700	$369,486,810	30	30,676	9,203	30
Commercial	497	400	80	$113,813,000	$91,050,400	80	5,471	4,377	80
Industrial	109	90	83	$47,306,000	$39,263,980	83	2,839	2,356	83
Agricultural	109	50	46	$39,894,000	$18,351,240	46	62	29	46
Religious/Non-Profit	35	20	57	$5,250,000	$2,992,500	57	1,750	998	57
Government	8	8	100	$3,720,000	$3,720,000	100	1,405	1,405	100
Education	10	9	90	$89,000,000	$80,100,000	90	7,259	6,533	90
Utilities	9	9	100	$20,034,000	$20,034,000	100	298	298	100
Total	15,318	4,986	33	$1,550,639,700	$624,998,930	40	49,760	25,198	51

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Land Subsidence

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	5,406	37	$1,231,622,700	$455,700,399	37	30,676	11,350	37
Commercial	497	300	60	$113,813,000	$68,287,800	60	5,471	3,283	60
Industrial	109	75	69	$47,306,000	$32,641,140	69	2,839	1,959	69
Agricultural	109	20	18	$39,894,000	$7,180,920	18	62	11	18
Religious/Non-Profit	35	13	37	$5,250,000	$1,942,500	37	1,750	648	37
Government	8	4	50	$3,720,000	$1,860,000	50	1,405	703	50
Education	10	3	30	$89,000,000	$26,700,000	30	7,259	2,178	30
Utilities	9	5	56	$20,034,000	$11,219,040	56	298	167	56
Total	15,318	5,826	38	$1,550,639,700	$605,531,799	39	49,760	20,297	41

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Radiological Hazard

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	11,197	77	$1,231,622,700	$948,349,479	77	30,676	23,590	77
Commercial	497	150	30	$113,813,000	$34,143,900	30	5,471	1,641	30
Industrial	109	20	18	$47,306,000	$8,515,080	18	2,839	511	18
Agricultural	109	50	46	$39,894,000	$18,351,240	46	62	29	46
Religious/Non-Profit	35	27	77	$5,250,000	$4,042,500	77	1,750	1,348	77
Government	8	2	25	$3,720,000	$930,000	25	1,405	351	25
Education	10	2	20	$89,000,000	$17,800,000	20	7,259	1,452	20
Utilities	9	3	33	$20,034,000	$6,611,220	33	298	98	33
Total	15,318	11,451	75	$1,550,639,700	$1,038,743,419	67	49,760	29,020	58

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Terrorism

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	6,771	47	$1,231,622,700	$578,862,669	47	30,676	14,418	47
Commercial	497	200	40	$113,813,000	$45,525,200	40	5,471	2,188	40
Industrial	109	109	100	$47,306,000	$47,306,000	100	2,839	2,839	100
Agricultural	109	0	0	$39,894,000	$0	0	62	0	0
Religious/Non-Profit	35	0	0	$5,250,000	$0	0	1,750	0	0
Government	8	8	100	$3,720,000	$3,720,000	100	1,405	1,405	100
Education	10	8	80	$89,000,000	$71,200,000	80	7,259	5,807	80
Utilities	9	6	67	$20,034,000	$13,422,780	67	298	200	67
Total	15,318	7,102	46	$1,550,639,700	$760,036,649	49	49,760	26,857	54

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Thunderstorm

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	14,541	100	$1,231,622,700	$12,316,227	1	30,676	30,676	100
Commercial	497	497	100	$113,813,000	$1,138,130	1	5,471	5,471	100
Industrial	109	109	100	$47,306,000	$473,060	1	2,839	2,839	100
Agricultural	109	109	100	$39,894,000	$398,940	1	62	62	100
Religious/Non-Profit	35	35	100	$5,250,000	$52,500	1	1,750	1,750	100
Government	8	8	100	$3,720,000	$37,200	1	1,405	1,405	100
Education	10	10	100	$89,000,000	$890,000	1	7,259	7,259	100
Utilities	9	9	100	$20,034,000	$200,340	1	298	298	100
Total	15,318	15,318	100	$1,550,639,700	$15,506,397	1	49,760	49,760	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Wildfire

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	7,128	49	$1,231,622,700	$603,495,123	49	30,676	15,633	51
Commercial	497	100	20	$113,813,000	$22,762,600	20	5,471	1,094	20
Industrial	109	0	0	$47,306,000	$0	0	2,839	0	0
Agricultural	109	109	100	$39,894,000	$39,894,000	100	62	62	100
Religious/Non-Profit	35	18	51	$5,250,000	$2,677,500	51	1,750	893	51
Government	8	0	0	$3,720,000	$0	0	1,405	0	0
Education	10	2	20	$89,000,000	$17,800,000	20	7,259	1,452	20
Utilities	9	3	33	$20,034,000	$6,611,220	33	298	98	33
Total	15,318	7,360	48	$1,550,639,700	$693,240,443	45	49,760	19,232	39

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Wind

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	14,541	100	$1,231,622,700	$18,474,341	1.5	30,676	30,676	100
Commercial	497	497	100	$113,813,000	$1,707,195	1.5	5,471	5,471	100
Industrial	109	109	100	$47,306,000	$709,590	1.5	2,839	2,839	100
Agricultural	109	109	100	$39,894,000	$598,410	1.5	62	62	100
Religious/Non-Profit	35	35	100	$5,250,000	$78,750	1.5	1,750	1,750	100
Government	8	8	100	$3,720,000	$55,800	1.5	1,405	1,405	100
Education	10	10	100	$89,000,000	$1,335,000	1.5	7,259	7,259	100
Utilities	9	9	100	$20,034,000	$300,510	1.5	298	298	100
Total	15,318	15,318	100	$1,550,639,700	$23,259,596	1.5	49,760	49,760	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

