Multi-Jurisdictional Hazard Mitigation Plan

Updated 2016

JH Consulting LLC

REGION 4
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

RELEASED 2016

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1.0 INTRODUCTORY MATERIALS

INTRODUCTION

This section will present an introduction to the Hazard Mitigation Plan as well as define the authority, scope and purpose of the plan.

Plan Introduction

The *Region 4 Multi-Jurisdictional Hazard Mitigation Plan* is a multi-jurisdictional plan that details natural hazards that threaten Region 4 and its various municipalities. The plan fulfills the requirements set forth by the *Mitigation Act of 2000* (DMA, 2000). This Act requires counties to formulate a hazard mitigation plan in order to be eligible for mitigation funds made available by the Federal Emergency Management Agency (FEMA).

Plan Authority

This 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 under Title 44: Emergency Services, Part 201.6. Specific reference is made to the Local Mitigation Planning Handbook (USDHS/FEMA, 2013). The West Virginia Division of Homeland Security and Emergency Management (DHSEM) further monitored the original planning as well as subsequent updating processes. The Region 4 Planning and Development Council acted as the coordinating agency for the completion of this plan at the local level.

Plan Scope

The *Region 4 Multi-Jurisdictional Hazard Mitigation Plan* includes all unincorporated areas of Region 4 as well as the incorporated areas of all municipalities within the region. The plan addresses natural hazards identified by FEMA, West Virginia DHSEM and the Region 4 mitigation planning team. All hazards that have or can affect the residents of Region 4 have been analyzed. Hazard mitigation objectives, goals and projects are discussed, as are project lead agencies and potential funding sources.

Plan Purpose

The purpose of the *Region 4 Multi-Jurisdictional Hazard Mitigation Plan* is to identify and evaluate all natural hazards that can and may affect Region 4 and to describe mitigation strategies to address these hazards.

1.1 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.

This plan was developed in accordance with Part 201.6 of 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. Several resources were used during the development of the plan, including the United States Department of Homeland Security (DHS) / Federal Emergency Management Agency's (FEMA) *Local Mitigation Planning Handbook* (USDHS/FEMA, 2013), and the governing regulations in the Code of Federal Regulations.

To guide the completion of the plan at the local level, a multi-jurisdictional core planning team was established. The final steering committee that guided the 2016 update process included the following.

ORGANIZATION	REPRESENTATIVE
Region 4 Planning & Development Council	Cassie Hughart, Project Assistant
Region 4 Planning & Development Council	Jamie Meadows, Administrative Assistant
Fayette County Emergency Management	Kevin Walker, Director
Greenbrier County Homeland Security and Emergency Management	Al Whitaker, Director
Greenbrier County Homeland Security and Emergency Management	Paula Brown, Deputy Director
Nicholas County Homeland Security and Emergency Management	(Various), Director
Pocahontas County Homeland Security and Emergency Management	Michael O'Brien, Director
Webster County Office of Emergency Services	Richard Rose, Director
West Virginia Division of Homeland Security and Emergency Management (DHSEM)	Teresa White, Area Liaison

1.1.1 Current Update Process

As noted in the introduction, the Region 4 Planning and Development Council (PDC) served as the coordinating agency for this update. To that end, the Region 4 PDC sought support for the planning effort, identifying the resources needed to update the plan (including serving as the primary point of contact interfacing with the county's consultant working on the project), and re-engaging governmental organizations and other technical expertise available in the region.

To update the plan, the Region 4 PDC assembled the planning committee cited above. The Region 4 PDC sought to make the committee as broadly-experienced and representative as possible and ensured opportunities for the following types of organizations to participate: emergency management, the fire service, parks and recreation officials, planning districts of various types, transportation organizations, schools, public works, and law enforcement. Ultimately, the following agencies/organizations were invited to send representatives to planning committee meetings. Those that attended are documented on sign-in sheets in Appendix 1.

<u>County Organizations</u>

Fayette County Emergency Management
Greenbrier County Homeland Security and Emergency Management
Nicholas County Homeland Security and Emergency Management
Pocahontas County Homeland Security and Emergency Management
Webster County Office of Emergency Services
Fayette County Board of Education
Nicholas County Commission
Pocahontas County Commission

<u>Governmental Jurisdictions</u>

Town of Fayetteville
Town of Webster Springs

<u>Non-Profit Organizations</u>

Greenbrier Valley Economic Development Council

Other

Federal Emergency Management Agency
West Virginia Division of Homeland Security and Emergency Management
Stafford Consulting
Valcon, Inc.
Neathawk Lumber
Community Trust Bank
Friends-R-Fun Child Care Center
General Public (x6)

Additionally, the Region 4 PDC invited external stakeholders to review the final draft of the plan and provide comments, thus participating in the process. These stakeholders consisted of the following neighboring Planning and Development Councils:

- Region 1 PDC
- Region 3 PDC (Regional Intergovernmental Council)
- Region 7 PDC

All municipal jurisdictions in Region 4 were invited to participate in the update. As noted in the committee membership above (and as per copies of sign-in sheets in Appendix 1), many of them did participate. Others, though, were unable to be as active in meetings. Following federal approval pending adoption, the county and participating municipalities intend to formally adopt this plan by resolution or ordinance.

1.1.2 Committee Involvement

On July 15, 2015, Region 4's contractor attended a full regional council meeting to discuss and formally kick-off the project. The contractor explained the dual committee structure (i.e., the use of the council as the full planning committee and a subset of county-level emergency managers as a steering committee more closely involved in the plan composition). The contractor then entertained questions from council members.

The core planning committee met at the Region 4 PDC office in Summersville on four occasions during the update of the plan. Meeting dates included the following:

- October 26th, 2015
- March 23rd, 2016
- June 14th, 2016
- October 12th, 2016

The agenda for the first meeting included an introduction to the mitigation planning process and a review of hazards that threaten the counties and municipalities that make up Region 4. During the second committee meeting, the draft materials provided were reviewed and ongoing projects were discussed among the committee members. Sign-in sheets for the meetings are included in Appendix 1.

Steering committee membership involved more than just meeting attendance. Members were given tasks at the conclusion of the each meeting, which were predominantly comprised of requests to collect jurisdiction-specific data. For instance, the consultant provided members with copies of the asset inventory sheets for the five counties within the region and asked them to check the lists for accuracy. Members were asked to add additional assets that had been built since the last plan update and delete those that were defunct. This same process was used for updating the project lists found in the prior version of the plan. Steering committee members were asked to determine the status of these projects and report this back to the consultant, as well as develop new projects to be included. The members were also asked to work with the various municipalities within their counties to update the municipal project lists.

In addition to the steering committee meetings, Region 4's consultant attended the full regional council's summer dinner meeting. An update on the planning process to date and the steps going forward were discussed, and questions were entertained. Additionally at this meeting, representatives from FEMA's Region 3 office and the West Virginia Department of Homeland Security and Emergency Management (WVDHSEM) gave updates on flood recovery and future mitigation efforts.

A number of existing plans and reports were reviewed to (a) identify any obvious inconsistencies between other development and mitigation efforts, (b) as

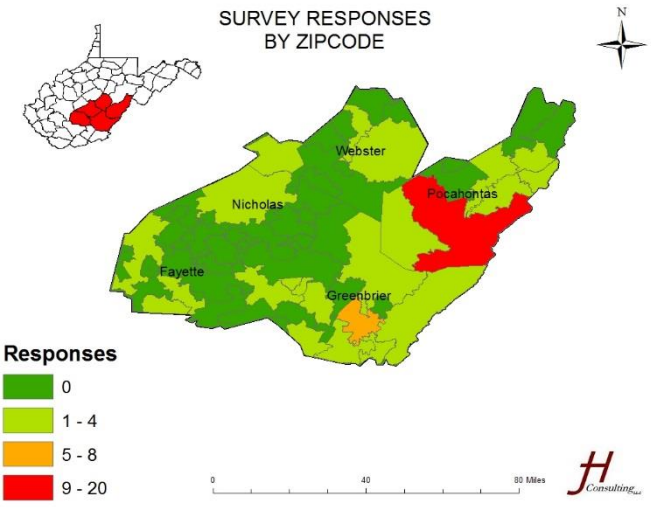
baseline information for such sections as Analyzing Development Trends, and (c) to support discussions surrounding mitigation projects. Those documents included the following.

DOCUMENT TYPE	DOCUMENT CITATION	HOW INCORPORATED INTO THE PLAN
Plan	JH Consulting. (2011) *Region 4 PDC Multi-Jurisdictional Hazard Mitigation Plan.* Online. http://www.dhsem.wv.gov/MitigationRecovery/Documents/Region%20IV.pdf	Used as a basis for past plans, HIRA, vulnerability analysis and mitigation strategy.
Plan	Sirk/Ford Initiative. (2011) 2011 Comprehensive Plan Ammendment Fayette County, West Virginia. Online. http://www.fayettecounty.wv.gov/Documents/2011_Fayette_County_WV_Comprehensive_Plan_Amendment.pdf	Used to identify targeted development areas,
Plan	(2013) *Fayetteville Comprehensive Plan Update. Online. https://fayettevilleplan.files.wordpress.com/2013/09/entire-draft-plan.pdf*	Used to identify targeted development areas,
Plan	(2014) *Greenbrier County Comprehensive Plan.* Online. http://greenbriercounty.net/wp-content/uploads/comp-plan1.pdf	Used to identify targeted development areas,
Plan	(2015) *City of Lewisburg Comprehensive Plan Update.* Online. http://www.lewisburg-wv.com/DocumentCenter/ComprehensivePlan.aspx	Used to identify targeted development areas,
Plan	Sirk/Ford Initiative. (2012) *City of Oak Hill Update to the 1968 Comprehensive Plan.* Online. http://cityofoakhill.homestead.com/Updated_Comprehensive_Plan_5-18-2012.pdf	Used to identify targeted development areas,
Plan	Bedard Consulting. (2013) *A Town Built to Carry On. Building Great Things Since 1906.* Online. http://www.rainelle-wv.com/planning-and-zoning/	Used to identify targeted development areas,
Report	Region 4 Planning and Development Council. (2016) *Comprehensive Economic Development Strategy 2016 Update.* Online http://media.wix.com/ugd/d85018_7772b51bb5b24701a829ab3903986922.pdf	Used to identify targeted development areas,

DOCUMENT TYPE	DOCUMENT CITATION	HOW INCORPORATED INTO THE PLAN
Plan	(2013) *Recommended Plan for Summersville, WV.* Online. http://www.summersvillewv.org/web_copy/Final_Plan.pdf	Used to identify targeted development areas,
Study	JH Consulting. (2011) Fayette County Commodity Flow Study.	Used to identify hazardous materials risks.
Study	JH Consulting. (2015) Greenbrier County Commodity Flow Study.	Used to identify hazardous materials risks.
Study	JH Consulting. (2007). Nicholas County Commodity Flow Study	Used to identify hazardous materials risks.
Study	JH Consulting. (2007). Webster County Commodity Flow Study	Used to identify hazardous materials risks.

1.1.3 Engaging the Public

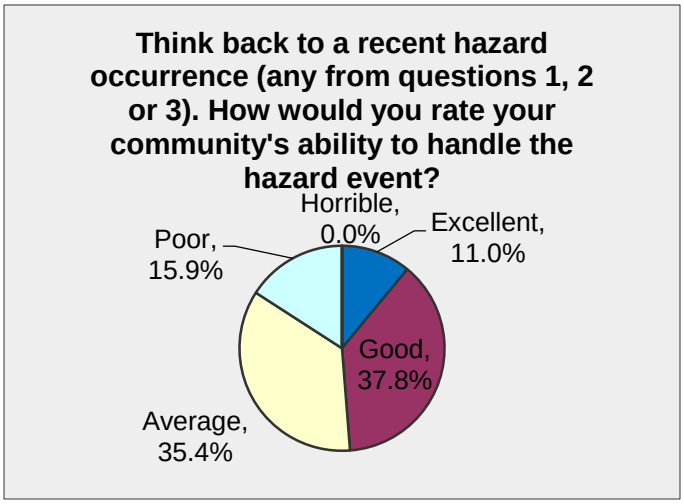
The Region 4 PDC, and the members of the core committee, coordinated multiple ways for the public to engage in the hazard mitigation plan update process. Public meetings were held in all five counties within Region 4. Meetings were publicized through traditional media, social media, and on the Region 4 website. These meetings were held during scheduled county LEPC meetings. Attendees included members of the public, governmental representatives, representatives of non-profit agencies, and representatives of local private entities. The existing HMP was made available on the Region 4 website for public review. Examples of announcements of these meetings,



and attendance records, can be found in Appendix 1.

In order to gain more input on hazard mitigation knowledge and attitudes from the citizens in Region 4, the Region 4 PDC published an online survey using the "Survey Monkey" website (www.surveymonkey.com). This survey was widely advertised through social media as well as through traditional media, and was posted on the Region 4 PDC's website. Examples of these postings can be found in Appendix 1. The survey was available to the public between February and June of 2016. Eighty-six responses were recorded in that time frame. The image above shows the breakdown of respondents by zip code (n=72).[i] Nearly 60% (59.2) of respondents were between 45 and 64 years of age and the same percentage have lived in their community for over 20 years. The majority of respondents (57.1%) were female and nearly 98% (97.5) had graduated high school, with 42% having obtained a higher degree. The raw data for these results, and for the other questions included in the survey, can be found in Appendix 2.

Respondents answered a variety of questions regarding their perceptions of hazards that threaten their community. When asked what hazards they believed existed in their community, the most common answer was Winter Storms, with 97% of respondents choosing this hazard. The second most common hazard selected was flooding, chosen by 87% of respondents. Respondents were also asked to choose the three hazards that they consider to be the highest risk to their community. In this instance, flooding was selected the most, by 81% of respondents. Winter Storms followed at 68% and Wind was the third most selected, at 36%. The findings of the risk assessment in Section 2 of this document reinforce these findings; winter storms are highly frequent events, however flooding will typically cause more damage.



Respondents were next asked to rate how they felt their community handled recent hazard events. The chart shows these responses, where nearly half of respondents considered the ability of the community to handle such an event to be either 'Excellent" or "Good". Few residents thought

that the ability of the community was “Poor”, and none considered it “Horrible”.

Nearly 70% (69.5) of respondents received information or warnings from local public officials or emergency management officials during a recent hazard event. Over 80% of these indicated that they received this information via social media, while just over half related that they received information from the radio and test messages (respondents could choose more than one response). Nearly three quarters of those that received this information related that it was both timely and accurate. Over 80% related that the information was also helpful.

Respondents were asked a number of questions to assess their own household preparedness and to assess what mitigation efforts they support and/or have done for their own household. Of the 57 respondents who answered the question, 37% have a completed 72-hour kit (www.ready.gov/build-a-kit) in their household, and 32% have a kit that is either not completed or is out of date. Nearly all of the respondents (93%) have homeowner’s/renter’s insurance. However, 80% of those respondents stated that their insurance does not include flood insurance. Nearly 70% of respondents are both willing to spend their own money on mitigation actives for their home and have performed such activities. Nearly 75% of these have done maintenance or removal and half have repaired or replaced their roof. Additional actions that have been completed by respondents can be found in Appendix 2, under question 14.

1.1.4 Research

Assessing Risk

The research conducted for the risk assessment phase of this update included data from federal, state, higher education, and mass media sources. The research aim was primarily to validate and describe the hazards included for consideration in this plan. Specific sources relative to individual hazards are listed in the appropriate hazard profile contained in Section 2.0.

It is important to note the planning committee’s involvement in the risk assessment process. Committee members guided the inclusion of hazards in the plan; they provided insight as to historical occurrences in their jurisdictions of the included risks. Finally, committee members helped to significantly revise the asset inventory listings for each jurisdiction (as discussed in 1.2.2 above).

Mitigation Plan Development and Update

As noted in 1.2.2 above, the planning committee was intimately involved in updating the mitigation plan. The primary purpose of the first committee meeting was to review the existing hazard list; the second meeting was used to compare the applicability of the project list with updated risk data and to change the project list accordingly. (The project list under consideration was the list from the previous federally-approved version of this plan [2011].)

The county's consultant guided committee members through the process of re-prioritizing mitigation projects. The prioritized list was then presented as an overall mitigation strategy for Region 4 (i.e., each project is listed with a timeframe, potential cost and funding source, and coordinating agency). The project lists can be found in section 3.2.

1.1.5 Implementing the Plan and Monitoring Progress

Region 4's stakeholders realize that the plan must remain viable in order to appropriately guide mitigation in the county. To that end, plan implementation (i.e., the mitigation strategy and project prioritization) are presented in Section 3.0: Action Plan. The monitoring process is presented in Section 4.0: Plan Maintenance Process.

The governing body of all participating jurisdictions will formally adopt this plan by resolution. To streamline that process, the jurisdictions opted to submit the plan, in full, to the West Virginia Division of Homeland Security and Emergency Management as well as the Federal Emergency Management Agency (Region III) *prior to* formal adoption in the hope of receiving an 'Approved Pending Adoption' (APA) designation. With the APA, the jurisdictions will then formally adopt the plan (so that the resolution process only needs to occur once).

1.1.6 Plan Maintenance and Continued Public Participation

See Section 4.0 Plan Maintenance Process for a detailed discussion of monitoring and evaluative efforts.

[i] Not all survey respondents provided their zip code. Some zip codes provided did not match with the database used for mapping. Map represents 87% of respondents.

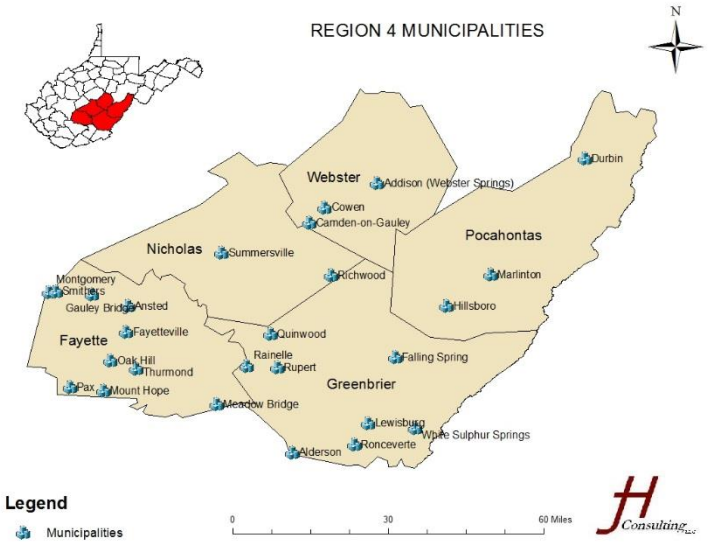
1.2 PLANNING AREA DESCRIPTION

County Geography

The Region 4 Planning and Development Council (PDC) is comprised of five (5) counties which contain twenty-six (26) municipalities. The table on the right shows the various counties and municipalities found within the planning area. The map below illustrates the five county region, and shows the locations of the municipalities within the counties.

Region 4 is located in south eastern West Virginia, with two of its counties bordering with Virginia. The region contains a combined 3,845 square miles, 3,822 square miles being land and 23.6 square miles being water. Greenbrier County is the largest in the region, making up over a quarter of the total land area.