Hazard: Winter Storm

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community	# in Hazard Area	% in Hazard Area	$ in Community	$ in Hazard Area	% in Hazard Area	# in Community	# in Hazard Area	% in Hazard Area
Residential	14,541	14,541	100	$1,231,622,700	$24,632,454	2	30,676	30,676	100
Commercial	497	497	100	$113,813,000	$2,276,260	2	5,471	5,471	100
Industrial	109	109	100	$47,306,000	$946,120	2	2,839	2,839	100
Agricultural	109	109	100	$39,894,000	$797,880	2	62	62	100
Religious/Non-Profit	35	35	100	$5,250,000	$105,000	2	1,750	1,750	100
Government	8	8	100	$3,720,000	$74,400	2	1,405	1,405	100
Education	10	10	100	$89,000,000	$1,780,000	2	7,259	7,259	100
Utilities	9	9	100	$20,034,000	$400,680	2	298	298	100
Total	15,318	15,318	100	$1,550,639,700	$31,012,794	2	49,760	49,760	100

	Yes	No
1. Do you know where your greatest damages may occur in your hazard areas?	X	
2. Do you know whether your critical facilities will be operational after a hazard event?	X	
3. Is there enough data to determine which assets are subject to the greatest potential damages?	X	
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	X	
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	X	
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	X	
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?		X

APPENDIX 3

GLOSSARY

APPENDIX 3

This appendix contains a list of definitions for commonly-used terms in this mitigation plan. It also contains a list of the acronyms that are used throughout.

DEFINITION OF TERMS

10-Year Flood: A flood event with a 10% chance of occurring in any single year.

25-Year Flood: A flood event with a 4% chance of occurring in any single year.

50-Year Flood: A flood event with a 2% chance of occurring in any single year.

100-Year Flood: A flood event with a 1% chance of being equaled or exceeded in any single year.

Asset Inventory: A listing of critical facilities, historical facilities, facilities housing vulnerable populations (e.g., schools, nursing homes, hospitals), large economic assets in the community, and other, community-designated special considerations on which a risk assessment is completed.

Benefit Cost Review: A process by which a community considers both the potential benefits of mitigation projects in comparison with their costs. It is a way to determine if the costs are achievable and feasible based on the benefits that can be realistically anticipated.

Emergency Services Project: Action that protects people and property during and immediately after a disaster or hazard event.

Hazard Risk Assessment: The process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from hazards by assessing the vulnerability of people, buildings, and infrastructure to hazards.

Loss Estimate: A mathematical calculation of the potential damage – structural, contents, and functional – a facility and/or community could occur as a result of a

specific hazard.

Mitigation: Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or man-made disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities. Mitigation seeks to fix the cycle of disaster damage, reconstruction, and repeated damage. These activities or actions, in most cases, will have a long-term sustained effect.

Natural Resource Protection: Action that, in addition to minimizing hazard losses, also preserves or restores the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

Prevention: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses.

Property Protection: Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area.

Public Education and Awareness Project: Action to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

Robert T. Stafford Disaster Relief and Emergency Assistance Act: Section 322 was added as part of the Disaster Mitigation Act (DMA) of 2000 to take a new and revitalized approach to mitigation planning. This new section emphasizes the need for local entities to closely coordinate mitigation planning and implementation efforts. In succinct terms, this is the mandate requiring local communities to compile and adopt a mitigation plan as an eligibility requirement for mitigation funding.

STAPLEE Method: A technique for identifying, evaluating, and prioritizing mitigation actions based on existing local conditions. It advocates an analysis based on the following conditions: social, technical, administrative, political, legal, economic, and environmental.

Structural Project: Action that involves the construction of structures to reduce the impact of a hazard.

DEFINITION OF ACRONYMS

AAR	After-Action Report
BCEMA	Brooke County Emergency Management Agency
BHJ	Brooke-Hancock-Jefferson Metropolitan Planning Commission
BSA	Boy Scouts of America
CEDS	Comprehensive Economic Development Strategy
CERT	Community Emergency Response Team
CFR	Code of Federal Regulations
CFS	Commodity Flow Study
CRS	Community Rating System
D-FIRM	Digital Flood Insurance Rate Map
DMA	Disaster Mitigation Act
EDA	Economic Development Authority
EMPG	Emergency Management Performance Grant
EMS	Emergency Medical Services
EPI	Emergency Public Information
EPZ	Emergency Planning Zone
EOP	Emergency Operations Plan
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance Grant Program
HCOEM	Hancock County Office of Emergency Management
HMEP	Hazardous Materials Emergency Planning Grant
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
IJDC	West Virginia Infrastructure and Jobs Development Council

IP	Improvement Plan
JIS	Joint Information System
LEPC	Local Emergency Planning Committee
NCDC	National Climatic Data Center
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NIMS	National Incident Management System
NRC	Nuclear Regulatory Commission
NWS	National Weather Service
PDC	Planning and Development Council
PDM	Pre Disaster Mitigation Grant Program
PDSI	Palmer Drought Severity Index
PGA	Peak Ground Acceleration
POC	Point of Contact
PSD	Public Service District
RESA	Regional Education Service Agency
RL	Repetitive Loss
SCBG	Small Cities Block Grant
SERC	State Emergency Response Commission
SFHA	Special Flood Hazard Area
SHSP	State Homeland Security Grant Program
SR	State Route
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, and Environmental
USDA	United States Department of Agriculture
USDHS	United States Department of Homeland Security
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WCS	Worst-Case Scenario
WFAS	Wildland Fire Assessment Strategy
WVDEP	West Virginia Department of Environmental Protection
WVDHSEM	West Virginia Division of Homeland Security and Emergency Management

WVDNR	West Virginia Department of Natural Resources
WVDOH	West Virginia Division of Highways
WVOES	West Virginia Office of Emergency Services (Out of Use)
WVU	West Virginia University

APPENDIX 4

RECORD OF ADOPTION

BHJ MPC (Region 11) HAZARD MITIGATION PLAN
PLANNING COMMITTEE MEETING

May 12, 2011

AGENDA

1. Introductions
2. Overview of the Mitigation Plan Update Process
   a. Review Stafford Act Legislation Requiring the Update
   b. Changes for this Update Process
   c. Items to Be Updated
   d. Contractor Expectations
   e. Community Expectations

3. Hazard Risk Discussion
   a. Hazards to Include
   b. Historical Occurrences Since 2004
   c. General (i.e., Open) Discussion Regarding Hazards

4. Mitigation Project Discussion
   a. How Projects Will Be Presented
   b. “Regional” Projects
   c. What Will Be Needed per Jurisdiction
   d. General (i.e., Open) Discussion Regarding Projects

5. Q & A
6. Adjournment

BHJ (Region II) Hazard Mitigation Plan
Stakeholders Mtg. #1 5/12/2011 - 1:30pm
Sign-In Sheet

	Name	Agency/Org.	Contact
1.	Jeff Harvey	JH Consulting	jharvey@jhemergencypreparedness.com
2.	MARK B. Henne	City of Wellsburg	markbhennecitymgr@comcast.net
3	Gary DuFour	City of Weirton	citymanager@cityofweirton.com
4.	Barb Zimnox	BHJ	bzimnox@bhjmpc.org
5	Jerry Shumate	Weirton F.D.	WEIRFDCPT14@gmail.com
6.	Cindy Hoffman	Town of Bethany	autumncoopers2@frontier.com
7.	John Paul Jones	HC OEM	jpj4040@hotmail.com
8.	K. Robert Fowler	Brooke Co EMA	BFowler@mail.wvnet.edu

BHJ (Region 11) Hazard Mitigation Plan
Stakeholders Meeting #1
Minutes

Call to Order: Approximately 1:30 p.m.

Attendance:

- Barb Zimnox, BHJ
- Jeff Harvey, JH Consulting
- Mark Henne, City of Wellsburg
- Gary DuFour, City of Weirton
- Jerry Shumate, Weirton Fire Department
- Cindy Hoffman, Town of Bethany
- John Paul Jones, Hancock County Office of Emergency Management
- Bob Fowler, Brooke County Emergency Management Agency

Topics Discussed:

- The contractor provided an overview of the mitigation planning process. The key items to be updated as part of this project include:
  - Consolidate individual Brooke and Hancock County plans into a single "Region 11" document. The new plan will still be "multi-jurisdictional" – as were the original plans – they will simply include more jurisdictions. Consolidation is a state initiative (supported by FEMA Region III) and is modeled on the approach taken in Virginia.
  - The hazards addressed by the plan will be updated. Such questions as "How well did the original plans predict risk areas?"; "What types of events have occurred since the original adoption of the mitigation plans in 2005?"; and "How has the area changed since the original adoption of the plans?" will be addressed.
  - The project list in the plans will be updated. Original projects will be marked as completed, deleted, deferred, or on-going. New projects can be added. The revised project list will be re-prioritized.
  - The mitigation plan was developed and is maintained pursuant to Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (as amended by the Disaster Mitigation Act of 2000). Having a current mitigation plan (i.e., updated every five years) keeps communities eligible for "mitigation funding", including the

Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, and the Flood Mitigation Assistance program.

- General Hazard Discussion
  - Hazards to be included are as follows:
    - Dam failure,
    - Drought,
    - Earthquake,
    - Flooding,
    - Hailstorm,
    - Hazmat incident,
    - Land subsidence,
    - Terrorism (i.e., man-made hazards),
    - Thunderstorms,
    - Wildfire,
    - Wind and tornados, and
    - Winter storms.

  - The group determined that a discussion of “cascading hazards”, i.e., those that occur along with or as a result of other hazards, should be included. Examples include utility disruptions/failures and communications failures.
  - Attendees discussed land subsidence in and near Wellsburg that can limit access during other hazard events (e.g., should the city need to be evacuated, land subsidence along roadways could create blockages).
  - Attendees discussed flood risk areas in Wellsburg. The west side of the town, including numerous residences and businesses, is in the 100-year floodplain.
  - Attendees suggested making a distinction in the flooding profile about what constitutes river flooding versus flash flooding. Wellsburg and other areas of Brooke County as well as along State Route 2 near New Cumberland in Hancock County see a lot of flooding related to storm water run-off.
  - The Soil Conservation Service (SCS) out of McMechen coordinates efforts dealing with the control dams throughout Brooke County.
  - The nuclear/radiological hazard should be added to the hazard list originally presented (see above). The emergency managers in attendance indicated that there

may be some major changes about designations of the Emergency Planning Zone (EPZ) in the wake of the Japan situation.