Name	Type	County
Fayette	County	N/A
Greenbrier	County	N/A
Nicholas	County	N/A
Pocahontas	County	N/A
Webster	County	N/A
Montgomery	City	Fayette
Mount Hope	City	Fayette
Oak Hill	City	Fayette
Smithers	City	Fayette
Lewisburg	City	Greenbrier
Ronceverte	City	Greenbrier
White Sulphur Springs	City	Greenbrier
Summersville	City	Nicholas
Ansted	Town	Fayette
Fayetteville	Town	Fayette
Gauley Bridge	Town	Fayette
Meadow Bridge	Town	Fayette
Pax	Town	Fayette
Thurmond	Town	Fayette
Alderson	Town	Greenbrier
Quinwood	Town	Greenbrier
Rainelle	Town	Greenbrier
Renick (Falling Springs)	Town	Greenbrier
Rupert	Town	Greenbrier
Richwood	Town	Nicholas
Durbin	Town	Pocahontas
Hillsboro	Town	Pocahontas
Marlinton	Town	Pocahontas
Camden-on-Gauley	Town	Webster
Cowen	Town	Webster
Webster Springs (Addison)	Town	Webster



County Demographics

The total population of the region was 125,441 as of the 2015 Census estimate. Combined, the region has a population density of 32.64 people per square mile. Fayette County is the most populous county in the region while Pocahontas County is the least populous. Just over 30% of the regional population resides within a municipality. The median age in Region 4, according to the 2010 census, is 43. Twenty percent of the population is under age 18, and 18% of the population is aged 65 and older.

The region is overwhelmingly Caucasian (95%). Those of African-American descent make up 3% of the population while those of Hispanic and Asian descent make up less than 1% of the population (0.8% and 0.2% respectively). The population of the region is almost evenly split between male and female (49.5% male, and 50.4% female).

The median household income for the region is $34,631. Nearly 21% of households live below the poverty line (20.9%). Webster County has the highest level below the poverty line, with 25% of households according to data from the Region 4 PDC.

The region is home to a significant number of vulnerable populations, which includes the homeless, disabled, and those below poverty line, among others. Data from the Region 4 PDC shows that the region has a disabled population of just over 28,000, representing 22% of the population.

Homeless

Those who are homeless, whether chronically or temporarily, can be at increased risk due to their circumstances. The West Virginia Coalition to End Homelessness (WVCEH) publishes the West Virginia Point in Time County Statewide Report yearly, which compiles a number of statistics on homelessness around the state. The 2015 report was published in July of 2015 using data gathered in late January.

Fayette County

In Fayette County there are twelve unsheltered households containing thirteen adults and six children. Of these, seven are veterans, one is chronically homeless and eight have a mental illness.

Greenbrier County

Thirteen households, comprised of thirteen adults, in Greenbrier County were in an emergency shelter. Of those in shelters, 10 are veterans, 5 are chronically homeless, 10 have a mental illness and 1 is a chronic substance abuser.[i]

Greenbrier County has 9 total households that are unsheltered. There are a total of 10 adults and 5 children who are unsheltered. Of these, six are veterans, one is chronically homeless and six have a mental illness.

Nicholas County

There are six households in Nicholas County that are unsheltered, containing six adults. Five of these are chronically homeless, six have a mental illness and two have a history of substance abuse.

Pocahontas County

An estimated two households in Pocahontas County are unsheltered, with a total of two adults. One of these adults is a veteran, both are chronically homeless, both have a mental illness and one has a history of substance abuse.

Webster County

An estimated two households in Webster County are unsheltered, with a total of two adults. It is estimated that there are three chronically homeless persons, two persons with mental illness and one with a history of substance abuse.

Social Vulnerability

The Agency for Toxic Substances and Disease Registry (ATSDR), a division of the Centers for Disease Control and Prevention (CDC) has developed a "Social Vulnerability Index" (SVI) that measures and compares social vulnerability among census tracts. The ATSDR defines social vulnerability as the degree to which certain social conditions in a community, including poverty, car ownership or the number of people in a household, may affect the community's ability to prevent human suffering and financial loss in the event of a disaster (2015). The dataset includes numerous variables, which can be found in Appendix 3, which are from data collected and

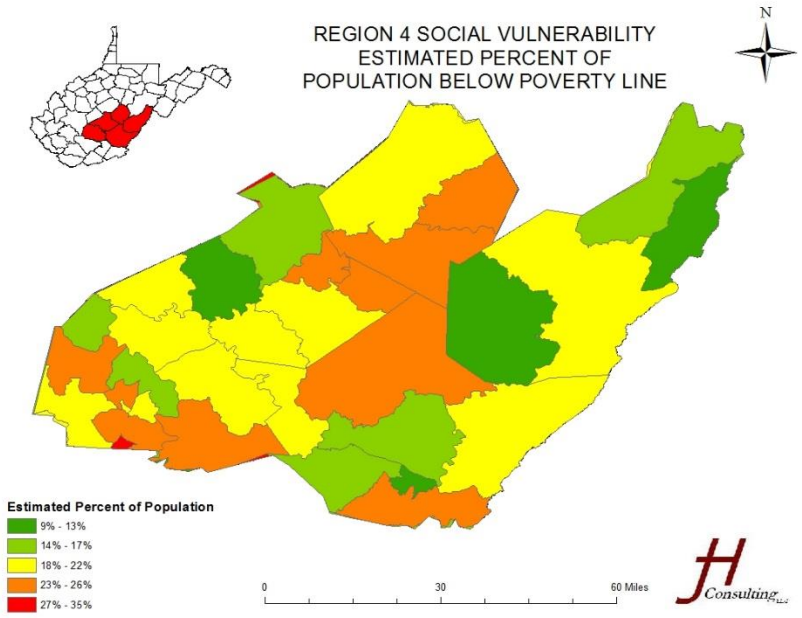
developed by the Census Bureau. The data was collected in the 2010 Census and from the American Community Survey (ACS) that was administered between 2006 and 2010. Due to the timeframe limitations of the data, the maps below do not represent current data but are useful for generalized planning for vulnerable populations.

These variables are grouped into four themes, which include socioeconomic variables, household composition variables, minority status/language variables and housing/transportation variables.

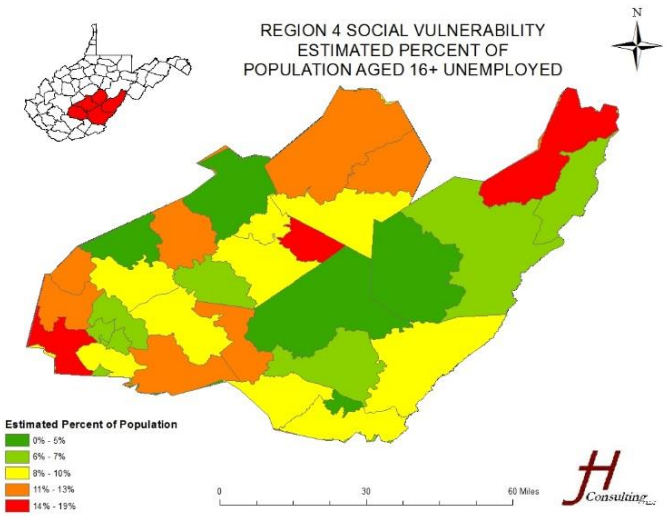
To better describe the planning area, and explore the unique hazards related to its population, eleven of the variables from the SVI will be discussed here and within the relevant hazard profiles. The data is measured in census tracts, which were clipped to the Region 4 parameters. Some census tracts do not line up exactly with county borders.

Socioeconomic Variables

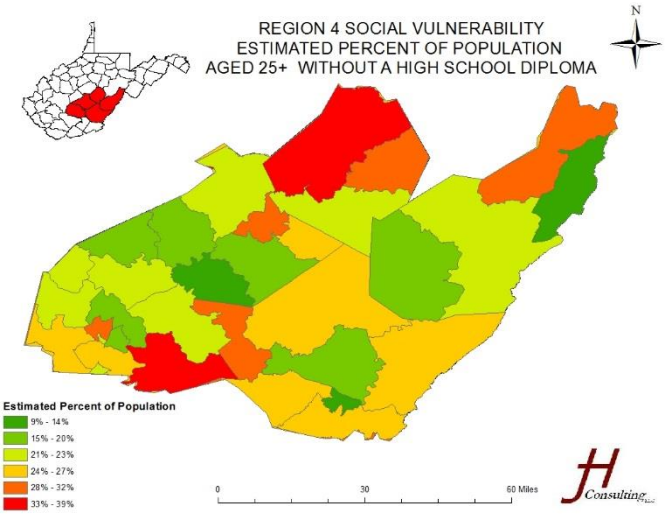
The SVI includes a variable that measures the estimated number of persons who live below the poverty level. Flanagan, Gregory, Hallisey, Heitgerd, and Lewis, researchers at the CDC, who authored *A Social Vulnerability Index for Disaster Management*, explain that "economically disadvantaged populations are disproportionately affected by disasters" (2011.) The map below shows the percentage of the population that is below the poverty line in the various census tracts that make up Region 4.



The poor are less likely to have the income or assets needed to properly prepare for a possible disaster or to recover after a disaster occurs (Cutter et al. 2003.) These areas will need significant support during recovery activities, and could greatly benefit from target mitigation. Closely associated with the poverty level is the unemployment rate, visible above.



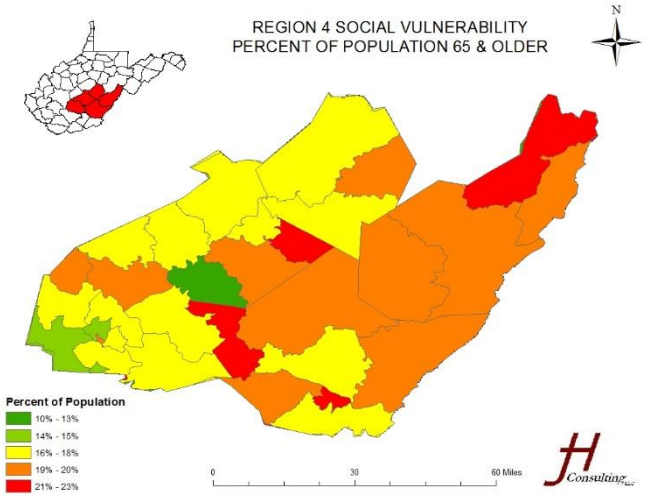
Education is included as a socioeconomic variable, though the relationship between education and vulnerability is not absolutely understood (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.) Education is, however, associated with both income and poverty. Many people without a high school diploma will struggle to find steady, well-paying jobs. This is especially true within the boom and bust cycles associated with the natural resource industries. During boom times these residents can earn decent wages, but when the industry enters a bust cycle there is little to fall back on. The percentage of the population over the age of 25 who have not earned a high school diploma is shown to the right.

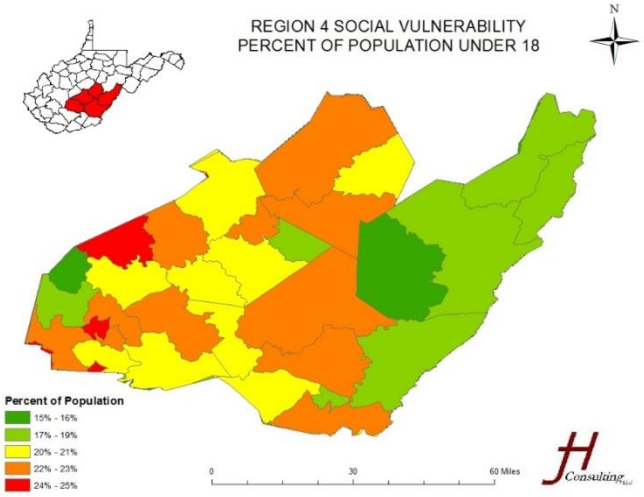


Applying for federal aid and other recovery activities requires the proper completion of complex paperwork. For people with less education, the practical and bureaucratic hurdles to cope with and recover from disaster prove increasingly difficult to surmount (Morrow, 1999.)

Household Composition

The household composition section of the SVI includes variables measuring vulnerable ages, and vulnerable households (single parent households with children under 18.) Vulnerable ages include those under the age of 18 and those over the age of 65. Multiple researchers have concluded that children and elders are the most vulnerable groups in disaster events (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.) Nearly 75% of the victims of Hurricane Katrina were elderly (Phillips, Thomas, Fothergill, & Blinn-Pike, 2010.) The following two maps show the percent of the population that is over the age of 65 and under the age of 18.



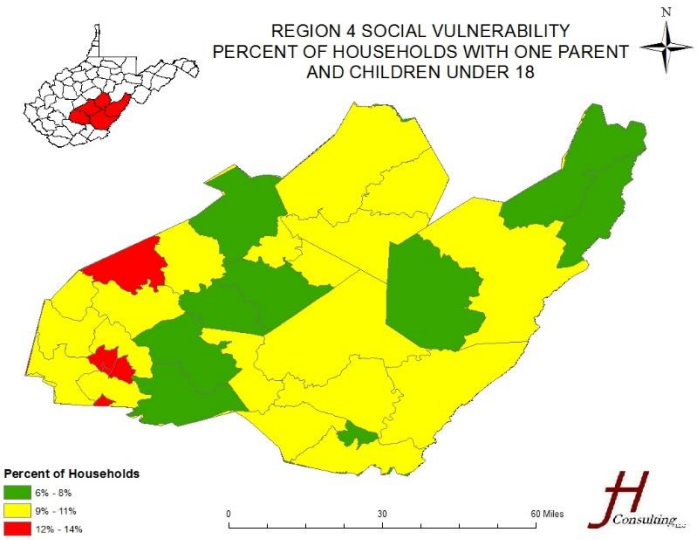


Many elderly citizens have special needs or medical issues that require the assistance of either machines (oxygen concentrators for example) or other, more able bodied people (difficulty walking for example.) As Flanagan, Gregory, Hallisey, Heitgerd, and Lewis point out the family members or neighbors who can typically be counted on to assist the elderly may be either overwhelmed by the disaster or be physically unable to gain access to the elderly. Extended power outages will disproportionality effect elderly populations.

Children, and especially the very young, generally cannot protect themselves and are heavily reliant on their care takers for protection and care. Martin et al. determined that children are rarely incorporated into disaster planning and scenario exercises due to the assumption of parental responsibility (2006.) By not including this population in the planning process responders are not adequately prepared or equipped to deal with children. The map shown on

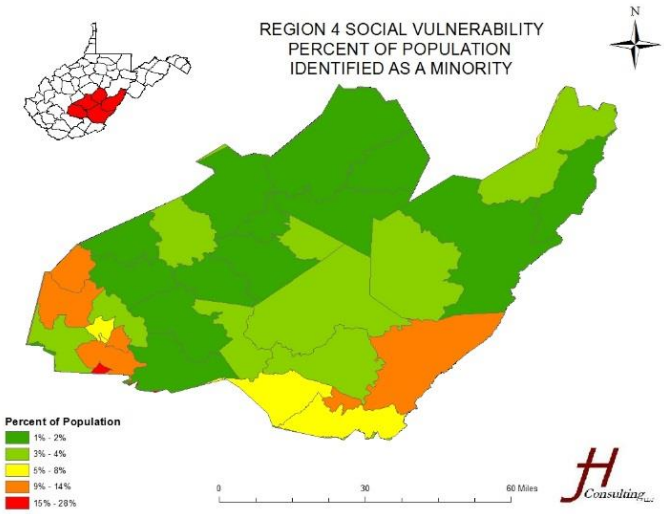
the right above, displays the percentage of the population that is under the age of 18 in Region 4.

The final variable among the housing composition grouping is the percent of households that are single parent households with children who are under the age of 18, which is shown to the right. Similarly to the previous variables, children are among the most vulnerable of populations while single parent households are among the lower socioeconomic status households (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.) These households are especially vulnerable during a disaster because all the caretaker duties fall to one parent, who must also deal with the disaster event and recovery from that event (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.)



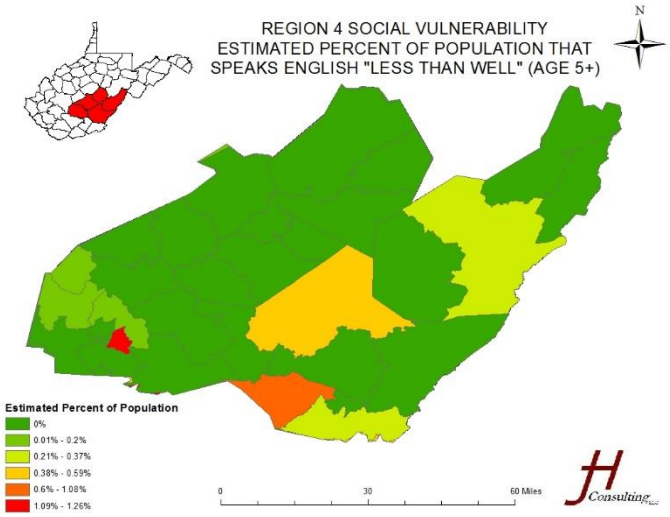
Minority Status/Language

A number of studies have found that the overall marginalization of racial and ethnic minority groups has made these populations more vulnerable during all stages of a disaster (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.) Specifically, studies have shown that populations of African American, Native Americans, Asian, Pacific Islander and Hispanic origin are correlated with higher vulnerability rate (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.) While Region 4 does not have a large



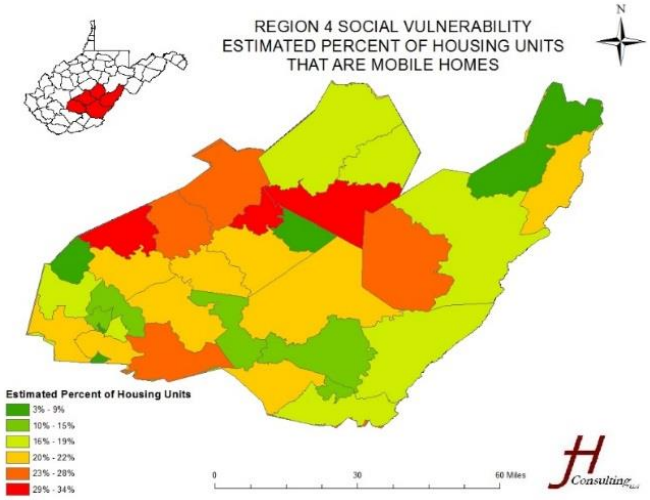
minority population over all, the map above shows some census blocks where there are significant populations.

A specific quality among minorities that will greatly increase their vulnerability during a disaster is an inability to speak or read English well or at all. While there are only two Census tracts where the percentage of the population over the age of 5 who cannot speak English well is over .05% of the total population, this population is exceedingly vulnerable. Without accurate translations, these populations may not understand impending disasters, preparedness warnings, or evacuation notices. Research has shown that immigrant populations are more likely to rely on relatives, friends and neighbors for information, rather than official sources (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.)



Housing/Transportation

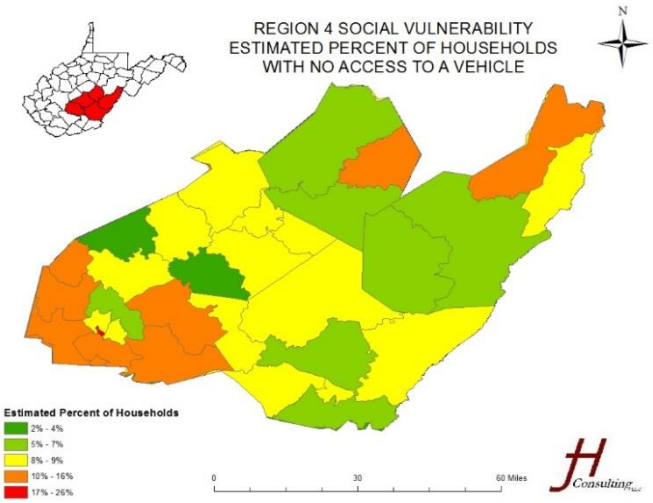
The SVI includes a number of variables that describe housing and transportation. For the purposes of this discussion three variables will be explored: mobile homes, vehicle ownership/access, and institutionalized housing. Housing quality is an important factor in evaluating vulnerability and is closely tied with socioeconomic status and personal wealth (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.) Mobile homes, which typically are inhabited by those of lower



socioeconomic status, are not designed to withstand severe weather and flooding.