- In the hazardous material discussion, attendees felt it would be important to discuss the industrial elements as well as the fracturing operations that are becoming more common in the Northern Panhandle.
- Gang violence and civil disturbances should be included in the man-made hazards section. Attendees indicated growing concerns over violence in both Steubenville and East Liverpool that could affect Brooke and Hancock Counties. The drug trade also factors into this discussion as heroin and cocaine usage has been noted in the Weirton area.
- Events that have occurred since the original adoption of the plan include:
  - 2004 flood,
  - January 2005 flood,
  - 2009 winter storms,
  - 2010 winter storms, and
  - River flooding in early 2011 in Wellsburg (affected 12 hours, 2 businesses, and 1 church).

- General Project Discussion
  - A mitigation project has been implemented along King Creek since 2004.
  - A buyout project in Wellsburg currently has ten (10) applicants.
  - Adopting the FEMA standard floodplain ordinance has caused some implementation issues in Wellsburg, related to the issuance of building permits, etc.
  - Wellsburg is undertaking a project to re-build inflows within its sewer service.
  - Participants suggested not only compiling mitigation project lists for individual jurisdictions, but also a regional project list in an effort to maximize the use of potential mitigation funding that could come into the region.

- The next meeting of the stakeholders committee will likely take place near the end of June. Stakeholders should be provided with draft risk assessment materials and be prepared to discuss mitigation projects at length. BHJ will notify stakeholders when the meeting is set.

BHJ MPC (Region 11) HAZARD MITIGATION PLAN
PLANNING COMMITTEE MEETING

August 1, 2011

AGENDA

1. Introductions
2. NexGen Communications Project Discussion
3. Review Draft Risk Assessment Information
   a. Explain the Process
      i. How was the information gathered?
      ii. Discuss civil disturbance, dam failure, hazardous materials, and radiological hazards in more detail.
      iii. What remains to be collected?

   b. General Discussion
   c. Additions, Deletions, Changes

4. Discuss Mitigation Projects
   a. Review Existing Projects (i.e., Run through list to note status of each project)
   b. Add New Projects
   c. Review Prioritization Paperwork

5. Q & A
6. Adjournment

BHJ HAZARD MITIGATION PLAN

HMC MEETING #2 – 1:30 pm

NAME	AGENCY/JURISDICTION	CONTACT
Jeff Harvey	JH Consulting, LLC	jharvey@jhcemergency...
Rebecca Springer	Hancock Co Emergency Management	raspringer@yahoo.com
K. Robert Fowler	Brooke EMA	
Mark R. Henne	City of Wellsburg	markrhennecitymgr@comcast.net
Sue Simonetti	City of Wellsburg	mayorsimonetti@comcast.net
A.D. Mark Allen	City of Weirton	Citymanager@cityofweirton.com
John Brown	Brooke-Hancock Regional Planning & Development Council	PO Box 82, Weirton, WV 26062, JBrown@BHJMPC.org
Barb Ziminox	BHJ	bziminox@bhjmpc.org
BJ Defelice	Weirton Area Port Authority	bj.defelice@wapainc.org

BHJ (Region 11) Hazard Mitigation Plan
Stakeholders Meeting #2 – Public Meeting
Minutes

Call to Order: Approximately 1:30 p.m.

Attendance:

- John Brown, BHJ
- Barb Zimnox, BHJ
- Jeff Harvey, JH Consulting
- Mark Henne, City of Wellsburg
- Sue Simanettie, City of Weirton
- A.D. Mastrantoni, City of Weirton
- Rebecca Springer, Hancock County Office of Emergency Management
- Bob Fowler, Brooke County Emergency Management Agency
- BJ DeFelice, Weirton Area Port Authority

Topics Discussed:

- The committee decided to prioritize projects virtually with the jurisdictions rather than at this meeting on account of low turn-out.
- The Consultant provided an update on the plan's progress, which included the following:
  - Risk assessment process involved researching a number of sources of information, including state agencies, newspaper archives, first committee meeting notes, general Internet searches, etc.;
  - Regarding the civil disturbance hazard, the Consultant asked if there were any festivals or other gatherings that could increase the probability of a disturbance; referenced notes from the first committee meeting regarding gang activity and asked for an explanation; and asked if there were any documentable historical occurrences;
  - Regarding the dam failure hazard, the Consultant asked if there were any other structures aside from SCS, USACE, and WVDEP structures;
  - Regarding the hazmat hazard, the Consultant asked for a covered facilities count from Brooke County and if any major historical incidents had occurred. The Consultant also confirmed use of Brooke and Hancock Counties latest commodity flow studies as well as the USEPA's EnviroFacts database.

- General discussion on the risk assessment included the following:
  - A need to note that seismic testing for drilling caused a couple of houses to come off their foundation in Weirton.
  - Note the effects of subsidence on the transportation infrastructure;
  - That gang activity comes from Youngstown and Pittsburg along the 22/30 corridors. Activity also comes from as far away as Chicago, New Jersey, and Philadelphia as part of the drug trade. To date, there have been no major incidents, but there is a need to build awareness.
  - Participants indicated that they were starting to see water impoundments for the natural gas industry, but did not have an inventory of those. The Consultant suggested adding a mitigation project to inventory those locations.
  - Participants indicated that there were approximately 25 covered facilities in Brooke County and that only a couple of minor incidents had occurred, including one (1) at Koppers and transportation incidents along SR 2.

- Committee members discussed the different types of mitigation projects (i.e., prevention, property protection, natural resource protection, emergency services, structural, and public education and awareness).
- Since representatives from Brooke County, Hancock County, Weirton, and Wellsburg were present, the committee reviewed the project list for those jurisdictions and marked all existing projects as “completed”, “deleted”, “on-going”, or “deferred”. Committee members also discussed the addition of new projects. The Consultant noted all discussions of status for inclusion in the plan narrative.
- Mr. DeFelice from the Weirton Area Port Authority gave a presentation on the authority and described, at length, the authority’s “NextGen” project involving wireless access, fiberoptics, etc. This project could be made available to emergency services and mitigate potential communications and information sharing issues.
- No members of the general public attended the meeting.

MITIGATION PLAN AVAILABLE FOR REVIEW

The Brooke-Hancock Regional Planning & Development Council is currently in the process of updating the hazard mitigation plan for Brooke and Hancock Counties.

This plan identifies the hazards to which Brooke and Hancock Counties are susceptible as well as a variety of projects that can be undertaken to lessen the effects of those hazards. A public meeting has been scheduled to review and discuss the plan. The meeting will take place at the offices of the Business Development Corporation of the Northern Panhandle at 3174 Pennsylvania Avenue, Weirton, WV 26062, at 10:00 AM on Friday, October 21, 2011.

The Hazard Mitigation Plan was developed in 2004 and 2005 per federal requirements in Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000.

Int. Oct. 14, 2011

STATE OF WEST VIRGINIA,
COUNTY OF OHIO.

I Connie Bolla *for the publisher of the* ***Intelligencer*** *newspaper published in the CITY OF WHEELING, STATE OF WEST VIRGINIA, hereby certify that the annexed publication was inserted in said newspaper on the following dates:*

10-14-11

Given under my hand this 17th

day of Oct, 2011

Sworn to and subscribed before me this 17th

day of October, 2011 *at WHEELING, OHIO COUNTY, WEST VIRGINIA*

Kathy Dayton
Notary Public

of, in and for OHIO COUNTY, WEST VIRGINIA.

My Commission expires April 19, 2021

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
KATHY DAYTON
425 Fishers Lane
Mozart
Wheeling, West Virginia 26003
My Commission Expires Apr. 19, 2021

BHJ Hazard Mitigation Plan
Public Comment Form

The BHJ Hazard Mitigation Plan has been developed as per the requirements of Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. As part of that requirement, members of the public must have an opportunity to review and comment on the document. During the preparation of the plan, member counties held a number of public meetings to allow the public a chance to review the existing county documents and make suggestions regarding improvements. This form is provided to the public to record comments on the updated version of the plan. Following your review of the plan, please use this document to mark any strengths or areas for improvement.

1. List any hazards you feel were not included in the plan but should have been.

_____

_____

1a. Why should these be included?

_____

_____

2. What hazards are in the plan that should be removed?

_____

2a. Why?

_____

3. List any projects you feel should have been included in the plan but were not.

_____

_____

3a. Why?

_____

_____

4. What projects are in the plan that should be removed?

_____

4a. Why?

_____

5. Please list any general comments you have.

_____

_____

_____

6. In what jurisdiction (i.e., city, town, or unincorporated area) do you live?

_____

THANK YOU for completing this form. If you would like to leave your name and other contact information, you may do so on the back of this sheet.

BJH HAZARD MITIGATION PLAN
PROJECT PRIORITIZATION

FEMA Region III and the WVDHSEM are requesting a numeric prioritization of mitigation projects. To accomplish this, we do not have to rank all projects from one (1) to the end. Instead, we can prioritize the hazards identified by the plan and then prioritize projects under the individual hazards.

INSTRUCTIONS

Everyone: Table 1 lists the hazards identified by the mitigation plan. Place a number to the right of the hazard corresponding to what you feel are appropriate priorities. *The hazard to which you feel your county is most vulnerable would receive a priority of "1".* The hazard to which you feel that county is least vulnerable would receive a priority "14". *Each hazard must have a different priority*, creating a list that runs from 1 (most vulnerable) to 14 (least vulnerable).

For Your County: County project lists follow in the second table. You only need to prioritize projects for your county. Find your county. If you have more than one (1) project identified, mark a "1" to the right of the highest priority project for your jurisdiction *under each objective* (objectives are marked in bold text). Continue ranking all projects for only your jurisdiction. (For example, if you have three [3] projects under **Objective 1**, you will assign a 1, 2, and 3 priority. If you have five [5] projects, you would assign priorities 1 through 5.) Repeat for each bolded objective. (As a note, objectives are more general in nature in Brooke County and typically hazard-based in Hancock County.)

Table 1: HAZARDS

Civil Disturbance	11
Dam Failure	14
Drought	7
Earthquake	13
Flooding	1
Hailstorm	5
Hazardous Material Incident	4
Land Subsidence	9
Radiological Hazard	8
Terrorism	12
Thunderstorms	2
Wildfire	10
Wind and Tornados	3
Winter Storms	6

Table 2: COUNTY MITIGATION PROJECTS

BROOKE COUNTY (40 total projects)

Develop and implement a hazard mitigation committee.

1. *Project 1C.1.1*: Identified planning team will be involved in every aspect of the planning process, in all future endeavors

2. *Project 1C.2.1:* Organize cooperation between the participating municipalities in Brooke County

3. *Project 1C.4.1:* Review risk assessment, and update accordingly

4. *Project 1C.4.2:* Review risk rankings and update accordingly

5 .*Project 1C.5.4:* With obtained data from above, provide losses for each specific hazard

6. *Project 1C.6.1:* Work with critical facilities and local entities to create revised listings of critical facilities within the county on a regular basis

7. *Project 1C.7.1:* Work with all stakeholders to develop comprehensive listings of all assets potentially affected by each hazard

8. *Project 1C.8.1:* Obtain data to support both countywide and local mitigation plans and programs

9. *Project 1C.8.2:* Reassess the rating system provided and update, if needed

Develop an implementation strategy.