Mobile homes are frequently found outside of metropolitan areas, making access difficult in regular conditions and more so during and immediately after a disaster (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.) Mobile homes can also often be found clustered in communities, which increases the overall vulnerability of mobile homes (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.)

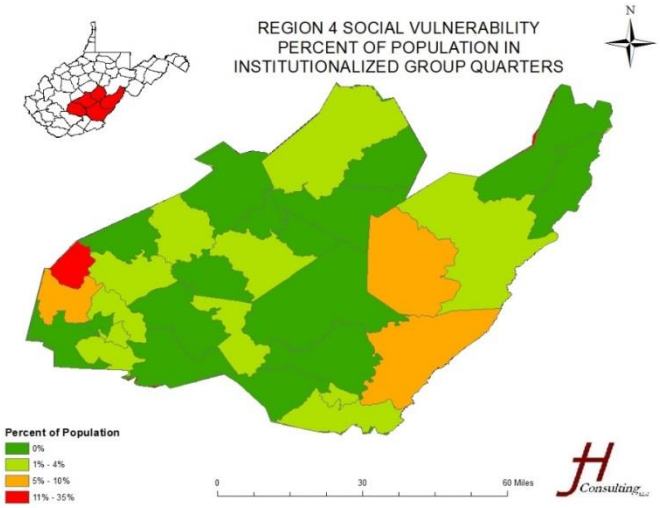
Vehicle ownership or access is crucial to being prepared as well as evacuating, when needed. Those who do not possess or have access to a vehicle will have difficulty going to stores in order to obtain preparedness supplies and will have less capacity to bring those supplies back to their home.



This is even more pronounced in rural areas, which typically lack public transportation networks. As discussed in the transportation section, there are only two public transportation providers in the region. The Mountain Transit Authority (MTA) and the New River Transit Authority (NRTA) are the only public transportation services in the region. The MTA only serves parts of Greenbrier, Nicholas and Webster counties on a Monday – Friday schedule where not every route is run every day. The NRTA serves parts of Raleigh and Fayette Counties and like the MTA is only available during weekdays. Neither service runs after business hours. There are taxi services and other by appointment services in the region that would probably be quickly overwhelmed during an impending disaster such as a snow storm and would not be operating immediately following an event.

The final housing vulnerability variable to discuss is those who live in institutional settings. These include college dorms, farm worker's dormitories,

health institutions, and prisons and present special concerns for evacuations (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.)



Nursing homes and other residential medical facilities are particularly vulnerable. According to Care Pathways, there are 14 nursing homes/skilled care facilities within Region 4. These populations are especially vulnerable due to their special and timely needs and because of understaffing in these institutions in emergencies (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011.) Evacuating these facilities is a time and resource consuming operation, requiring numerous specialty vehicles and staff such as advanced life support ambulances. While these facilities will have backup generators for vital machines, in an extended power outage these generators will need additional fuel deliveries.

As the previous sections have shown there are areas within the region that are more vulnerable than others based on these social vulnerability variables. These areas of increased vulnerability will be incorporated into the risk assessment (Section 2.0) to document where hazard vulnerability and social vulnerability overlap. These areas will be among the most vulnerable populations in the region.

Transportation

Roads

The transportation network in Region 4 consists of four lane divided highways, two lane roadways and singe lane roadways. Region 4 is a mountainous and mostly rural area, so many of these transportation routes are curvy and must traverse steep road grades. The main and secondary routes are shown in the map below. There are four main routes that run through the region:

a. Interstate 64,

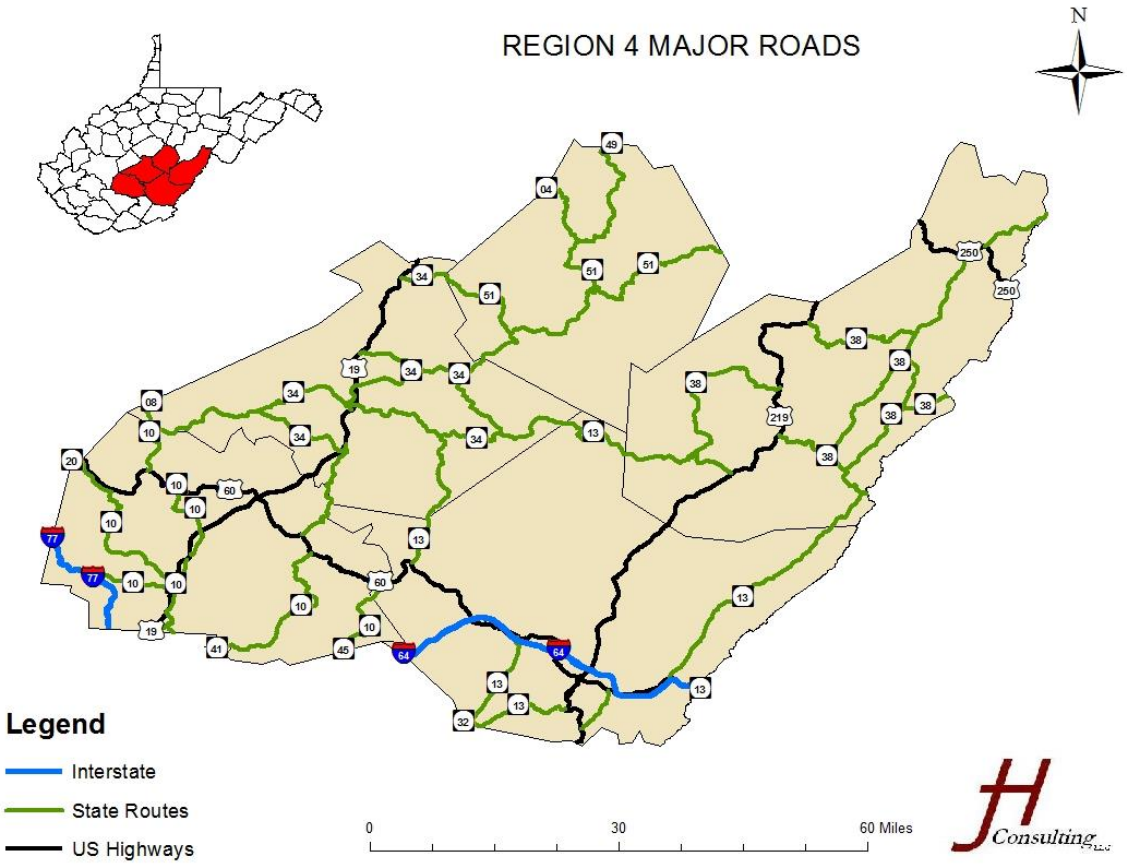
b. Interstate 77,

c. U.S. Route 19,

d. U.S. Route 60, and

e. U.S. Route 219.

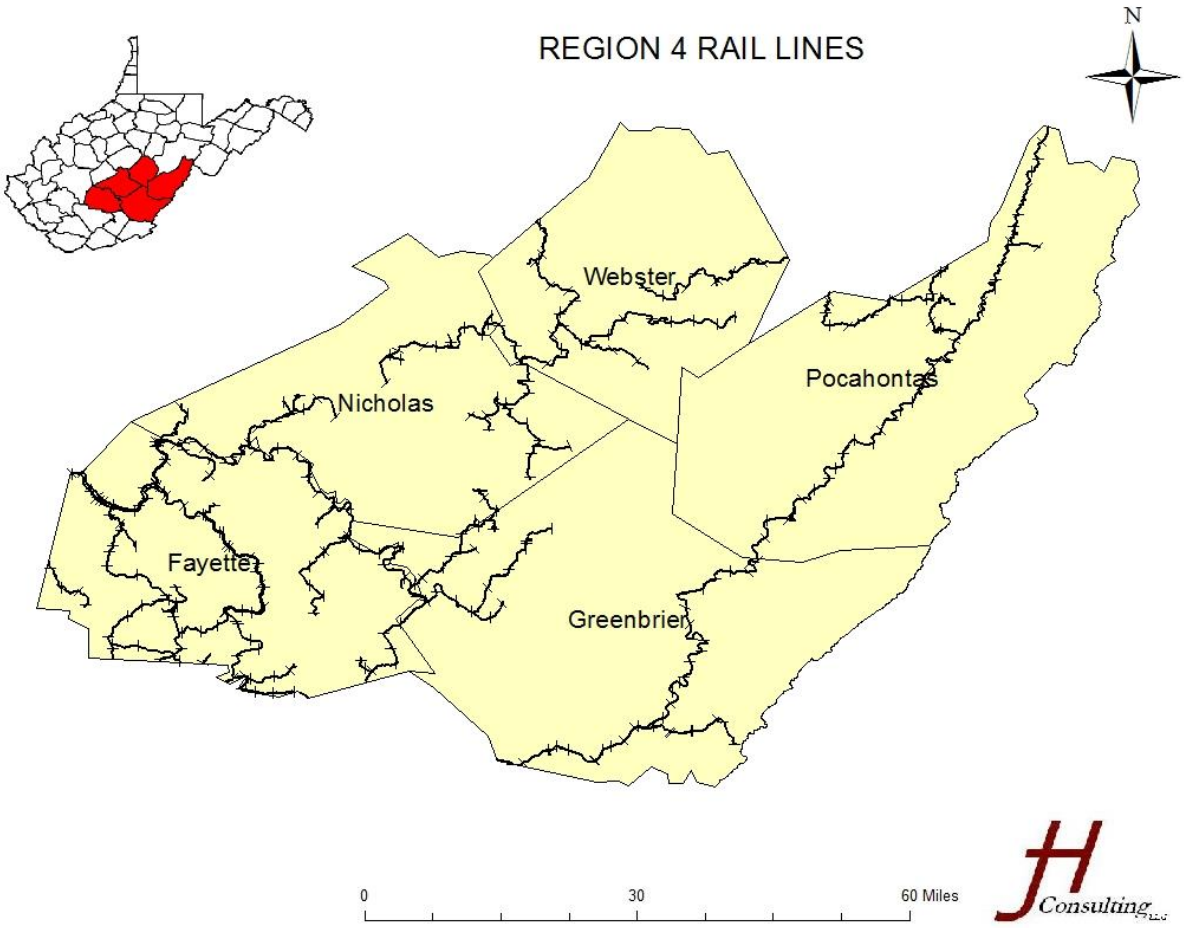
Secondary transportation routes are largely well maintained two lane highways that are more rural than primary routes. There is also a network of county roads that can range from well-maintained two lane roads to single lane roads.



Rail

All five counties in Region 4 are crossed by train tracks. Some of these routes are spurs off of main lines, while others traverse the region en route to other areas such as Charleston, which is a major industrial area. The map below shows the various rail lines that run through the region. Amtrak passenger service is also present in the region. The Cardinal Route runs from New York to

Chicago via Washington, DC, Cincinnati, and Indianapolis and makes a number of stops in West Virginia. Stops within Region 4 include White Sulphur Springs, Alderson, Thurmond, and Montgomery (Cardinal Route Info, 2016).



Air

There is one airport located within Region 4, the Greenbrier Valley Airport, located north of Lewisburg in Greenbrier County. The airport has one runway and provides daily flights to Washington-Dulles and nearly daily flights to Shenandoah Valley via its one carrier, Silver Airways (Silver Airways Timetable).

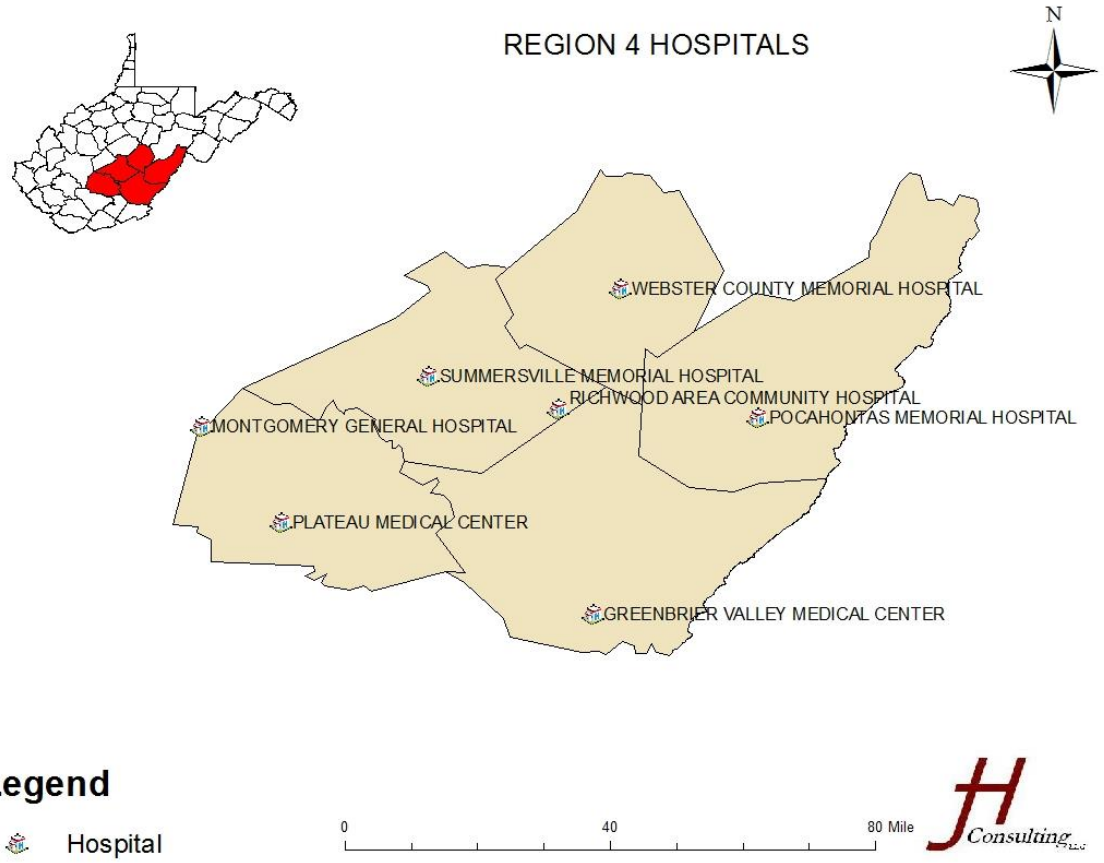
Public Transportation

There are two providers of public transit within Region 4, The Mountain Transit Authority (MTA) and the New River Transit Authority (NRTA.)The MTA serves parts of Greenbrier, Nicholas and Webster counties. The NRTA serves

parts of Raleigh and Fayette counties. Both of these providers operate on a Monday – Friday schedule, meaning that on Saturday and Sunday there is no public transportation in the region. Additionally, neither service runs outside of normal business hours. According to the WV Department of Transportation there are currently no public transportation services in Pocahontas County.

Medical Access

There are seven hospitals in Region 4, as shown below. Of these seven hospitals, four are designated as Critical Access Hospitals: Montgomery General Hospital, Plateau Medical Center, Pocahontas Medical Center, and Webster County Memorial Hospital. Critical Access Hospitals have to meet a set of standards per the U.S. Department of Health and Human Services, one of which is that be located at least 25 miles from any other hospital. These hospitals are both the front and back lines of emergency and critical care in their regions, making them highly important in the planning process. The loss of any of these facilities will leave residents without emergency medical care within a reasonable distance.



There are also a number of health centers located throughout Region 4, some of which are affiliated with the region's hospitals and some which are not. There are five rural health clinics and twenty-two community health care providers. Rural health clinics aim to serve Medicare and Medicaid recipients in an effort to increase their access in rural areas. They are required to be located in non-urban rural areas that are designated as areas of health care shortage (Health Resources & Services Administration).

Economy

The economy of Region 4 is driven by a number of industries, including government, medicine, mining and tourism. According to the Census's County Business Pattern's 2013 report, released on 4/23/2015, there are 2,648 individual businesses in Region 4. The industry with the most business in each county is the retail industry, with 465 individual businesses. The four industries that employ the most people in each county are shown in the table below.[ii]

County	Industry #1	Industry #2	Industry #3	Industry #4
Fayette	Health Care and Social Assistance (2065)	Retail Trade (1617)	Accommodation and Food Services (1053)	Mining, Quarrying, and Oil and Gas Extraction (707)
Greenbrier	Health Care and Social Assistance (2957)	Retail Trade (2032)	Manufacturing (762)	Other Services (except Public Administration) (453)
Nicholas	Health Care and Social Assistance (1725)	Retail Trade (1518)	Accommodation and Food Services (814)	Manufacturing (753)
Pocahontas	Health Care and Social Assistance (386)	Retail Trade (320)	Manufacturing (263)	Other Services (except Public Administration) (116)
Webster	Health Care and Social Assistance (446)	Retail Trade (173)	Manufacturing (108)	Accommodation and Food Services (58)

Each county has compiled a list of the top ten employers in the county.

- Fayette County
    1. Fayette County Board of Education
    2. Mt. Olive Correctional Complex

3. Kingston Mining, Inc.
4. West Virginia University
5. Wal-Mart Stores, Inc.
6. WVA Manufacturing, LLC
7. Oak Hill Hospital Corporation (Plateau Medical Center)
8. Montgomery General Hospital
9. Maple Coal Company
10. New River Health Associates

- Greenbrier County
  1. Greenbrier Hotel Corporation
  2. Greenbrier County Board of Education
  3. Greenbrier Valley Medical Center
  4. Wal-Mart Stores, Inc.
  5. West Virginia School of Osteopathic Medicine
  6. West Virginia Department of Highways
  7. Kroger
  8. Seneca Health Services, Inc.
  9. ABB, Inc.
  10. Red-Care, Inc.

- Nicholas County
  1. Nicholas County Board of Education
  2. Alex Energy, Inc.
  3. Summersville Regional Medical Center
  4. Wal-Mart Stores, Inc.
  5. Sceneca Health Services, Inc.
  6. Columbia West Virginia, Inc.
  7. Lowe's Home Centers, Inc.
  8. BE Aerospace, Inc.
  9. Nicholas County Community Action
  10. Nicholas County Nursing and Rehabilitation

- Pocahontas County
  1. Snowshoe Mountain, Inc.

2. Pocahontas County Board of Education
3. Pocahontas Memorial Hospital
4. Associated Universities (National Radio Astronomy Observatory)
5. Inter-State Hardwoods Company, Inc.
6. West Virginia Division of Natural Resources
7. West Virginia Department of Corrections, Denmar Facility
8. Stillwell Road Operation, LLC
9. Beckwith Lumber Company, Inc.
10. Pocahontas County Commission

- Webster County
  1. Webster County Board of Education
  2. Brooks Run Mining Company, LLC
  3. Webster County Memorial Hospital
  4. ASI, Inc.
  5. Seneca Health Services, Inc.
  6. Webster County Senior Citizens
  7. AMFM of Webster County, Inc.
  8. Jim C Hamer Company
  9. Allegheny Wood Products, Inc.
  10. Haney Brothers Trucking Company, Inc.