1. *Project 3C.1.1*: Include parties responsible for the monitoring and evaluation of mitigation and other projects in an "After-Action Review" (AAR) process to include an Improvement Plan (IP) with a schedule for implementation and completion

Develop a public outreach program.

2. *Project 4C.2.1*: Encourage participation by including public notices in newspapers and involve the mass media of the area

Improve upon protection from man-made hazards.

9. *Project 5C.1.2*: Create materials that are targeted towards tourist population

4. *Project 5C.1.3*: Utilize the media for the distribution and publication of hazard information

5. *Project 5C.1.4*: Create a public speaking series on hazard-related topics

6. *Project 5C.1.6*: Work with Brooke County Schools to promote hazard mitigation

education and awareness and discuss ways to better integrate mitigation into the curriculum

7. *Project 5C.1.7*: Work with non-governmental organizations (youth, service, professional, religious, etc.) to promote mitigation education and awareness

3. *Project 5C.1.8*: Develop an Emergency Public Information (EPI) program that will provide critical information to the general public in the event of an emergency, particularly as it relates to flooding

1. *Project 5C.3.1*: Ensure that all shelters have adequate emergency power resources

2. *Project 5C.3.2*: Develop adequate emergency shelter and evacuation plans for animals (domestic pets, livestock, and wildlife)

8. *Project 5C.4.3*: Conduct annual tabletop disaster exercises with local law enforcement, emergency managers, city and county officials, and other disaster response agencies

10. *Project 5C.4.4*: Provide information about local, regional, state, and federal training opportunities to fire departments, Emergency Medical Services (EMS), ambulance services, and other emergency responders

Reduce current and future risks.

3. *Project 6C.1.2*: Secure additional training and education for local land use planners, zoning administrators, and related officials for proper floodplain management techniques and other flood prevention activities

2. *Project 6C.2.1*: Provide additional training to county and municipal development officials on NFIP requirements

1. *Project 6C.3.1:* Encourage all local governments to adopt and enforce building codes and other regulations which require new construction activities to conform to applicable snow load specifications

Enhance mitigation through comprehensive emergency management practices.

1. *Project 7C.1.1:* Utilize the Brooke County Emergency Management Agency (BCEMA) to facilitate communication and coordination between emergency teams in the county

3. *Project 7C.2.1:* Redefine roles, responsibilities, and tasks of emergency response agencies and other tasked organizations, if needed

2. *Project 7C.3.1:* Conduct drills, exercises, and other training events to ensure that

the county's emergency response forces are property trained for hazard events

Reduce impact from natural disasters.

4. *Project 8C.1.1:* All local units of government will continue to maintain their membership in the NFIP

2. *Project 8C.1.2:* Obtain updated information on the number of NFIP policyholders in Brooke County and its municipalities

1. *Project 8C.1.3:* Conduct outreach efforts to educate the public about the NFIP and its requirements

3. *Project 8C.2.3:* Identify owners of repetitive loss properties that may be willing to participate in future property acquisition and relocation projects

Develop better hazard data.

3. *Project 9C.2.1:* Work with West Virginia Division of Highways (WVDOH) to identify areas of frequent roadway flooding and develop mitigation strategies

4. *Project 9C.2.2:* Contact commercial rail lines to ensure that measures are being taken to address hazard risks

2. *Project 9C.3.1:* Identify strategies to mitigate risks from the transportation and/or storage of hazardous materials in Brooke County

1. *Project 9C.4.1:* Work with local critical facilities to ensure they develop and maintain response plans that are compatible with the county's EOP

5. *Project 9C.6.1:* Project extent of damage of fall-out areas that would be affected by such a catastrophe

Reduce flood damages.

1. *Project 10C.1.3:* Identify the most appropriate mitigation strategy for each segregated property: acquisition, relocation, or no action

3. *Project 10C.1.4:* Provide mapping and pertinent information/maps to appropriate units of local government

4. *Project 10C.1.5:* Develop cost estimates and project budgets for all of the identified properties and the selected strategies

2. *Project 10C.2.1:* Ensure all lifeline agencies or departments have a comprehensive understanding of flood hazard risks and are coordinating efforts with other flood mitigation activities

BJH HAZARD MITIGATION PLAN
PROJECT PRIORITIZATION

FEMA Region III and the WVDHSEM are requesting a numeric prioritization of mitigation projects. To accomplish this, we do not have to rank all projects from one (1) to the end. Instead, we can prioritize the hazards identified by the plan and then prioritize projects under the individual hazards.

INSTRUCTIONS

Everyone: Table 1 lists the hazards identified by the mitigation plan. Place a number to the right of the hazard corresponding to what you feel are appropriate priorities. *The hazard to which you feel your county is most vulnerable would receive a priority of "1".* The hazard to which you feel that county is least vulnerable would receive a priority "14". *Each hazard must have a different priority*, creating a list that runs from 1 (most vulnerable) to 14 (least vulnerable).

For Your County: County project lists follow in the second table. You only need to prioritize projects for your county. Find your county. If you have more than one (1) project identified, mark a "1" to the right of the highest priority project for your jurisdiction *under each objective* (objectives are marked in bold text). Continue ranking all projects for only your jurisdiction. (For example, if you have three [3] projects under **Objective 1**, you will assign a 1, 2, and 3 priority. If you have five [5] projects, you would assign priorities 1 through 5.) Repeat for each bolded objective. (As a note, objectives are more general in nature in Brooke County and typically hazard-based in Hancock County.)

EXAMPLES ARE LISTED ON THE NEXT PAGE.

SAMPLE Table 1: HAZARDS

Dam Failure	6
Drought	8
Earthquake	11
Flooding	1
Hailstorm	12
Hazardous Material Incidents	7
Land Subsidence	4
Terrorism	2
Thunderstorms	9
Wildfire	10
Wind and Tornados	3
Winter Storms	2

SAMPLE Table 2: MITIGATION PROJECTS

LAND SUBSIDENCE (1 project) Coordinate with the WVDEP, Division of Mineral Resources Management, Office of Abandoned Mine Lands and Reclamation to undertake reclamation projects if subsidence occurs at a specific location.	*1*
THUNDERSTORMS (3 projects) Coordinate with the NWS to warn residents of impending severe thunderstorm conditions.	*2*
Encourage the use of the EAS on commercial radio, television, and cable systems to send out emergency information targeted to specific areas.	*1*
Ensure that surge protection, such as surge protectors and grounding, has been installed on all critical electronic equipment owned by county government.	*3*

Table 1: HAZARDS

Civil Disturbance	14
Dam Failure	11
Drought	7
Earthquake	8
Flooding	1
Hailstorm	5
Hazardous Material Incident	10
Land Subsidence	6
Radiological Hazard	12
Terrorism	13
Thunderstorms	3
Wildfire	9
Wind and Tornados	4
Winter Storms	2

Table 2: COUNTY MITIGATION PROJECTS

HANCOCK COUNTY (20 total projects)

Reduce losses from droughts.

Project 1F.1.4: Install additional waterlines as a long-term strategy 1

Project 1F.4.3: Reduce costs for the water customer 4

Project 1F.4.4: Identify grants for federal funding 3

Project 1F.5.1: Identify funding sources to support connectivity 2

Reduce losses from earthquakes.

Project 2F.1.2: Provide public education via a handout concerning earthquake unpredictability 1

Project 2F.2.1: Identify critical facilities throughout the county 2

Reduce losses from flooding.

Project 3F.1.1: Evacuate citizens 1

Project 3F.1.2: Determine if citizens are eligible for flood insurance and ensure participation 2

Reduce losses from land subsidence.

Project 4F.3.1: Work with the WVDOH to install signs on roadways 1

Project 4F.3.2: Use law enforcement to alleviate the problem on roadway "pinch points" 2

Reduce losses from winter storms.

Project 5F.1.1: Pre-establish points in the county where people can go to get help. Conduct public education and awareness to make sure people have that information available to them 1

Project 5F.1.3: Identify funding for necessary equipment 2

Reduce losses from severe wind.

Project 6F.1.1: Evaluate if additional publications beyond the "Getting Ready" booklet is necessary 1

Reduce losses from wildfires.

Project 7F.1.1: Examine wildfires as a weather-related condition 1

Project 7F.1.2: Provide public information about campfires 2

Project 7F.2.2: Examine human resources versus existing equipment 3

Project 7F.3.1: Identify funding resources for the flags and training for the public on their use 4

Undertake general mitigation projects.
Project 8F.2.2: Determine which assets are located in hazard areas 1

Project 8F.2.3: Collect content and operational values for critical facilities 2

Project 8F.2.4: Calculate loss estimates based on the formula provided in FEMA's "how-to" guides 3

Adoption Process and Documentation

The Brooke County All Hazards Mitigation Plan was developed as a multi-jurisdictional plan; therefore, to meet the requirements of Section 322 the final plan was adopted by each of the municipalities as well as the county. This section documents the adoption process of each local government in order to demonstrate compliance with this requirement. The plan was adopted prior to being submitted to FEMA Region III for final review.

Resolution # 1

Adopting the Brooke County All Hazards Mitigation Plan

Whereas, City OF Wellsburg recognizes the threat that natural hazards pose to people and property; and

Whereas, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

Whereas, an adopted all hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

Whereas, City OF Wellsburg participated jointly in the planning process with the other local units of government within the County to prepare an All Hazards Mitigation Plan;

Now, therefore, be it resolved, that the City OF Wellsburg, hereby adopts the Brooke County All Hazards Mitigation Plan as an official plan; and

Be it further resolved, that Brooke County will submit on behalf of the participating municipalities the adopted All Hazards Mitigation Plan to Federal Emergency Management Agency officials for final review and approval.

Date Passed: 10/27/04

City Manager

Mayor

Adoption Process and Documentation

The Brooke County All Hazards Mitigation Plan was developed as a multi-jurisdictional plan; therefore, to meet the requirements of Section 322 the final plan was adopted by each of the municipalities as well as the county. This section documents the adoption process of each local government in order to demonstrate compliance with this requirement. The plan was adopted prior to being submitted to FEMA Region III for final review.

Resolution # ______

Adopting the Brooke County All Hazards Mitigation Plan

Whereas, the City of Follansbee, WV recognizes the threat that natural hazards pose to people and property; and

Whereas, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

Whereas, an adopted all hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

Whereas, the City of Follansbee, WV participated jointly in the planning process with the other local units of government within the County to prepare an All Hazards Mitigation Plan;

Now, therefore, be it resolved, that the City of Follansbee, WV, hereby adopts the Brooke County All Hazards Mitigation Plan as an official plan; and

Be it further resolved, that Brooke County will submit on behalf of the participating municipalities the adopted All Hazards Mitigation Plan to Federal Emergency Management Agency officials for final review and approval.