The average unemployment rate for the region, based on data from the Bureau of Labor Statistics (BLS), was 7.06 in November of 2015. Regionally, there has been a significant drop in the unemployment rates since November of 2011, when it was 9.44 for the region and over 10 for some areas.

Tourism continues to be a significant part of the economy in Region 4, with every county seeing an increase in local government revenue from tourism between 2004 and 2012 as detailed in the 2013 report *Economic Impact of Travel on West Virginia*. The regional total increase in local government revenue from tourism was nearly $3 million between 2004 and 2012. Conversely, the region saw a decrease in employment in the tourism industry. This decrease was driven by the loss of 640 jobs in Greenbrier County; every other county either saw growth or no change.

Each county has a number of tourist attractions, as seen below, and there are two attractions that stretch across county lines. These two attractions are the Monongahela National Forest, which is in parts of Greenbrier, Nicholas and Pocahontas counties, and the Gauley River, which flows through Nicholas and Fayette counties.

- Fayette County
  - New River
  - New River Gorge Bridge – Bridge Day
  - Hawks Nest State Park
  - Whitewater Rafting
  - The Mystery Hole
  - Babcock State Park
  - Thurmond Railroad Depot
  - Summit-Bechtel Reserve

- Greenbrier County
  - The Greenbrier
  - Greenbrier Classic Golf Tournament
  - Organ Cave
  - Lost World Caverns
  - Beartown State Park
  - WV State Fair

- Nicholas County
  - Summersville Lake
  - Carnifex Ferry State Park
  - Feast of the Ramson – Richwood
  - Gospel and Bluegrass Festival

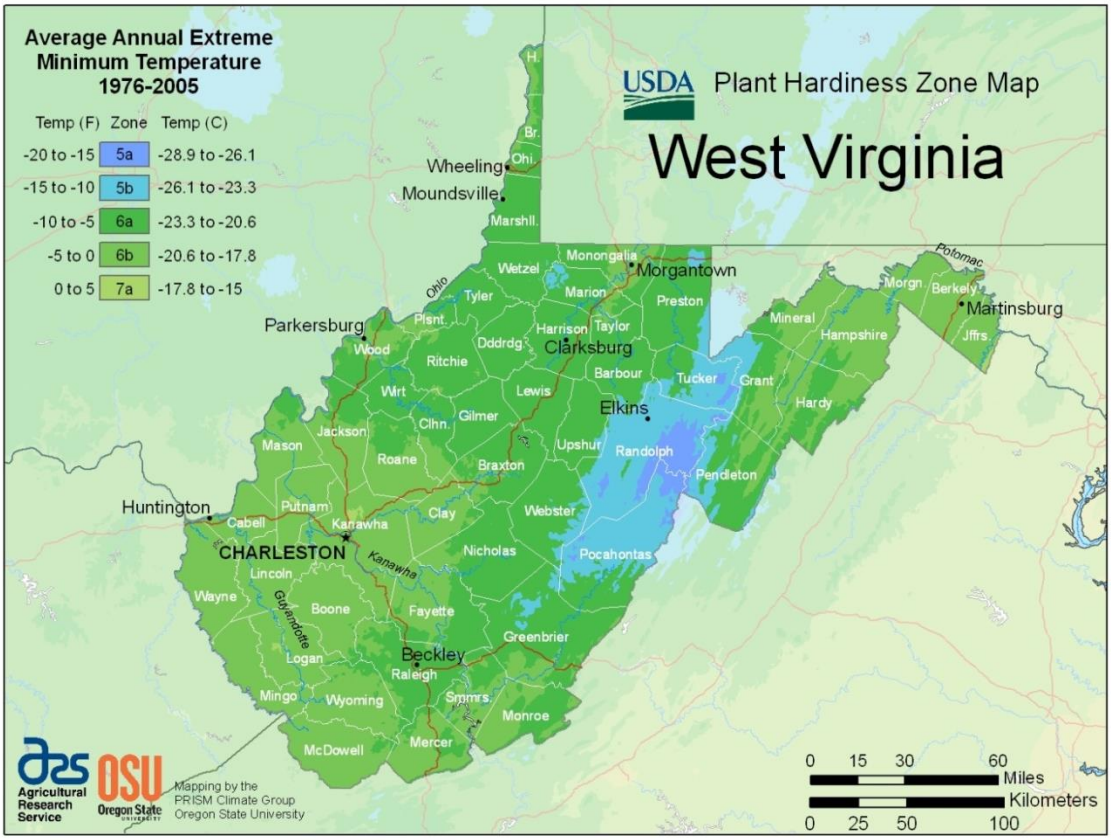
- Pocahontas County
  - Cass State Park
  - Pearl S. Buck Birthplace
  - Snowshoe Mountain
  - Watoga State Park
  - Durbin and Greenbrier Valley Railroad

- Greenbrier River Trail State Park
- Droop Mountain Battlefield
- Cranberry Glades Nature Center and Botanical Area

- Webster County
  - Holly River State Park
  - Big Ditch Lake
  - Woodchoppers Festival – Webster Springs
  - Camp Caesar

Climate

The climate of Region 4 is generally a humid continental climate with warm to hot, humid summers and cold winters, increasing in severity with elevation. The plant hardiness zones (as determined by the US Department of Agriculture [USDA]) range from zone 5b in the central Appalachian Mountains to zone 7a in the warmest parts of the lowest elevations.



Average January temperatures range from a low of 25°F in Pocahontas County to 30°F in Fayette and Nicholas Counties. The USDA Plant Hardiness Zone map, seen below, shows that temperatures are generally cooler as the elevation rises. July averages range from 70°F to 71°F.

Annual precipitation ranges from less than 32 inches (81 cm) in the lower eastern section to more than 56 inches (140 cm) in higher parts of the Allegheny Front. In the Region 4 area, an average of 45.2 inches of precipitation falls annually. Slightly more than half the rainfall occurs from April to September. West Virginia is also one of the cloudiest states in the nation. In addition to persistent cloudy skies caused by the damming of moisture by the Alleghenies, West Virginia also experiences some of the most frequent precipitation in the nation, with Snowshoe averaging nearly 200 days a year with either rain or snow. Snow usually lasts only a few days in the lower sections of the region but may persist for weeks in the higher mountain areas. Average snowfall in the Allegheny Highlands can range up to 180 inches (460 cm) per year.

Climate Change

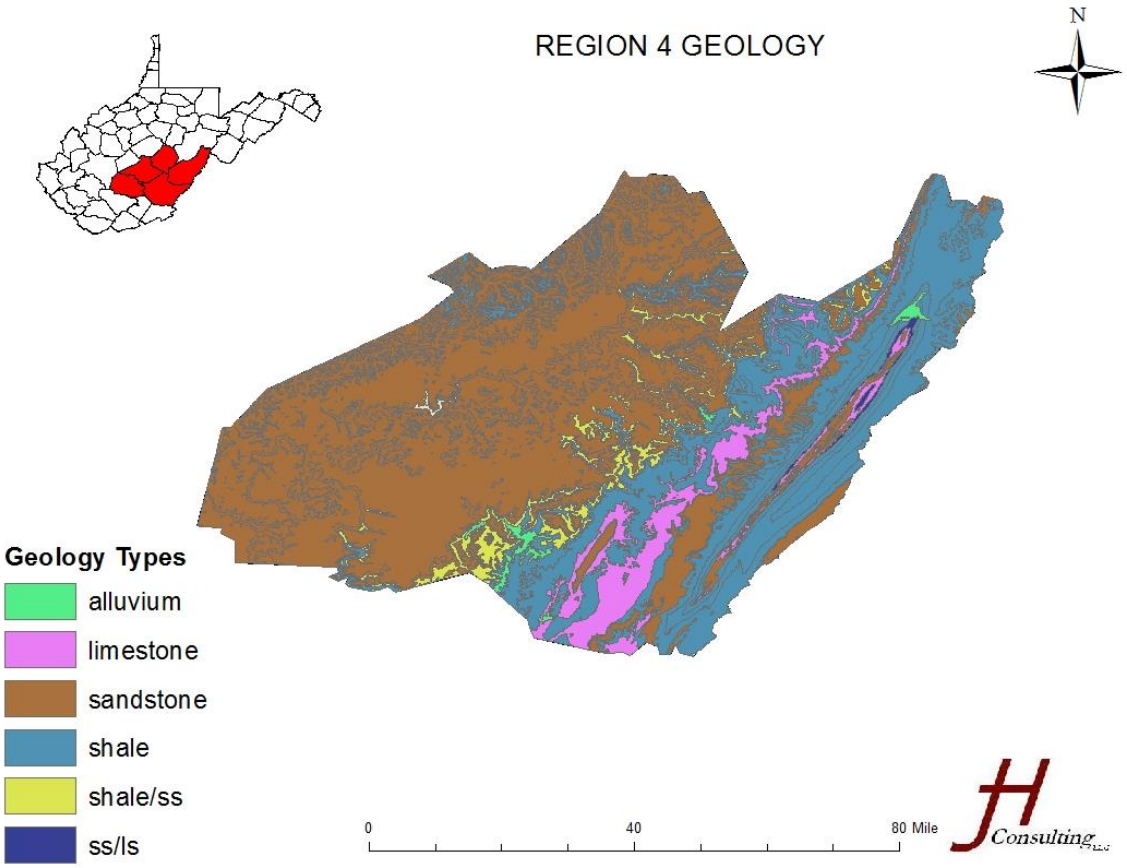
Climate change, as defined by the Environmental Protection Agency (EPA), refers to any significant change in the measures of climate lasting for an extended period of time. Generally speaking this means large changes in temperature, precipitation, or wind patterns, among others, that occur over at least several decades. The current climate changes indicate an increase in average temperature, which has risen by 1.5°F over the past century. The average temperature is projected to rise by another 0.5°F to 8.6°F over the next century according to the EPA. The United Nations considers climate change to be an emerging threat around the globe (Medina, 2016).

This ongoing warming will lead to increased risks from some hazards within Region 4. “Climate change has the potential to increase both frequency and severity of the threats and hazards that may produce a significant impact” (Trask, 2015). For example, precipitation levels are expected to rise in the northeast, increasing flood risks in low lying river valleys (Horton et al., 2014). The City of Cambridge, MA released a study in 2015 that analyzed the future impacts of climate change on the city and its planning process. Two of the challenges identified note that the past is no longer a reliable indicator of future conditions; and that current design criteria are

based on past events (Trask, 2015). Both of these challenges will have to be faces in communities across in the country in the coming years and decades. Changes in risk associated with natural hazards will be discussed in more detail the hazard profiles to follow.

Geology

The geology of Region 4 is both consistent and varied, as shown in the map below. The western three counties (Fayette, Nicholas and Webster) are composed mostly of sandstone while the eastern two counties (Pocahontas and Greenbrier) are composed of a mixture of shale and limestone.



The 2013 West Virginia Statewide Standard Mitigation Plan Update identifies areas of coal fields that are potentially minable. Two types of coal fields exist in Region 4. In all of Nicholas County and most of Fayette and Webster counties there are fields of medium and high volatile Bituminous coal. The same fields exist in the

far western regions of Pocahontas and Greenbrier counties. Fayette County also has areas of low volatile Bituminous coal that is potentially minable.

Utilities

Utilities are provided by a number of different private companies. The Public Service Commission of West Virginia tracks which companies operate in which counties. The table below shows the different utility companies by county served in Region 4. Cellular service in Region 4, including both wireless phone and data service, is provided by a number of national companies including Verizon, AT&T and U.S. Cellular among others.

County	Electric	Gas	Telephone
Fayette	Appalachian	Mountaineer Gas, Southern Public Service	Frontier
Greenbrier	Appalachian, Monongahela, and West Virginia Power	Mountaineer Gas	Frontier, and Citizens Telecommunications Company
Nicholas	Appalachian, and Monongahela	Hope Gas, Inc.	Frontier, and Citizens Telecommunications Company
Pocahontas	Monongahela, and West Virginia Power	N/A	Citizens Telecommunications Company
Webster	Monongahela Power	Hope Gas, Inc.	Citizens Telecommunications Company

Water and sewer service in Region 4 is provided by a network of private companies, municipalities, and public service districts (PSDs.) The table shown below, also based on data from the Public Service Commission of West Virginia, shows the number of each type of service for each county in the region. In total, there are 30 PSD, 5 private companies and 31 municipal water and sewer systems in Region 4. There are slightly more water suppliers (35) than sewer suppliers (31.) While some of these were listed as having the same names, they are identified separately by the Public Service Commission of West Virginia rather than being identified as “water and sewer” districts.

County	Municipal	Private	PSD
Fayette			
Sewer	7	1	7
Water	3	2	6
Greenbrier			
Sewer	3	0	2
Water	7	0	2
Nicholas			
Sewer	2	0	1
Water	2	0	6
Pocahontas			
Sewer	3	0	1
Water	2	1	1
Webster			
Sewer	1	0	3
Water	1	1	1

Residents, especially those in the more rural areas of the region, may also rely on private wells for their water source and may have septic tanks rather than being connected to a sewer system.

[i] Categories are not mutually exclusive.

[ii] In the 2013 County Business Pattern data, not all industries reported their employment number but reported a range of employment numbers instead. Those industries were not included.

2.0 RISK ASSESSMENT

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.

§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 hazard identification serves as a guide to all the jurisdictions and communities within Region 4 when assessing their vulnerabilities to hazards. The purpose of the hazard identification section is to (1) identify all the natural hazards that could affect the region, (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.

The following chart illustrates the various hazards that may occur in the planning area. Included are research sources that were used to identify and quantify these hazards. Not all of the following hazards are included in the analysis, the reasoning for not including these are listed in the chart. The chart is based on the same section of the prior iteration of the Multi-Jurisdictional Hazard Mitigation Plan.

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.
Coastal Erosion	• MapQuest	• Coastal erosion is not a significant risk as the region is not located along a coast.

Coastal Storm	• See "Thunderstorm"	• Coastal storms are not a threat to the region as it is not located along a coast.
Dam Failure	• WV Department of Environmental Protection (WVDEP) • Information from local officials • American Society of Civil Engineers (ASCE) • Association of State Dam Safety Officials (ASDSO) • Stanford University's National Performance of Dams Program	• Research shows that there are 35 dams within Region 4. • Seventeen dams are classified as a high hazard dam. • Nine are classified as a significant hazard. • Six are classified as a low hazard dam.
Debris Flow	• See "Mass Movement"	• See "Mass Movement"
Drought	• NOAA National Climactic Data Center (NCDC) Storm Events Database • USDA National Agriculture Statistics Service • Environmental Protection Agency (EPA)	• Fourteen drought events since 1997
Earthquake	• US Geological Survey (USGS) • West Virginia Geological & Economic Survey	• According to the USGS, the counties in Region range from a 2 to a 4 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. • Twenty six epicenters reported since 1974
Expansive Soils	• See "Mass Movement"	• See "Mass Movement"

Extreme Temperatures	• NCDC Event Records	• 203 extreme temperature events since 1996.
		  ○ 92 cold/wind chill
		  ○ 34 extreme cold/wind chill
		  ○ 43 heat
		  ○ 34 extreme heat

Flooding	• NOAA National Climatic Data Center (NCDC) • National Flood Insurance Program (NFIP) • FEMA Total Exposure in Floodplain (TEIF) 2.0	• 187 events in Region 4 since 1996
Hailstorm	• NOAA National Climatic Data Center (NCDC) • NOAA National Severe Storms Laboratory (NSSL) • Highway Loss Data Institute (HLDI)	• 230 events within Region 4 since 1990
Hazmat Incident	• Commodity flow studies from various Region 4 jurisdictions. • TEIR 2 data • U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) • Department of Transportation (DOT) • National Transportation Safety Board (NTSB) • The Register-Herald	• All 5 counties contain "covered facilities" that report the use and storage of hazardous materials to the appropriate Local Emergency Planning Committee (LEPC).
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.
Landslide	• See "Mass Movement"	• See "Mass Movement"

Mass Movement	• NOAA National Climatic Data Center • USGS	• Two debris flow events since 1997 • 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 occurs as a secondary result to other hazards and development.
Terrorism	• Department of Homeland Security Federal Emergency Management Agency (FEMA)	• The New River Gorge Bridge is both a component of the transportation infrastructure of Fayette County and a tourist attraction (e.g., Bridge Day). • Pocahontas Co. contains the Green Bank Observatory (comms. infrastructure, govt. operation) & Snowshoe Resort (tourist attraction).
Thunderstorm	• NCDC Event Records	• 304 Thunderstorm wind events since 1990 • 7 lightning events since 1997
Tornadoes	• NOAA National Climatic Data Center • The Tornado Project Online	• 12 tornado events in Region 4 since 1961
Tsunami	• MapQuest	• The nearest coastal area is not close enough to the region to pose a threat.
Volcano	• USGS	• No volcanoes exist on the east coast.
Wildfire	• NOAA National Climatic Data Center • West Virginia Department of Forestry. • NFIRS Data	• There have been 4 wildfire events in Region 4 since 1999.
Wind	• NCDC Event Records	• 71 wind events in Region 4 since 1997.

Winter Storm	• NCDC Event Records	• 528 winter weather events in Region 4 since 1996

While the table identifies potential and likely hazards, it is important to point out that not every area of Region 4 will have the same vulnerability to these hazards. The region contains 3,845 square miles, ranging from river valleys to the heights of mountains. For example, Fayette and Greenbrier Counties have sections of interstate highway running through them, while Nicholas County and Fayette County have long stretches of U.S. 19. These are major transportation routes, and have numerous hazardous materials passing along them on a daily basis. Since the majority of hazardous materials incidents occur during shipment, these three counties are at a higher risk for a hazardous materials incident than Webster or Pocahontas counties.

Probability vs. Severity

Part of the risk assessment is to asses both the probability of a hazard occurring, and the potential severity of the event. Doing so allows for the identification of which hazards pose the most significant risk to the jurisdictions within Region 4. This identification enables the jurisdictions to focus mitigation efforts on those hazards that are most likely to occur and cause significant harm. The probability of an event, and its potential severity, are largely based on historical research.

The numerical probability of an event can only be determined if that event has occurred in the past. For example, flooding is a perennial hazard in Region 4. The probability of a flooding event is found by summing the total number of events and dividing by the number of years that were researched. There were 187 flooding events in Region 4 over a course of 19 years (1996-2015.) The probability of a flooding event, using the formula, is 9.8. It is estimated that each year there will be 9.8 flooding events within Region 4. Hazards such as terrorism and dam failure will not have a numerical probability, because there have been no recorded instances of these hazards occurring in Region 4. Hazard probabilities are broken into five classifications, shown below.

Label	Specific Hazard Event
Frequent	Likely to occur frequently
Probable	Will occur several times in a year
Occasional	Likely to occur sometime during a year
Remote	Unlikely to occur in a year
Improbable	So unlikely that it can be assumed it will not occur in a year

The severity of an event is based on a three main factors: 1) the historical deaths, injuries, property damage and crop damage as determined through research; 2) the extent of potential secondary and/or cascading impacts of the hazard and; 3) the potentially impacted geographic area as determined by research and mapping. Primary impacts occur as a direct result of the event, while secondary/cascading impacts can only arise after the primary impact. For example, a primary impact of a flood may be a road closure due to submerged roadways. The secondary impact would be the cost of detouring around the area, both in terms of time and fuel.

Severity calculations are generally less exact than probability calculations. While the historical records give researchers the ability to estimate losses, these estimates are ball park figures. For example, one event alone in Fayette County caused $47 Million in damages while the calculated average property loss for both flooding and flash flooding combined is estimated to cause $1,350,185 per year. The four classifications of hazard severity and their definitions are shown below.