Date Passed: 10-29-04

[signature]
City Manager

[signature]
Mayor

RESOLUTION

RESOLUTION AUTHORIZING CITY OF WEIRTON TO ADOPT THE BROOKE COUNTY ALL HAZARDS MITIGATION PLAN

WHEREAS, the City of Weirton recognizes the threat that natural hazards pose to people and property; and,

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and,

WHEREAS, an adopted all hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and,

WHEREAS, the City of Weirton participated jointly in the planning process with the other local unites of government within the County to prepare an All Hazards Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMON COUNCIL OF THE CITY OF WEIRTON, BROOKE AND HANCOCK COUNTIES, WEST VIRGINIA, that the City of Weirton is hereby authorized to adopt the Brooke County All Hazards Mitigation Plan as an official plan.

BE IT FURTHER RESOLVED, that Brooke County will submit, on behalf of the participating municipalities, the adopted All Hazards Mitigation Plan to Federal Emergency Management Agency (FEMA) officials for final review and approval.

Date: December 13, 2004

Mayor

ATTEST:

City Clerk

II. Adoption Process and Documentation

The Brooke County All Hazards Mitigation Plan was developed as a multi-jurisdictional plan; therefore, to meet the requirements of Section 322 the final plan was be adopted by each of the municipalities as well as the county. This section documents the adoption process of each local government in order to demonstrate compliance with this requirement. The plan was adopted prior to being submitted to FEMA Region III for final review.

Resolution # _____

Adopting the Brooke County All Hazards Mitigation Plan

Whereas, Brooke County Commission recognizes the threat that natural hazards pose to people and property; and

Whereas, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

Whereas, an adopted all hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

Whereas, Brooke County Commission participated jointly in the planning process with the other local units of government within the County to prepare an All Hazards Mitigation Plan;

Now, therefore, be it resolved, that the Brooke County Commission, hereby adopts the Brooke County All Hazards Mitigation Plan as an official plan; and

Be it further resolved, that Brooke County will submit on behalf of the participating municipalities the adopted All Hazards Mitigation Plan to Federal Emergency Management Agency officials for final review and approval.

Passed: 12/13/04

John A Caimell

President, Brooke County Commission

Resolution

Whereas, the Hancock County Commission, Hancock County Assessor's Office, City of Weirton, City of New Cumberland, City of Chester, and Brooke-Hancock-Jefferson Metropolitan Planning Commission are participating in the planning and adoption of a multi-jurisdictional plan to meet the requirements of Section 322 of the Disaster Mitigation Act of 2000.

Whereas, this plan will only address natural disasters such as flood, dam failure, drought, landslides, tornado, etc.

Whereas, the Hancock County Commission agrees to adopt the completed multi-jurisdictional plan upon completion.

Whereas, funding assistance is being provided for the planning process and the plan must be in place to receive future assistance from the Federal Emergency Management Agency, for mitigation of natural disasters.

Now, therefore be it resolved, that the Hancock County Commission commits to participating in a multi-jurisdictional plan.

Adopted by the Hancock County Commission

on the 18th day of November, 2004 it is retroactive to November 1st.

Adopting the Hancock County Hazard Mitigation Plan

Whereas, Hancock County Commission recognizes the threat that natural

Hazards pose to people and property; and

Whereas, undertaking hazard mitigation actions before disasters occur will reduce the

potential for harm to people and property and save taxpayer dollars; and

Whereas, an adopted all hazards plan is required as a condition of future grant funding

for mitigation projects; and

Whereas, Hancock County Commission participated jointly in the

planning process with the other local units of government within the County to prepare a

Hazard Mitigation Plan;

Now, therefore, be it resolved, on the 18th day of November, in the year of 2004, that the Hancock County Commission, hereby adopts the Hancock County Hazard Mitigation Plan as an official plan; and

Be it further resolved, that the Hancock County Commission will submit on behalf of the participating municipalities the adopted Hazard Mitigation Plan to Federal Emergency Management Agency officials for final review and approval.

CITY OF NEW CUMBERLAND

P.O. BOX 505 · NEW CUMBERLAND, WEST VIRGINIA 26047 · (304) 564-3383 · FAX (304) 564-3777

RESOLUTION

WHEREAS, the Hancock County Commission, Hancock County Assessor's Office, City of Weirton, City of New Cumberland, City of Chester, and Brooke-Hancock-Jefferson Metropolitan Planning Commission are participating in the planning and adoption of a multi-jurisdictional plan to meet the requirements of Section 322 of the Disaster Mitigation Act of 2000.

WHEREAS, this plan will only address natural disasters such as flood, dam failure, drought, landslides, tornado, etc.

WHEREAS, the Hancock County Commission agrees to adopt the completed multi-jurisdictional plan upon completion.

WHEREAS, funding assistance is being provided for the planning process and the plan must be in place to receive future assistance from the Federal Emergency Management Agency, for mitigation of natural disasters.

NOW, therefore be it resolved, that the City of New Cumberland commits to participating in a multi-jurisdictional plan.

ADOPTED by the **City of New Cumberland** on the 16th day of September, 2002.

Arthur L. Watson, Mayor

Tamera M. Jenkins, City Clerk