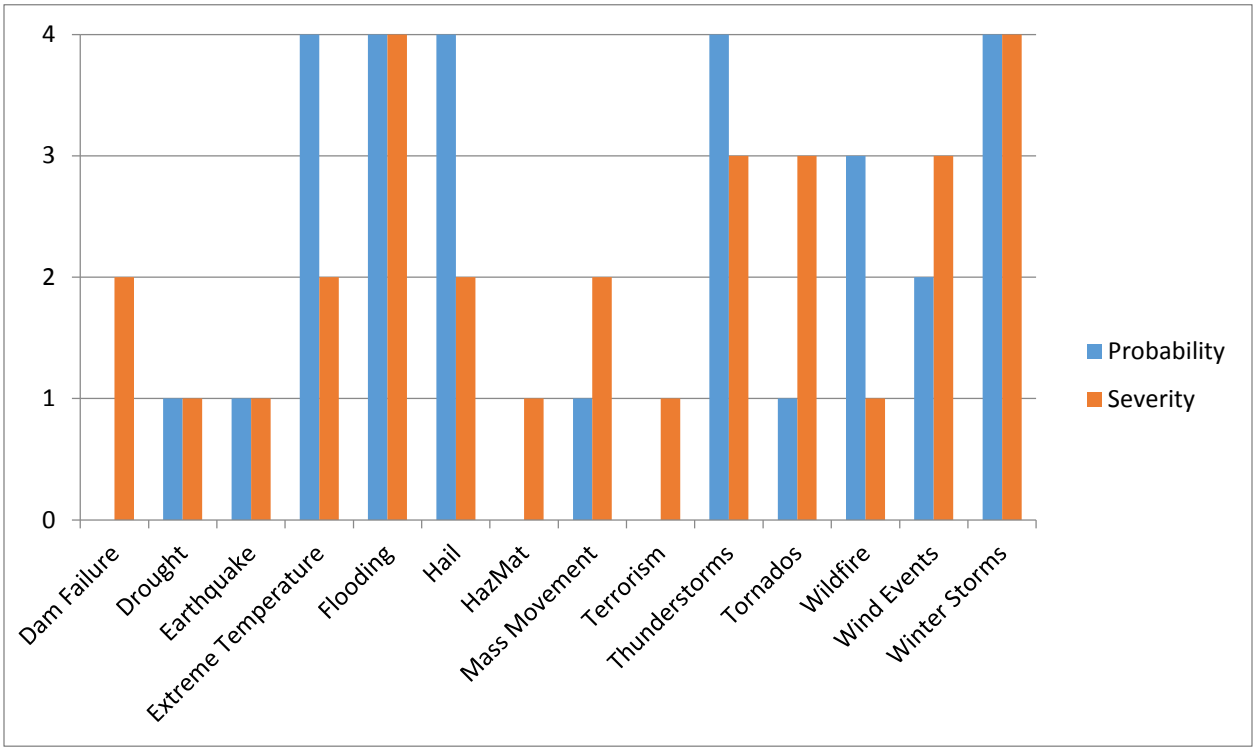
Description	Definition
Catastrophic	Death or major structural loss
Critical	Severe injury, severe illness, or marginal structural damage
Marginal	Minor injury, minor illness, or structural damage
Negligible	Less than minor injury, illness or structural damage

The risk assessment matrix, shown below, combines the probability and severity calculations that were discussed above to present a clear picture of which hazards are of most concern to the jurisdictions within Region 4.

Hazard Severity	Hazard Probability				
	Frequent (4)	Probable (3)	Occasional (2)	Remote (1)	Improbable (0)

Catastrophic (4)	Flooding, Winter Storms				
Critical (3)	Thunderstorms		Wind Event	Tornado	
Marginal (2)	Hail			Mass Movement	Dam Failure
Negligible (1)		Wildfire		Drought, Earthquake	HazMat, Terrorism

Another presentation of the data is below. The probability and severity of each hazard was given a numerical representation (0-4 for probability, 1-4 for severity.) These were used to generate the chart show below.



Disaster Declarations

The committee considered past disaster declarations in the determination of hazards to include in this plan. Procedurally, committee members felt that historical instances resulting in significant damage or a presidential declaration indicated the potential for future occurrences in the region. The following table lists the disaster declarations impacting the Region 4 area.

FEMA Disaster and Emergency Declarations from 2011 to 2016 in Region 4 PDC Area

Disaster Declaration #	County Impacted	Date	Event
4273	Kanawha, Greenbrier, Nicholas, Fayette, Wayne, Lincoln, Summers, Monroe, Pocahontas, Clay, Webster, Braxton, Roane, Jackson, Gilmer, Lewis, Upshur, Randolph	June 25, 2016	Severe Storms, Flooding, Landslides and Mudslides
4236	Logan, Lincoln, Wood, Jackson, Roane, Clay, Braxton, Nicholas, Webster	August 7, 2015	Severe Storms, Straight-line Winds, Flooding, Landslides and Mudslides
4221	Pleasants, Wirt, Calhoun, Roane, Jackson, Cabell, Greenbrier, Summers	May 21, 2015	Severe Storms, Flooding, Landslides, and Mudslides
4210	Marshall, Wetzel, Monongalia, Tucker, Barbour, Harrison, Tyler, Doddridge, Lewis, Upshur, Webster, Braxton, Gilmer, Ritchie, Wood, Wirt, Roane, Jackson, Putnam, Kanawha, Fayette, Summers, Mercer, McDowell, Mingo, Wayne, Cabell, Lincoln, Logan, Wyoming, Raleigh, Boone	March 31, 2015	Severe Winter Storm, Flooding, Landslides, and Mudslides
4093	Preston, Taylor, Tucker, Barbour, Randolph, Pendleton, Upshur, Lewis, Braxton, Webster, Pocahontas, Nicholas, Clay, Kanawha, Fayette, Boone, Raleigh, Wyoming	November 27, 2012	Hurricane Sandy
4071	All counties except Hancock, Brooke, Ohio, Monongalia, Marion, Mineral, Hampshire, Morgan	July 23, 2012	Severe Storms & Straight-Line Winds
3358	Statewide	October 29, 2012	Hurricane Sandy
3345	Statewide	June 30, 2012	Severe Storms

2.2 PROFILE HAZARDS

§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.

Section Overview

Several hazards affect Region 4, as noted in the Section 2.1 above. Those hazards; however, may not affect the county in ways that residents and planners may typically think. Additionally, while a hazard may occur frequently, it may cause little damage or disruption; conversely, a hazard that rarely occurs may cause significant damage and disruption. As such, this section contains a profile of each hazard considered by this plan, which provides details on how the hazard impacts the area. Additionally, this section discusses a number of complicating variables that could either result in emergencies on their own or add to the complexity of the profiled hazards.

DAM FAILURE

"Dam failures pose the most extreme flood risk due to the sudden and severe impacts that can result" (Haddow, Bullock, & Coppola, 2014, pg.54.)

Research Sources:

- WV Department of Environmental Protection (WVDEP)
- Interviews with Local Officials
- American Society of Civil Engineers (ASCE)
- Association of State Dam Safety Officials (ASDSO)
- Stanford University's National Performance of Dams Program

Period of Occurrence	At any time
Number of Events (1950-2015)	0
Probability of Event	Infrequent: Dams that fail typically have some deficiency which should be detected by regular inspections and appropriate repair. Heavy rains or moderate earthquakes may also trigger a dam failure.
Warning time	Minimal: Depends on frequency of inspection and repair.
Potential Impacts	Potential for loss of life, economic loss, environmental damage and distribution of life
Cause Injury or Death	Risk of multiple injuries and deaths.
Potential Facility Shutdown	30 days or more

Hazard Effects

The West Virginia Department of Environmental Protection defines a dam as "an artificial barrier or obstruction that impounds, or will impound water[i]" (WVDEP, 2009). In West Virginia, for a dam to be regulated by the state, it must be equal to or greater than 25 feet in height and contain 15 or more acre feet of water volume[ii] or be greater or equal to 6 feet in height and contain 50 or more acre-feet of water volume[iii] (WVDEP, 2009). There are exemptions from these regulations, including dams own by the Federal government, dams that do not normally impound water (such as road fills with culverts) and dams build primarily for agricultural use that have been shown to not cause loss of life in the dam should fail.

Dams are classified into three categories by the American Society of Civil Engineers (ASCE) based on their hazard potential. Dams are classified as high hazard, significant hazard or low hazard.

- **High Hazard:** Failure or mis-operation is expected to result in loss of life and may also cause significant economic losses.

- **Significant Hazard:** Failure could result in significant economic losses but not necessarily cause a loss of life.
- **Low Hazard:** Located in a rural or agricultural area would failing would only cause the loss of the dam itself and minor damage to nonresidential buildings and rural/agricultural land (2013).

The WVDEP includes a fourth category of dams, that of "negligible hazard." This category is defined as dams where failure is expected to have no potential for human life loss, property damage or potential for significant harm to the environment.

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 and unpredictable flooding of areas immediately downstream. According to the Association of State Dam Safety Officials (ASDSO) most dam failures fall into one of three categories: structural failures, mechanical failures and hydraulic failures.

- **Structural Failures:** Foundation defects, including settlement and slope instability or damaged cause by earthquakes, have caused about 30% of all U.S. dam failures.
- **Mechanical Failures:** Malfunctioning gates, conduits or valves can cause dam failure or flooding both upstream and downstream.
- **Hydraulic Failures:** Overtopping of a dam is often a precursor of dam failure. National statistics show that overtopping due to inadequate spillway design, debris blockage of spillways or settlement of the dam crest account for approximately 34% of all U.S. dam failures (ASDSO, 2012).

Because dam failures have the potential to result in loss of life and severe economic loss, the ASCE recommends that all high hazard dams have any emergency action plan in the event of an impending failure (ASCE, 2013). An emergency action plan, or EAP, is "an essential plan used in the event of a dam failure to identify and notify people residing below the dam, and to coordinate their evacuation" (ASCE, 2013).

Hazard Profile

There are thirty-five dams within the Region 4 area. Of these, seventeen are classified as a high hazard dam, nine are classified as a significant hazard dam, and six are classified as a low hazard dam. For three of the dams there was no hazard class listed. Of the thirty-two dams in the region that have a hazard classification, only seven are listed as

having an emergency action plan. This includes eleven of the high hazard dams and eight of the significant hazard dams. The table below lists the dams found in Region 4. The city listed in the table is the community that is closest to the dam, downstream.

Dam Name	Hazard	County	City	EAP
Babcock Lake Dam	H	Fayette	Glen Ferris	Y
Big Ditch Lake No. 1	S	Webster	Welch Glade	N
Burns Lower Farm Lake	S	Pocahontas	Frank	Y
Camp Caesar Dam	H	Webster	Gauley Mills	N
Cedar Branch Dam	H	Fayette	Thurmond	N
Coal Run No. 2 Dam	Unk	Fayette	Brooklyn	N
Corliss Dam	L	Fayette	Corliss	N
Cowen B&O Dam	Unk	Webster	Cowen	Unk
Dawson Dam	H	Greenbrier	Rupert	Unk
Gauley Eagle No.4	H	Nicholas	Calvin	N
Glen Ferris	L	Fayette	Kanawha Falls	N
Handley Public H & F Lake No.	S	Pocahontas	Dyer	N
Hawks Nest	H	Fayette	Gauley Bridge	Y
Howard Creek 12	H	Greenbrier	Tuckahoe	Y
Lake Buffalo	L	Pocahontas	Bartow	N
Lake Sam Hill	S	Pocahontas	Dilly's Mill	N
Marlin Run No. 1	H	Pocahontas	Marlinton	N
No.1 Prep	H	Nicholas	Gilboa	N
No.1 Prep	H	Nicholas	Gilboa	N
No.1 Prep	L	Nicholas	Gilboa	N
Plum Orchard Lake Dam	H	Fayette	Mossy	Y
Seneca Lake	S	Pocahontas	Dilly's Mill	N
Shavers Fork Dam	S	Pocahontas	Cheat Bridge	Unk
Sherwood Lake	L	Greenbrier	Neola	N
Silver Creek Dam	S	Pocahontas	Cheat Bridge	Unk
Snowshoe	S	Pocahontas	Spruce	N
Summersville Dam	H	Nicholas	Swiss	Y
Summit Lake	H	Greenbrier	Richwood	Y
The Summit - Dam 1.2	H	Fayette	Harvey	Unk
The Summit - Dam A	H	Fayette	Harvey	Unk
The Summit - Dam A1	H	Fayette	Thurmond	Unk
The Summit - Dam B	H	Fayette	Harvey	Unk
U. T. Barren Branch Dam	Unk	Fayette	Thurmond	N
Un Trib Plum Orchard	L	Fayette	Mossy	N
Watoga Lake Dam	S	Pocahontas	Seebert	N

Many of the dams in the region are owned and operated by the government, either state Division of Natural Resources and the West Virginia Conservation Agency or a local government, such as the Town of Cowen, which owns and operates the Cowen B&O dam in Webster County. Dams associated with the division of natural resources are inspected by that division. Dams associated with state parks can be large, such as the Watoga facility, but are generally located in rural areas where a failure would not result in significant loss of life or have a significant economic effect. In addition to those facilities owned by state and municipal government there are a number of dams that are associated with mining activity prevalent in the region. For example, the Peerless Eagle Coal Company owns three dams in Nicholas County. According to Bloomberg Business, Peerless Eagle filed for bankruptcy protection in August of 2015. As the mining industry declines in the region, as discussed elsewhere, the risk exists that these facilities will deteriorate without needed maintenance and inspections.

The risks associated with a dam failure are not isolated to the region, however. A dam failure can easily cascade into other waterways, possibly overflowing these waterways. A cascade effect can quickly spread; causing facilitates to fail in numerous locations. This is especially true in an event caused by heavy rains or snow melt (or any combination thereof) where local rivers and dam facilities will already be near max capacity. Failures within the region can cause cascading effects in other areas such as Kanawha County. Failures outside the region, such as the Bluestone Dam in Hinton, West Virginia could cause cascading effects into the region.

While the hazards of dam failure exist through much of the region, there are primary risk areas associated with certain facilities and waterways. These areas are along the New, Gauley and Kanawha Rivers, which include a number of communities and unincorporated areas.

Historical Occurrences

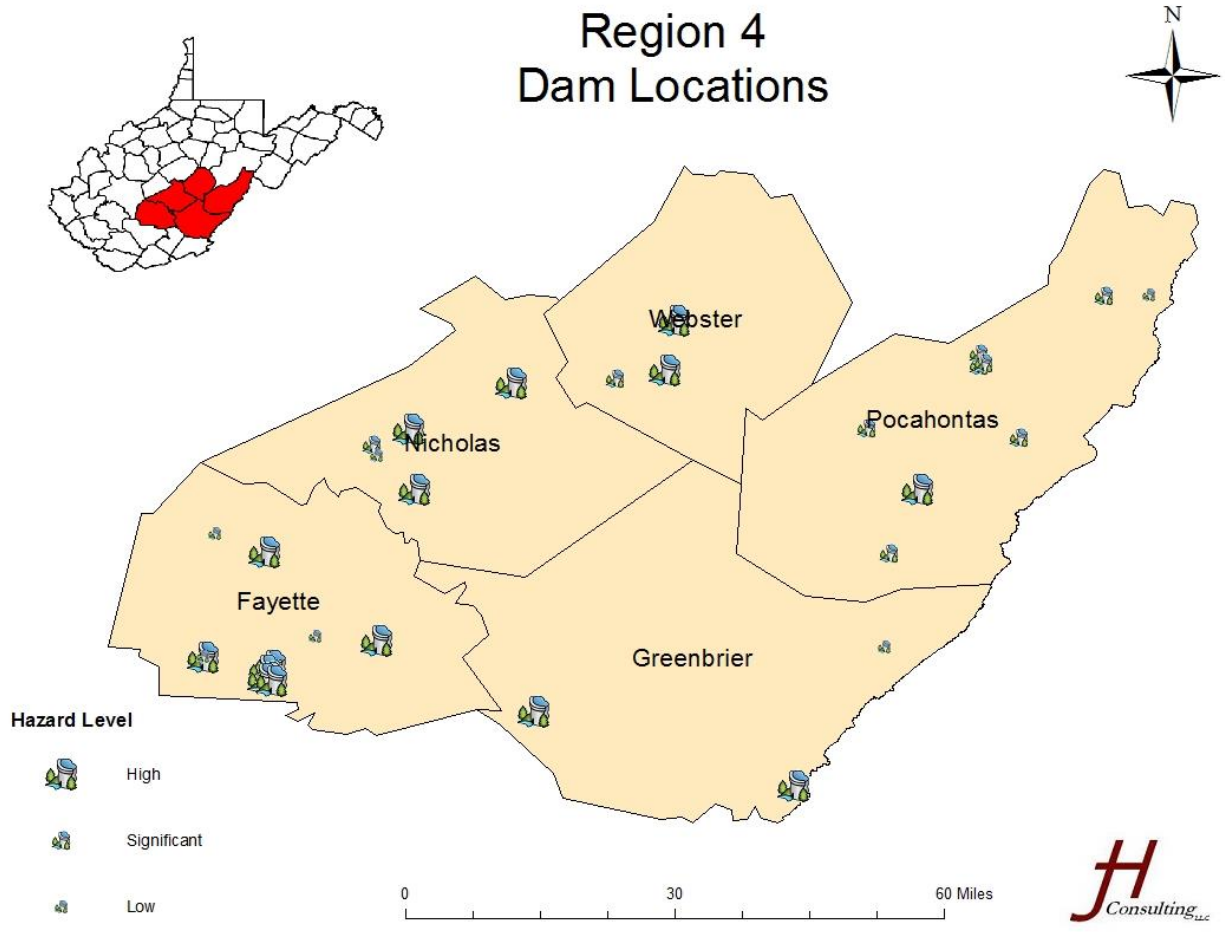
The Stanford University National Performance of Dams Program (NCDC) lists ten dam incidents in West Virginia going as far back as 1914. The research shows that none of these events have occurred within Region 4.

Loss Estimates

With no historical data, estimating a loss estimate for a dam failure is difficult. These events can range from the failure of a small local dam that does not threaten anything more

than fields or forests, to dams that can cause significant loss of life and property damage. For the purposes of this estimation, the total exposure in the flood plain calculated by the TEIF 2.0 methodology in the flooding profile below was divided by the number of high and significant hazard dams located within the region. The result is an estimated $35,303,542.71 in property damage per one dam failure.

Dam Locations Map



DROUGHT

"A prolonged shortage of available water, primarily due to insufficient rain and other precipitation or because exceptionally high temperatures and low humidity cause a drying of agriculture and a loss of stored water resources" (Haddow, Bullock, & Coppola, 2014, pg.51.)

Research Sources:

- NOAA National Climactic Data Center (NCDC) Storm Events Database
- USDA National Agriculture Statistics Service
- Environmental Protection Agency (EPA)

Period of Occurrence	Warm weather months or periods of low to no precipitation
Number of Events (1997-2015)	14
Probability of Event	0.78
Warning time	Weeks
Potential Impacts	Industries that rely heavily on water usage will be disproportionately affected. These industries primarily include tourism and agriculture. The impact will spread as droughts extend and increase in severity.
Cause Injury or Death	None
Potential Facility Shutdown	None
Climate Change Impact	Significant

Hazard Effects

A drought, according to the National Climactic Data Center (NCDC), is a complex event that is difficult to monitor or define. There are four types of droughts, increasing in severity level; meteorological drought, hydrological drought, agricultural drought, and socioeconomic drought.

- **Meteorological Drought:** dry weather patterns dominating an area.
- **Hydrological Drought:** Usually after several months of meteorological drought, when low water supplies become noticeable. I.E. low water levels in streams and reservoirs.
- **Agricultural Drought:** When crops become affected by the drought conditions.

- **Socioeconomic Drought:** Relates the supply and demand of various commodities to drought

The most prevalent method of measuring drought severity in the United States is the Palmer Drought Severity Index (PDSI) developed in 1965. The index takes a number of factors into account to assign a score between -4 (extremely dry) and +4 (extremely wet), with 0 being the "normal" value (Palmer, 1965.) Palmer drought values typically reflect long term drought, but can be calculated both monthly and weekly.

Droughts can also impact drinking water both in terms of availability and demand. According to the EPA as temperatures rise, people and animals need more water to maintain health. Additionally a large number of economic activities require abundant water sources such as energy production (hydroelectric and nuclear power generation for example) and growing food crops. As available water sources are reduced by droughts water usage will need to be closely monitored to maintain enough for critical uses. This has been seen on numerous occasions in drought prone areas such as southern California.

Hazard Profile

Droughts, once they reach the level of agricultural drought, can cause significant damage to economies that are heavily agrarian. In Greenbrier County in the fall of 1998 two drought events recorded by the NCDC caused $115,000 in crop damage. Data from the National Agricultural Statistics Survey (NASS), a division of the USDA, shows that a drought in 2002 led to dramatically lower hay crop yields in Fayette and Nicholas counties. Fayette County saw a drop of 3,200 tons from 2001 to 2002, while Nicholas County saw a drop of 7,300 tons. Each was approximately a 30% decrease in output.

Location	Total	Crop Damage
Fayette	5	$ -
Greenbrier	2	$ 115,000.00
Nicholas	0	$ -
Pocahontas	1	$ -
Webster	6	$ -
Total	14	$ 115,000.00

The table below shows that, in Region 4, all five counties have seen increases in market value of products from agricultural activity since 2007. Across the region, agriculture

saw an increase in market value of products of over $36 Million. Conversely, each county has seen a reduction in the number of farms. Greenbrier County is the only county in the region to see an increase in farmland acreage over the five years.

	2007	2012	Change
Fayette County			
Number of Farms	265	232	-33
Land in Farms (acres)	26,677	23,163	-3,514
Market Value of Product Sold	$ 1,724,000.00	$ 1,735,000.00	+ $ 11,000.00
Greenbrier County			
Number of Farms	881	819	-62
Land in Farms (acres)	176,995	190,178	+13,183
Market Value of Product Sold	$ 42,976,000.00	$ 76,758,000.00	+ $ 33,782,000.00
Nicholas County			
Number of Farms	434	393	-41
Land in Farms (acres)	51,332	58,093	+6,761
Market Value of Product Sold	$ 2,713,000.00	$ 4,578,000.00	+ $ 1,865,000.00
Pocahontas County			
Number of Farms	390	389	-1
Land in Farms (acres)	121,878	118,464	-3,414
Market Value of Product Sold	$ 8,165,000.00	$ 9,250,000.00	+ $ 1,085,000.00
Webster County			
Number of Farms	123	70	-53
Land in Farms (acres)	11,530	7,928	-3,602
Market Value of Product Sold	$ 242,000.00	$ 332,000.00	+ $ 90,000.00
Totals			
Number of Farms	2,093	1,903	-190
Land in Farms (acres)	388,412	397,826	+9,414
Market Value of Product Sold	$ 55,820,000.00	$ 92,653,000.00	+ $ 36,833,000.00

County	2007 (Per Acre)	2012 (Per Acre)	Change
Fayette	$ 64.62	$ 74.90	$ 10.28
Greenbrier	$ 242.81	$ 403.61	$ 160.80
Nicholas	$ 52.85	$ 78.80	$ 25.95
Pocahontas	$ 66.99	$ 78.08	$ 11.09
Webster	$ 20.99	$ 41.88	$ 20.89
Total	$ 448.27	$ 677.28	$ 229.01

As shown above, the value of each acre has increased significantly since 2007. Each acre of farm land in Region 4 in 2012 produces $229.01 more in terms of the market value of product sold than it did in 2007. Both the decrease in the amount of farm land and the increased value of each acre makes the region more economically vulnerable to droughts that reach the agricultural level.

Determining specific risk and vulnerability areas for drought is difficult, as it is with many hazards. Precipitation levels can easily vary in different areas of the region, while seepage into the groundwater supply distributes water to drier areas. Thus drought is said to affect the entire region evenly.

Loss Estimates

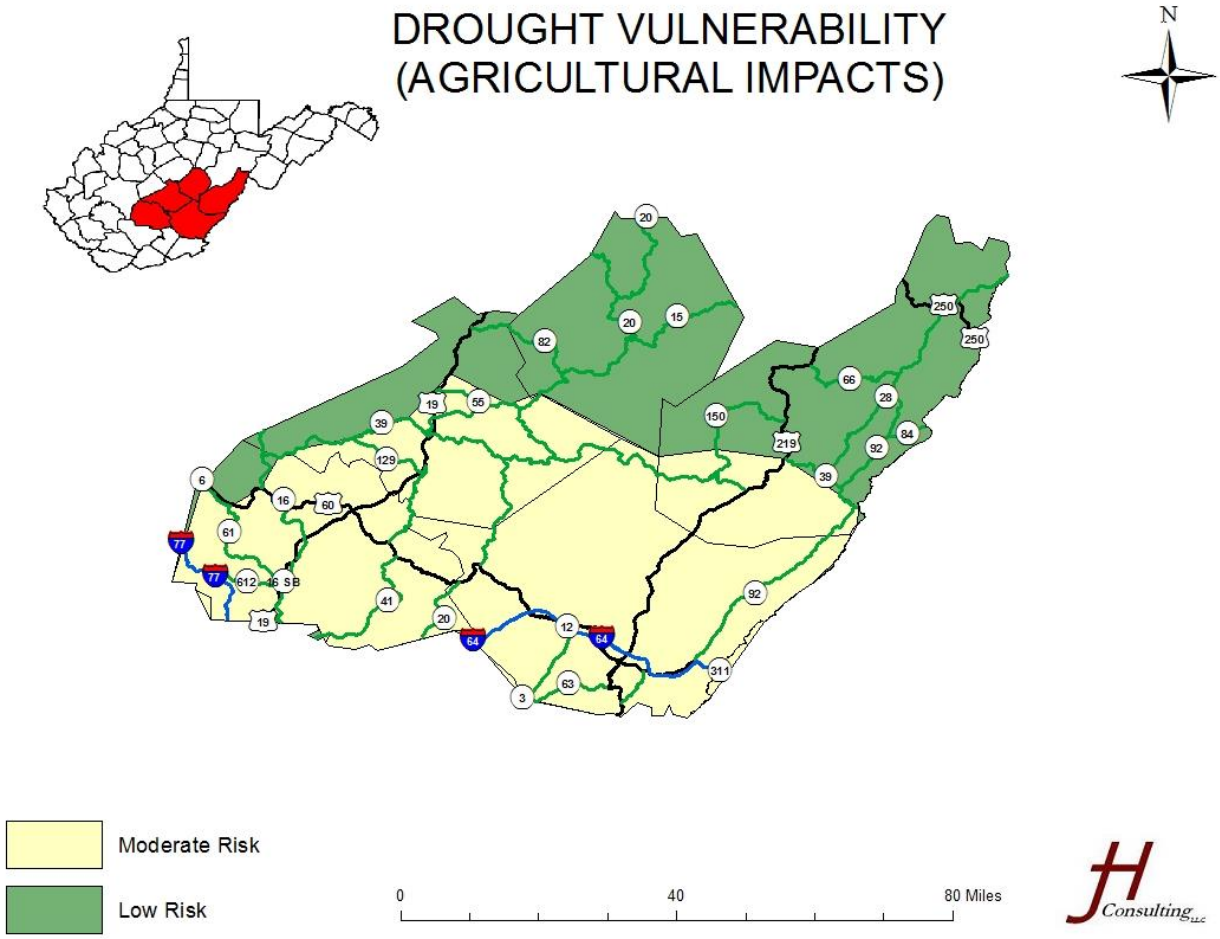
Loss estimates for droughts are difficult to quantify, though we can say that droughts affect crops, rather than structures. There is no need for a loss estimate for structural damage. The varying severity levels of droughts makes estimating crop loss difficult, especially considering the numerous possible mitigating factors such as time of year, heartiness of crop, etc.

For the purposes of this loss estimate, the hay yields in two non-drought years (2001 & 2003) and a drought year (2002) were compared, with the results shown in the table below. This particular drought event occurred in Fayette County. The table shows that in a year of a NCDC listed drought, the hay yield in Fayette County was down by 3,200 tons, a 32% reduction from the prior non-drought year. Data is from the National Agricultural Statistics Survey (NASS), a division of the USDA.

County	Hay Yield 2001	Hay Yield 2002	Hay Yield 2003
Fayette	9,900	6,700	8,600

The worst case scenario for this hazard would involve the entire agricultural sector being affected by a prolonged and serious drought. Based on 2012 numbers, the losses would total upwards of $92,653,000.00, the value of the agricultural output for the region.

Risk Map



EARTHQUAKES

"Sudden, rapid shaking of the earth's crust cause by the breaking and shifting of tectonic plates beneath the earth's surface" (Haddow, Bullock, & Coppola, 2014, pg.34.)

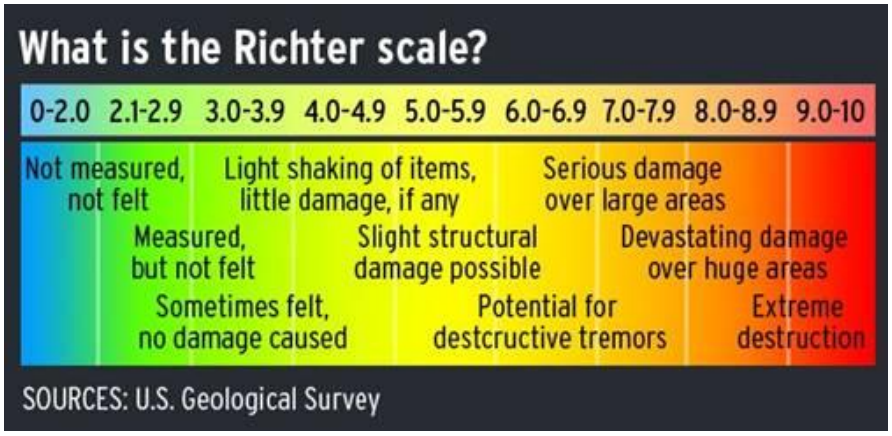
Research Sources:

- US Geological Survey (USGS)
- West Virginia Geological & Economic Survey

Period of Occurrence	At any time
Number of Events (1974-2015)	26 Epicenters
Probability of Event	0.63
Warning time	None to Limited
Potential Impacts	Little damage
Cause Injury or Death	Minor risk of injury
Potential Facility Shutdown	Hours to days

Hazard Effects

An earthquake's sudden release of stored energy may manifest itself by the shaking or displacement of the ground. The magnitude of an earthquake is a measurement of its severity and is measured using the Richter scale, developed in 1935. The magnitude of an earthquake can range between less than 2.0 to 9.0 and greater. The image below shows the Richter scale and what effects each magnitude can have. The effects of an earthquake can be felt far beyond the site of its occurrence.



According to the U.S. Geological Society, based on historical trends, the frequency of an earthquake occurrence is inversely related to its magnitude. There are an estimated 1.3 million earthquakes every year with a magnitude between 2.0 and 2.9 while there is, on average, 1 magnitude 8.0 or higher earthquake annually.

The Modified Mercalli Scale (MMS) measures earthquakes based on their intensity on the surface. This scale, shown at right, uses roman numerals I through XII to denote detection and damage levels associated with an earthquake. An earthquake can immediately be measured on the Richter Scale while an MMS measurement takes time to determine.

Modified Mercalli Scale		Richter Magnitude Scale
I	Detected only by sensitive instruments	1.5
II	Felt by few persons at rest, especially on upper floors; delicately suspended objects may swing	2
III	Felt noticeably indoors, but not always recognized as earthquake; standing autos rock slightly, vibration like passing truck	2.5
IV	Felt indoors by many, outdoors by few, at night some may awaken; dishes, windows, doors disturbed; autos rock noticeably	3
V	Felt by most people; some breakage of dishes, windows, and plaster; disturbance of tall objects	3.5
VI	Felt by all, many frightened and run outdoors; falling plaster and chimneys, damage small	4
VII	Everybody runs outdoors; damage to buildings varies depending on quality of construction; noticed by drivers of autos	4.5
VIII	Panel walls thrown out of frames; fall of walls, monuments, chimneys; sand and mud ejected; drivers of autos disturbed	5
IX	Buildings shifted off foundations, cracked, thrown out of plumb; ground cracked; underground pipes broken	5.5
X	Most masonry and frame structures destroyed; ground cracked, rails bent, landslides	6
XI	Few structures remain standing; bridges destroyed, fissures in ground, pipes broken, landslides, rails bent	6.5
XII	Damage total; waves seen on ground surface, lines of sight and level distorted, objects thrown up in air	7
		7.5
		8

Hazard Profile

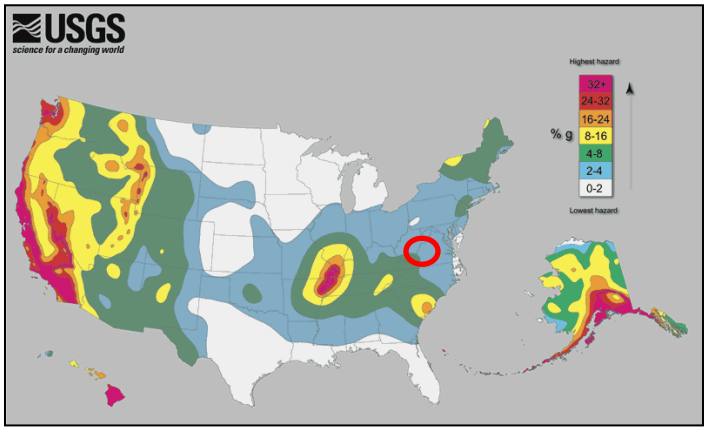
The West Virginia Geological & Economic Survey tracks earthquakes within West Virginia, recording their locations and magnitudes among other variables. Historically, the counties that make up Region 4 have had twenty-six epicenters located within their borders. The breakdowns by county are seen below. The average magnitude of these events is 1.8, meaning they are mostly below the threshold of being felt. The largest magnitude event on record was an epicenter with a 3.5 magnitude that occurred in Greenbrier County in the early morning hours of April 4th, 1991. While earthquakes with epicenters within Region 4 are rare, the effects of earthquakes outside the region can be still be felt. A recent example is an earthquake in 2011 that was centered in Louisa County, VA (38 miles northwest of Richmond, VA.) This quake registered a magnitude of 5.8 and a VII (very strong) on the Mercalli intensity scale. The effects of this event, and the damage it caused, were felt up and down the east coast including across West Virginia.

County	Total
Fayette	5
Greenbrier	10
Nicholas	2
Pocahontas	8
Webster	1
Total	26

The U.S. Geological Survey map seen below shows that parts of Region 4 are considered more at risk for earthquake activity than others. However, all areas of the region are within the bottom three hazard rankings.

The number of earthquakes has been on the rise in the eastern United States according to the USGS. Between 1973 and 2008, there was an average of 21 earthquakes of magnitude 3 or higher per year. Between 2009 and 2013, that average had gone up to 99.

The somewhat random historical occurrences of earthquakes would indicate that all structures throughout Region 4 are at risk from earthquakes, with structures in Greenbrier and Pocahontas County being slightly more vulnerable. Though the probability of an earthquake epicenter occurring in any given year within Region 4 is 0.70, historically these are measured but not felt. The historical probability of an earthquake that is of high enough magnitude to be felt (generally 3.0 and higher) is 0.05. Historically, there have not been any epicenters in Region 4 of high enough magnitude to cause structural damage.



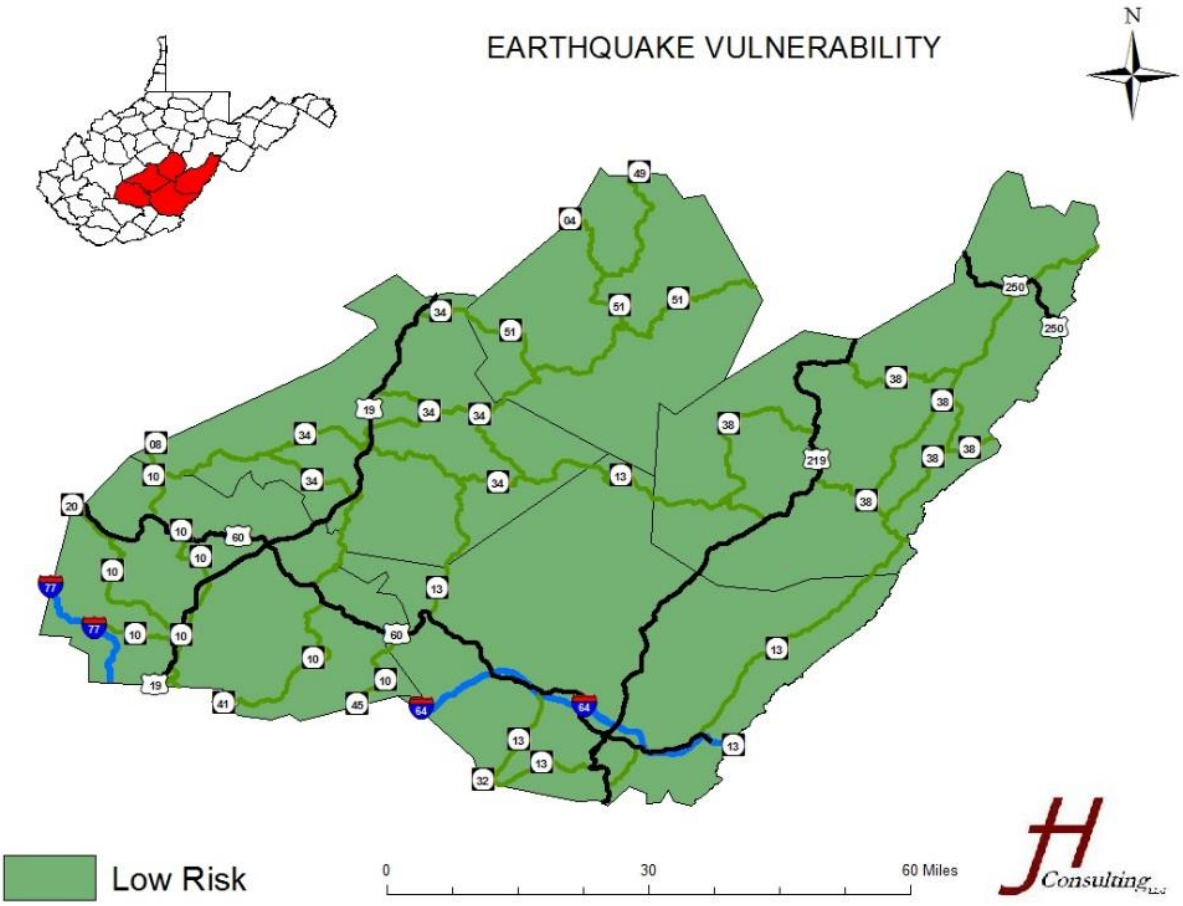
Loss Estimates

Earthquake loss estimates for Region 4 were obtained using the HAZUS-MH software. A scenario was developed using the location of the largest magnitude epicenter to occur in Region 4, a 3.5 magnitude earthquake in northeastern Greenbrier County, just west of State Route 92. The magnitude chosen for the scenario was the lowest possible in HAZUS: 5.0.

Using the output data from HAZUS and a loss estimation workbook developed by the Ohio Emergency Management Agency, it is possible to find the number of buildings that will be affected by this event, as well as the monetary exposure the region has. The results are shown in the table below. It is important to note that there has never been an earthquake event of this magnitude anywhere within Region 4, so this would be considered a worst case scenario.

Building Type	Number of Buildings	Exposure in Study Region
Residential	1,088	$174,223,464
Non-Residential	1,062	$65,538,598
Critical Facilities	14	$863,974
Totals:	2,164	$240,626,036

Risk Map



EXTREME TEMPERATURES

"Major diversions in average seasonal temperatures can cause injuries, fatalities, and major economic impacts when they are prolonged or coincide with other natural or technological events" (Haddow, Bullock, & Coppola, 2014, pg.51.)

Research Sources:

- NOAA National Climatic Data Center

Period of Occurrence	Any season, but generally summer and winter
Number of Events (1996-2015)	203
Probability of Event	10.68
Warning time	Weeks
Potential Impacts	Economic impacts. Overloaded utility grids
Cause Injury or Death	Injury and potential deaths
Potential Facility Shutdown	Days to weeks

Hazard Effects

Temperatures vary widely over the course of a year, but each season has general temperature ranges associated. Summer and winter have, generally, the highest and lowest range of temperatures, respectively. When the temperature is consistently greater than the normal in summer meteorologists refer to it as a heat wave, which is defined as "temperatures of ten or more degrees above the average high temperature persist across the geographic region for several days or weeks" (Haddow, Bullock, & Coppola, 2014, pg.51.) These conditions can be a contributor to drought conditions when combined with a lack of rainfall. Excessive heat has a history of being deadly. In the United States "more than 1,500 die from exposure to excessive heat" (Haddow, Bullock, & Coppola, 2014, pg.52.) These conditions can also have serious impacts on crops, causing below average harvests. Repeated years of extreme temperatures can easily cause significant economic impacts on agricultural industries.

While there is no widely accepted definition of extremely cold temperatures, periods of colder than average conditions can cause an array of negative consequences depending

on their duration (Haddow, Bullock, & Coppola, 2014, pg.51.) Extremely cold temperatures are immediately dangerous to both humans and livestock by causing frostbite and hypothermia which can lead to permanent injury and death. In unprotected structures cold temperatures can freeze water pipes causing them to burst upon thawing, leading to significant damage. Cold snaps during typically warmer weather during the growing season can damage and destroy some crops, depending on their sensitivity to temperature.

The National Climatic Data Center (NCDC) tracks four types of extreme temperatures: Cold/Wind Chill, Extreme Cold/Wind Chill, Heat, and Excessive Heat.

- **Cold/Wind Chill:** Period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory (typical value is -18 F or colder) conditions, on a widespread or localized basis. There can be situations where advisory criteria are not met, but the combination of seasonably cold temperatures and low wind chill values (roughly 15 F below normal) must result in a fatality.
- **Extreme Cold/Wind Chill:** A period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria (typical value around -35 F or colder), on a widespread or localized basis. Normally these conditions should cause significant human and/or economic impact.
- **Heat:** A period of heat resulting from the combination of high temperatures (above normal) and relative humidity. A Heat event occurs whenever heat index values meet or exceed locally/regionally established advisory thresholds or a directly-related fatality occurs due to the heat event.
- **Excessive Heat:** Excessive Heat results from a combination of high temperatures (well above normal) and high humidity. An Excessive Heat event occurs and is heat index values meet or exceed locally/regionally established excessive heat warning thresholds, on a widespread or localized basis (National Weather Service Instruction 10-1605, 2007).

Hazard Profile

In the prior 19 years, there have been a number of excessive temperature events, shown in the table below. Cold/Wind Chill and Extreme Cold/Wind Chill clearly make up the majority of extreme temperature events in Region 4, accounting for 126 of the 203 events

Type	Total
Cold/Wind Chill	92
Extreme Cold/Wind Chill	34
Heat	43
Excessive Heat	34
Total	203

between 1996 and 2015.

County	Total	Deaths	Property Damage ($)	Crop Damage ($)
Fayette	48	0	$ 45,000.00	$ -
Greenbrier	3	0	$ -	$ 5,000.00
Nicholas	45	1	$ 53,000.00	$ -
Pocahontas	56	0	$ 45,000.00	$ -
Webster	51	0	$ 45,000.00	$ -
Total	203	1	$ 188,000.00	$ 5,000.00

The table above breaks down the events by county and illustrates the damages caused by these events. Over the 19 year study period, extreme temperature events have caused nearly $200,000 in reported property damage, and $5,000 in reported crop damage. These figures could be much higher as crop damage due to excessive heat is difficult to differentiate from crop damage due to drought since these two events often occur concurrently.

Historical Occurrences

- January 21st and 22nd, 2014

  A 79 year old Nicholas County man, who suffered from dementia, is believed to have frozen to death. He was last seen on the 20th, the day before the snow arrived. He apparently made a wrong turn, drove several miles along a remote mountain road near Muddlety. His vehicle got stuck in an old snow cover. He apparently spun the wheels so much that his car caught fire. He walked off and his body was not found until the 23rd. Temperatures were in the 20s during the daylight hours of the 21st, then dropped to below zero that night. The date of his death was estimated on the 21st (NCDC).
- March 8th – March 12th, 1996

  Record breaking low temperatures from the 8th through the 12th damaged some fruit trees and berry crops. Greenbrier County reported $5K in crop damage. Low temperatures during this period were mostly in the single numbers. Some of the higher elevations reported low temperatures below zero (NCDC).

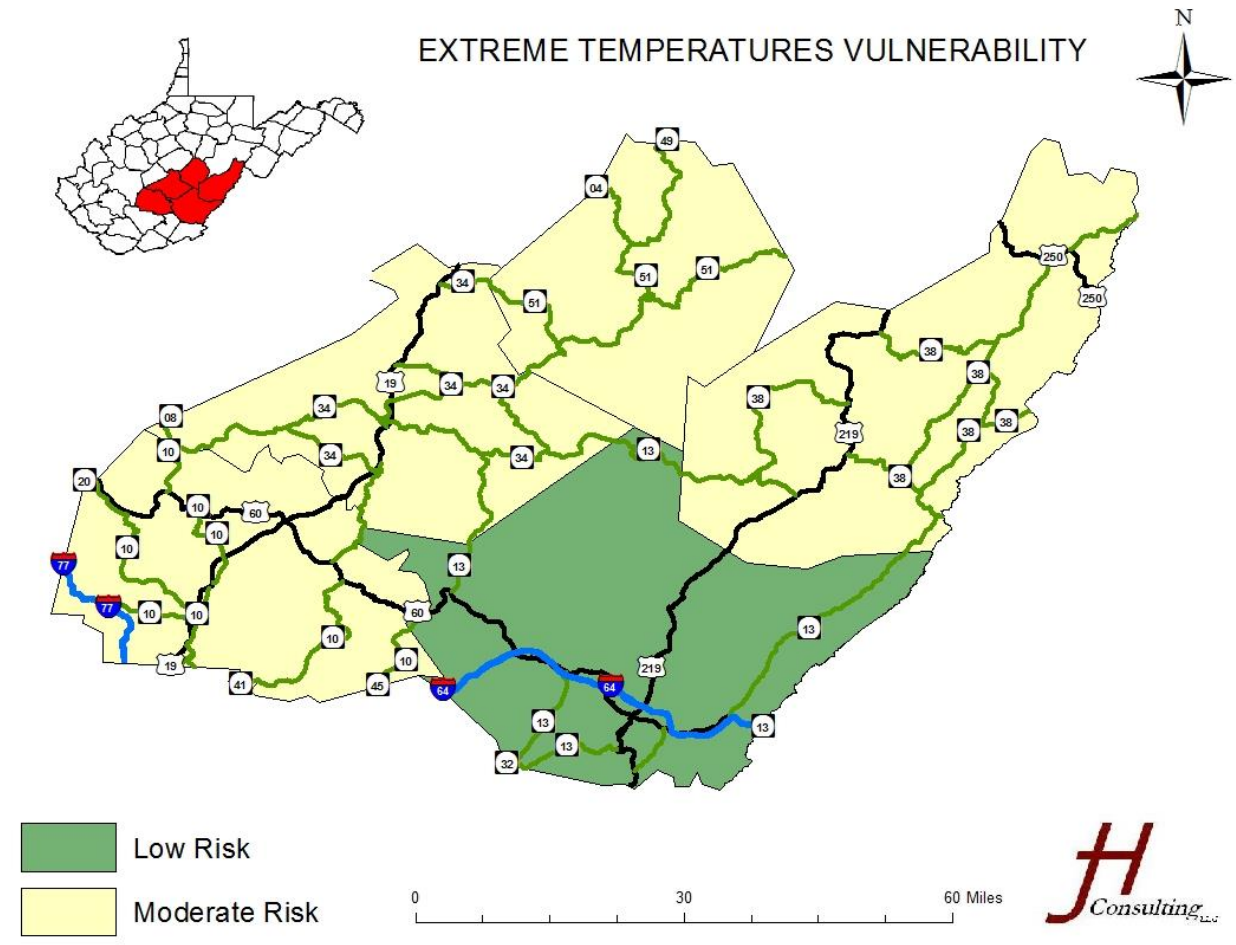
Loss Estimates

Historically, the property and crop damages listed in the hazard profile are all associated with cold temperature events rather than heat events. By taking the average of the property damage per a cold temperature event a figure of $1,492.06 of property damage per an extreme cold event can be reached. For a yearly estimate of property damage from

cold events the average per event amount is multiplied by the historical probability of 10.68 (203 historic events / 19 years.) This results in a yearly property damage estimate of $15,935.20 for the region.

For crop damage to occur, the event generally has to occur during a portion of the growing season. The only historical event occurred in Greenbrier County in early March and led to $5,000 in damage. High temperatures can also be, and often are, associated with droughts. The agricultural loss of droughts is further discussed in the drought profile.

Risk Map



FLOODING

"An overabundance of water that engulfs land and other property that is normally dry" (Haddow, Bullock, & Coppola, 2014, pg.32.)

Research Sources:

- NOAA National Climatic Data Center (NCDC)
- National Flood Insurance Program (NFIP)
- FEMA TEIF 2.0
- Local Officials

Period of Occurrence	Flooding has historically occurred any time of the year.
Number of Events (1996-2015)	187[iv]
Probability of Event	9.8
Warning time	None to significant depending on the event.
Potential Impacts	Impacts to all aspects of life: safety, health and economic. Utility damage and outages, structural and infrastructure damage, fire, loss of critical facilities.
Cause Injury or Death	Injury and moderate risk of death.
Potential Facility Shutdown	Days to weeks

Hazard Effects

Flooding is probably the highest priority hazard for all five counties in Region 4. The geography of the region contributes highly to this, with low lying areas adjacent to several large waterways, including the New and Gauley rivers. There are a number of types of flood, each with their own time frame. River floods typically develop over a period of days and occur when a river gradually rises and overspills its banks. These floods can be attributed to large amounts of rain or snowmelt both in the region impacted and upstream. Due to their nature of gradually building up, these types of floods will typically have a warning period of a few days. Of the 187 flooding events compiled by the National Climactic Data Center (NCDC) between 1996 and 2015, 67 were this type.

The other type discussed in this section is a flash flood. According to the National Flood Insurance Program (NFIP), flash floods are the most common severe weather emergency in the United States (2016.) The NFIP also states that a flash flood is defined as "a rapid flooding of low-lying areas in less than six hours, which is caused by intense rainfall from a thunderstorm or several thunderstorms" (2016). Flash floods are a common concern in the region and have historically occurred frequently. Of the 187 flooding events compiled by the NCDC in the studied time period, 120 were classified as flash floods. Flash floods

develop more quickly that river flooding, and are harder to predict. Unlike river flooding, flash floods can occur in many places that river flood does not. These areas are less prepared for flooding, leading to greater danger and potential for property damage.

The third type of flooding is cause by dam failures, which are discussed in more detail in the "Dam Failure" section of this plan.

Hazard Profile

Historical Flooding Events in Region 4 (1996-2015)			
County	*Number of Events*	*Property Damage ($)*	*Crop Damage ($)*
Fayette	25	$ 51,899,000.00	$ -
Greenbrier	60	$ 6,990,000.00	$ 50,000.00
Nicholas	32	$ 6,165,000.00	$ -
Pocahontas	32	$ 4,290,000.00	$ -
Webster	38	$ 3,282,000.00	$ -
Total	187	$ 72,626,000.00	$ 50,000.00

The number of flooding events recorded by the NCDC and their economic costs are shown in the table above. Fayette County gives an example of the unpredictability and destructive force of flooding. Of the total of over $51 million in property damage, $47 million is attributed to the flood of July 8th, 2001.

Since the Greenbrier County Commission began using Hazard Mitigation Grant Program (HMGP) funds to acquire properties at risk of flooding there have been 58 buyouts. Twenty-three (23) of these were then deeded to the municipality that the property resides in. The remaining 35 are leased by the Greenbrier County Commission.

June 2016 Flooding

On Thursday June 23, 2016 heavy rains swept through the Mid-Ohio Valley and into southern West Virginia, dropping large amounts of rain on the region. Over the span of the afternoon, Nicholas County saw between 3 and 4 inches of rain, with some areas seeing up to 5 inches according to the National Weather Service. The flooding resulted in states of emergency being declared by the Governor in 44 of the 55 counties in the state, with 22 deaths and millions of dollars in damages. Large portions of the town of Richwood, in Nicholas County, were under water and public safety personnel from around the state were assisting with rescuing those trapped by the rapid flooding (Desrochers & Beck, 2016).

These scenes repeated themselves around much of the southern areas of West Virginia. Multiple water rescue teams were activated in Kanawha County, with 37 active rescues being recorded by 7 p.m. that day, mostly in the Clendenin area. Also near the Clendenin area, Interstate 79 was closed in both directions after a mudslide covered the highway. A culvert at the entrance to the Crossing Mall in Elkview was destroyed by the flooding, stranding workers and customers in the mall. The Greenbrier Resort, in Greenbrier County, was cut off from the rest of the county with the closing of U.S. 60, stranding employees and guests. By the evening of the 24th, Appalachian Power was reporting more than 34,000 customers without power. In addition to the large rain totals, the storm line produced wind gusts in excess of 60 mph according to the National Weather Service (Desrochers & Beck, 2016).

The speed of the flooding was demonstrated in White Sulfur Springs, in Greenbrier County. In less than an hour of heavy rains, Howard's Creek overflowed its banks and engulfed whole neighborhoods. Dozens of homes in the area were destroyed, forcing 150 people into a shelter set up at the civic center on the night of 24th. There were 15 confirmed deaths in Greenbrier County (Gutman, 2016).

There were twelve water rescues performed in Webster County overnight on the 24th according to the Webster County Emergency Manager Richard Rose. "Everything from vehicles to campers to boats to homes knocked off the foundation and numerous propane tanks floating down the river" (Beck & Kersey, 2016).

The economic damage from these storms, including both the flooding and strong winds, will take weeks, if not months or years, to fully quantify.

Historical Occurrences

July 8th, 2001

In a 3 to 6 hour period, rains of 3 to 5.5 inches were common within that band. Maximum rain rates of 1.5 to 2.5 inches per hour occurred. Upslope, into these higher elevations, likely aided these rain amounts. Despite the initially dry top soil and low stream levels, the steep terrain and narrow valleys were quickly saturated (NCDC). As explained by Brown in his report on the event,[v] an average of 5 inches of rain fell in the Fayette county area within a twenty four hour period (2002). While the damage was extensive in a number of areas in the region, Fayette County was the hardest hit, accumulating up to $14 million worth of road damage and $11 million worth of damage to local water and sewer infrastructure, leading to a county wide boil water advisory (Brown, 2002). For many affected residents, this flood was

not a matter of property loss, but of survival. Many along the small streams had to escape "walls of water" within minutes (Brown, 2002). A father of a family in Dorothy thought, "We'll never get out of this alive" (Brown, 2002). Water roared out of the hollows and onto the wider valleys, carrying trees, rocks, mud, and pieces of homes. As the steep topsoil turned into a liquid, considerable damage was done to dwellings, due to the runoff and debris slides (NCDC.) Fayette County, along with 23 other counties was declared a federal disaster area. Brown's observation that "houses, cars, roads, and utility services were washed away in areas that had never flooded before" perfectly showcases just how dangerous and damaging flash flooding can be (2002.)

March 13th, 2010

After a cold and snowy February, a switch to a warmer pattern began during the second week of the month. This started the runoff from a deep snow pack over the West Virginia mountainous counties. A widespread 2 to 4 inches of water resided in the snow pack with some ridgetops exceeding 6 inches of water in the snow. Flood concerns were high preceding the event, but mainly for the central and northern mountain counties of the state. The deepest snow cover still resided across the high terrain in those counties. Prior to the heavy rain, the snow cover over Fayette and Raleigh Counties had already melted away. However, the ground was left soggy and primed to allow for a quick runoff. Oak Hill in Fayette County had 2.95 inches ending at dawn on the 13th. Major small stream flooding was widespread in Raleigh and Fayette Counties. There were 2 direct fatalities from Raleigh County. Flooding of less severity occurred in Kanawha, Nicholas, Boone, and Wyoming Counties. No homes were destroyed in Fayette County, but 38 homes had major damage. Several vehicles were flooded. Damage to the public infrastructure was estimated at around a half million dollars (NCDC).

July 13th, 2015

In a northwest flow aloft, clusters of showers and thunderstorms formed during the evening hours on the 12th. Two distinct areas of heavy rain occurred, including toward dawn on the 13th over the headwaters of the Elk River from Sutton to Webster Springs and to a lesser extent south into Nicholas County around Richwood. Webster Springs observed 3.06 inches. Numerous roads were closed by flooding streams or runoff and debris off mountainsides. This included Route 15 and 20 between Webster Springs and Diana. Runoff came off the steep mountainsides and ran through the streets of Webster Springs. Water

came down off of Spillman Mountain. The mountainside had a 26 percent grade or slope. The small unnamed stream overflowed. Its water ran down Euclyde Street and tore up the asphalt on Miller Mountain Road in front of the hospital. Water got inside the hospital too, causing it to close temporarily. The kitchen area of the hospital was most affected. A few windows were shattered (NCDC).

TEIF 2.0

In early 2016, the Federal Emergency Management Agency's Region 3 office introduced the Total Exposure in Floodplain (TEIF) 2.0 project for Region 4, a follow up project to both the FEMA Average Annualized Loss (ALL) and TEIF 1.0 projects. The goal of this program is to give the region risk predicting ability for planning. The project assigns all structures in the region a value based on the assessed value of the census block the structure is located in. Values are assessed equally to all structures in the analysis. The flood plain is then overlaid on the data and the value of all structures that are within that flood plain is tallied. The results of this analysis are seen below.

Community	County	Total Exposure
Fayette County[vi]	Fayette	$ 124,524,016
White Sulphur Springs City	Greenbrier	$ 115,254,996
Greenbrier County	Greenbrier	$ 111,280,674
Webster County	Webster	$ 101,076,331
Marlinton Town	Pocahontas	$ 90,094,837
Nicholas County	Nicholas	$ 83,926,765
Richwood City	Nicholas	$ 81,652,468
Pocahontas County	Pocahontas	$ 61,644,470
Addison (Webster Springs) Town	Webster	$ 33,888,049
Ronceverte City	Greenbrier	$ 20,591,132
Alderson Town	Greenbrier	$ 20,355,353
Mount Hope City	Fayette	$ 19,844,090
Summersville Town	Nicholas	$ 10,604,799
Smithers City	Fayette	$ 7,374,658
Cowen Town	Webster	$ 7,106,272
Montgomery City	Fayette	$ 7,053,848
Pax Town	Fayette	$ 5,230,553
Rupert Town	Greenbrier	$ 3,626,134
Oak Hill City	Fayette	$ 3,590,888

Rainelle Town	Greenbrier	$ 3,140,795
Camden-On-Gauley Town	Webster	$ 2,511,639
Meadow Bridge Town	Fayette	$ 1,452,759
Falling Spring Town	Greenbrier	$ 903,000
Gauley Bridge Town	Fayette	$ 812,556
Durbin Town	Pocahontas	$ 224,667
Ansted Town	Fayette	$ 126,364
Fayetteville Town	Fayette	$0
Quinwood Town	Greenbrier	$0
Thurmond Town	Fayette	$0
Lewisburg City	Greenbrier	$0
Hillsboro Town	Pocahontas	$0

As shown in the table, the unincorporated areas of Fayette County have the highest assessed risk in the TEIF 2.0. The highest ranked municipality is While Sulphur Springs, ranking higher than the other four counties in the region. Region 4 has $917,892,111 in total exposure as calculated by the TEIF 2.0 analysis. The analysis also enables us to report the number of structures that are at risk. For Region 4 there are 5,646 structures identified as being at risk from flooding.

Loss Estimates

The National Climatic Data Center records show that of the 187 flooding events that occurred between 1996 and 2015, 120 were flash floods and 67 were non-flash floods. Reported property damage, historically, has averaged $137,774 per a flooding event in Region 4.[vii] Non-flash flooding events cause more property damage, on average $217,014.93/event. Flash flooding, while more common, causes $91,383.33 in property damage on average.[viii]

Using the historical probability of a flooding event, which equals 9.8 events per year (187 events / 19 years), it is possible to estimate the yearly loss using the average per event property loss. It is estimated that flooding will cause $1,350,185 in property loss yearly. Flash floods, which are 64% of flooding events, will account for $864,118 of this loss while other flooding will account for $486,067. The worst case scenario (WCS) for flooding based on the research is the flood of June 8th, 2001, the details of which are discussed in the historical occurrences section of the profile. That single event caused a reported $47 Million

in property damage, which is nearly more than double all over flooding events since 1996 combined.

Vulnerable Structures

The TEIF 2.0 data also includes the number of structures within Region 4 that are vulnerable to flooding. The analysis shows that 5,646 structures are within the flood plain, and thus are vulnerable to effects of flooding. These structures, however, are not the only structures that are vulnerable. Flash floods can occur and do occur outside the flood plain, and are significantly more common within Region 4. Thus structures in more areas of the region, especially low lying areas, are vulnerable than just those in the flood plain.

There is also the ability, using this application, to address what types of structures are at risk based on the analysis. Single family homes are the largest percentage of vulnerable structures, representing 40% of structures. It was noted in the planning area description that development is typically focused on the flat areas of the region, which are also typically located in valleys along rivers. This is supported by the TEIF results that show 25% of vulnerable structures are defined as “development sites.”

Structure Type	Sum	Percent
Abandoned	53	0.94%
Address/Conflated	31	0.55%
Camp/Bungalow	165	2.92%
Campground	3	0.05%
Church	29	0.51%
Commercial	161	2.85%
Cultural	3	0.05%
Development Site	1417	25.10%
Educational	14	0.25%
Fire Pond	4	0.07%
Government	21	0.37%
Healthcare	2	0.04%
Industrial	3	0.05%
Lodging	3	0.05%
Mobile Home	364	6.45%
Multi Family	25	0.44%
Other	848	15.02%
Other Commercial	12	0.21%

Other Residential	55	0.97%
Public Gathering	8	0.14%
Seasonal Home	126	2.23%
Single Family	2282	40.42%
Utility	17	0.30%
Total	5646	100.00%

National Flood Insurance Program Compliance

The following local governments in Region are participants in the National Flood Insurance Program (NFIP). Also included is the current effective date of the flood map.

Community Name	County	Current Effective Date Of The Flood Map
Ansted, Town Of	Fayette County	09/03/10(M)
Fayette County*	Fayette County	09/03/10
Fayetteville, Town Of	Fayette County	(NSFHA)[ix]
Gauley Bridge, Town Of	Fayette County	09/03/10
Meadow Bridge, Town Of	Fayette County	09/03/10
Mount Hope, City Of	Fayette County	09/03/10(M)
Oak Hill, City Of	Fayette County	09/03/10(M)
Pax, Town Of	Fayette County	09/03/10
Smithers, Town Of	Fayette County	09/03/10
Thurmond, Town Of	Fayette County	09/03/10
Falling Springs Corporation, City Of	Greenbrier County	10/16/12(M)
Greenbrier County*	Greenbrier County	10/16/2012
Lewisburg, City Of	Greenbrier County	(NSFHA)
Quinwood, Town Of	Greenbrier County	(NSFHA)
Rainelle, Town Of	Greenbrier County	10/16/2012
Ronceverte, City Of	Greenbrier County	10/16/2012
Rupert, Town Of	Greenbrier County	10/16/12(M)
White Sulphur Springs, City Of	Greenbrier County	10/16/2012
Alderson, Town Of	Greenbrier County	06/17/02
Nicholas County*	Nicholas County	07/04/11
Richwood, City Of	Nicholas County	07/04/11
Summersville, City Of	Nicholas County	07/04/11(M)
Durbin, Town Of	Pocahontas County	11/4/2010

Marlinton, Town Of	Pocahontas County	11/4/2010
Pocahontas County *	Pocahontas County	11/4/2010
Addison, Town Of (Webster Springs)	Webster County	01/06/12
Camden-On-Gauley, Town Of	Webster County	01/06/12
Cowen, Town Of	Webster County	01/06/12(M)
Webster County *	Webster County	01/06/12

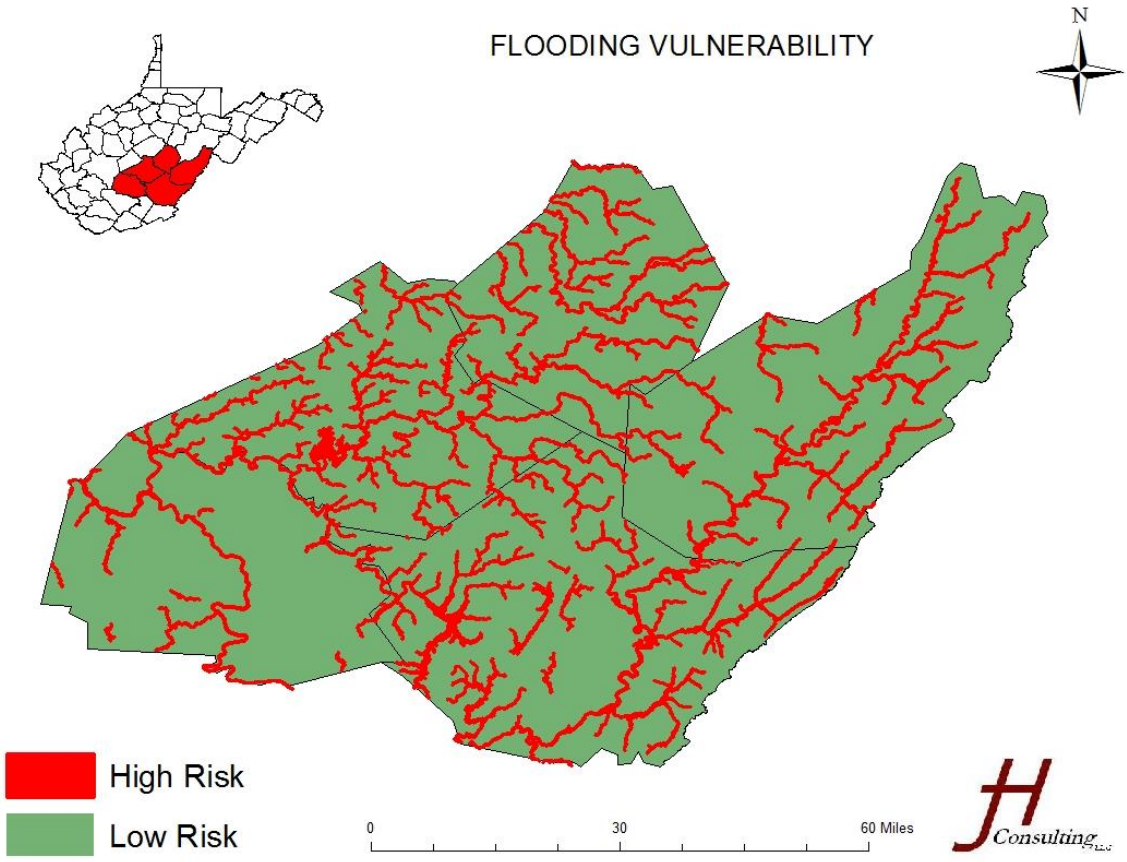
The NFIP also identifies the town of Thurmond, in Fayette County, as being a community with an identified hazard area that is not enrolled in the program. Each jurisdiction that is enrolled in the NFIP has a designated coordinator, also referred to as the floodplain manager. These individuals maintain the floodplain ordinance and ensure that any development is complaint with that ordinance. Generally floodplain managers/coordinators provide three services: floodplain identification, management and outreach.

As part of the NFIP, Repetitive Loss (RL) and Severe Repetitive Loss (SRL) properties are considered in assessing the risk and vulnerability of a community and inform future planning and development. RL properties are those for which two or more losses of at least $1,000 each have been paid under the NFIP within any 10-year period since 1978. SRL properties are residential properties that have at least 4 NFIP payments of over $5,000 each and the cumulative amount of such claims exceeds $20,000, or at least two separate claims payments with the cumulative amount exceeding the market value of the building (FEMA). The following is a list of these properties in Region 4.

County	Repetitive Loss Properties (RL)	Severe Repetitive Loss Properties (SRL)	Non-Residential Properties
Fayette	27	0	2
Greenbrier	38	1	2
Nicholas	15	0	2
Pocahontas	83	6	13
Webster	18	1	2
Totals	166	8	21

Jurisdictions throughout Region 4 have undertaken a number of flood mitigation projects. Since the last hazard mitigation plan update (in 2011), Fayette County completed a buyout and relocation project comprised of 240 properties. Greenbrier County mitigated 15 properties since 2011. In total, Greenbrier County has mitigated 58 properties.

Risk Map


FLOODING VULNERABILITY
N
High Risk
Low Risk
0
30
60 Miles
Consulting

HAILSTORM

Frozen precipitation in storm clouds that grow in size while cycling between freezing and non-freezing temperature areas, a process which can result in hailstones several inches in diameter. (Haddow, Bullock, & Coppola, 2014, pg.53.)

Research Sources:

- NOAA National Climatic Data Center (NCDC)
- NOAA National Severe Storms Laboratory (NSSL)
- Highway Loss Data Institute (HLDI)

Period of Occurrence	At any time, typically associated with thunderstorms.
Number of Events (1990-2015)	230
Probability of Event	9.2
Warning time	Small to moderate time frame.
Potential Impacts	Large hail can cause property and crop damage.
Cause Injury or Death	Injury
Potential Facility Shutdown	Minimal

Hazard Effects

The National Severe Storms Laboratory (NSSL), a division of NOAA, defines hail as "a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice" ("Severe Weather 101.) Hail can damage aircraft, homes, cars, and can even injure or be deadly to livestock. Obviously, the larger the size of the hail the more potential it has to cause damage or injury. The NSSL considers a severe hailstorm to contain hail that is one inch or more in diameter. This is approximately the size of a quarter.

Hazard Profile

All five counties in Region 4 are susceptible to hail storms, and have seen a number of such events in the previous twenty-five years, averaging 9.2 events per year. One reason for the regularity of these events lies in the geography of the region. As the NSSL points out, the freezing level of the atmosphere is much closer to the ground at higher elevations than at sea level. Updrafts do not have to carry the rain very far into the atmosphere before it freezes, unlike in areas such as Florida. Region 4, like much of West Virginia, is located

significantly above sea level. While some events over the past twenty-five years have caused significant damage, generally hail is a minor inconvenience in the region, rarely leading to damage or shutdowns of critical facilities or infrastructure.

County	# of Events	Average Magnitude(In)	Property Damage ($)
Fayette	55	0.92	$140,000
Greenbrier	81	1.00	$215,000
Nicholas	39	0.99	$84,000
Pocahontas	20	0.95	$7,000
Webster	35	0.94	$27,000
Total	230	0.97	$473,000

The table above shows the various totals related to hail storm occurrences for the last 25 years in Region 4. The average hail size in Region 4, at just less than 1 inch, is right at the level that the NSSL defines as being severe. The property damages, when compared with other events such as flooding, are fairly minor when dispersed over the 25 year research period.

Historical Occurrences

June 16th, 1998

Thunderstorms in southeastern West Virginia during the afternoon of the 16th produced hail up to 3 inches in diameter and damaging winds. Property damages in Greenbrier County reached $200,000 or more (NCDC).

April 7th, 2006

Well south of a cold front, severe thunderstorms moved through the southern coal fields of West Virginia. The time frame was late on a Friday afternoon and into the early evening. As this complex moved through Fayette and Raleigh Counties, large hail again occurred. Hail as big as golf balls fell around Beckley and Grandview. One major insurance company reported about 450 claims, mostly vehicular hail damage (NCDC).

May 26th, 2011

Severe thunderstorms developed on the afternoon of May 26th in a very unstable air mass across southeast West Virginia. These storms were primarily large hail producers. Large hail was reported in and around Lewisburg from a variety of sources. Hail sizes ranged from about 1 to 2 inches in diameter (NCDC).

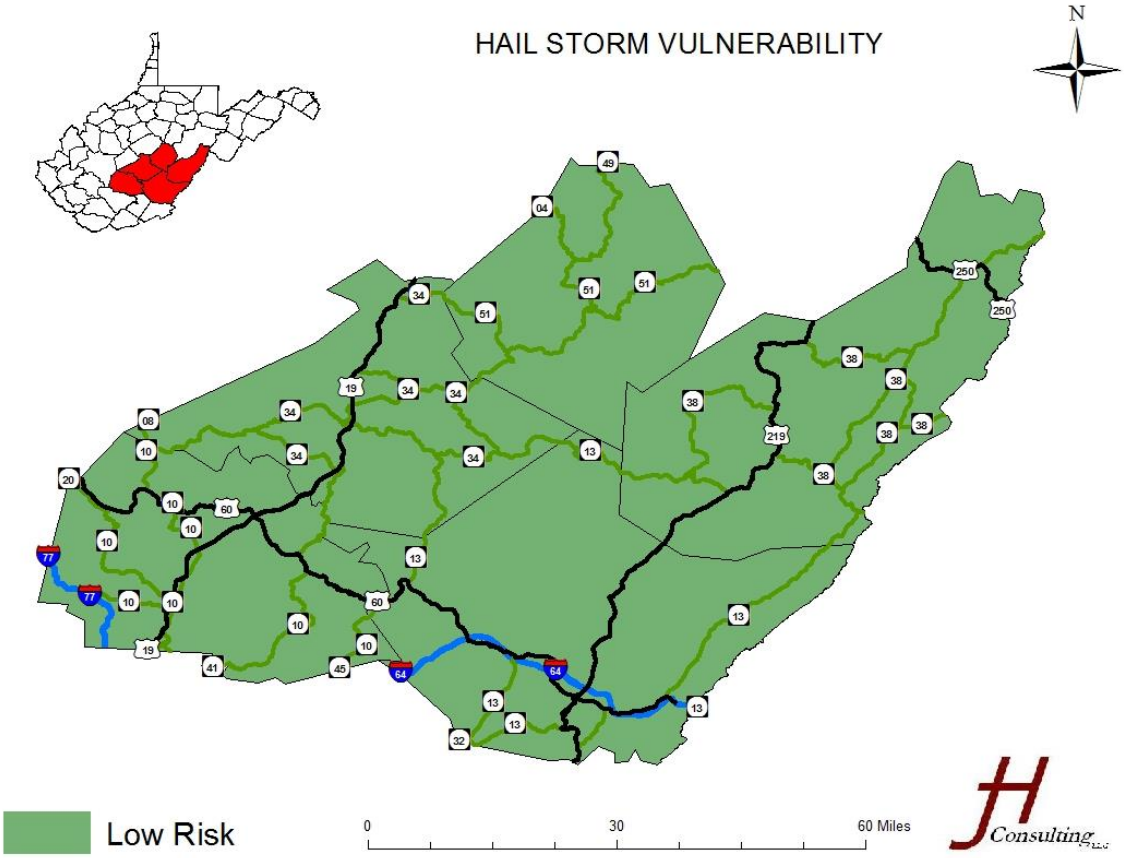
Loss Estimates

Based on the data from the National Climactic Data Center, the average hailstorm in Region 4 causes $2,056.51 in property damage. Based on the historic probability of 9.2 events occurring per a year (230 events over a period of 25 years), there will be an estimated property loss of $18,919.90 annually from hail storms. The worst case scenario, historically, is a loss of $100,000. This occurred on June 16th, 1998 in the Clintonville area of Greenbrier County and involved hail up to 3 inches in diameter.

One of the more well-known aspects of hail storms is that a significant amount of the damage is incurred by vehicles. A 2012 report from The Highway Loss Data Institute (HLDI), a division of the Insurance Institute for Highway Safety (IIHS), found that the number of vehicular hail damage claims nationally has increased significantly between 2008 and 2011. There were nearly 245,000 claims filed in 2011, compared to nearly 175,000 claims in 2008. The average severity of each claim in 2011 was $3,256.x According to the research from the HLDI in West Virginia in 2011 there were 1,992 claims for vehicle hail damage, averaging $2,135 for a total of $4,252,258.

Hail also has the ability, dependent on its magnitude, to cause significant structural property damage. Verisk Insurance Solutions used data collected from around the country, totaling nearly 9 million residential and commercial property hail claims between 2000 and 2013. The analysis shows a significant increase in hail damage claims in residential and commercial properties as well as an increase in average annual claim severity. During this timeframe, West Virginia had an average of 2,200 claims a year.

Risk Map


HAIL STORM VULNERABILITY
N
Low Risk
0
30
60 Miles
Consulting

HAZARDOUS MATERIALS

"Hazardous materials are chemical substances that if released or misused can pose a threat to environment or personal health" (Haddow, Bullock, & Coppola, 2014, pg.55.)

Research Sources:

- U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA)
- Department of Transportation (DOT)
- National Transportation Safety Board (NTSB)
- The Register-Herald
- The Roanoke Times
- Mountain Valley Pipeline project

Period of Occurrence	At any time
Number of Events (2010-2015)	91
Probability of Event	Infrequent
Warning time	None
Potential Impacts	Potential loss of life, economic loss, and environmental damage.
Cause Injury or Death	Potential for injury and multiple deaths
Potential Facility Shutdown	Days to weeks

Hazard Effects

The use of hazardous materials is prevalent in a large number of industries and products, including agriculture, medicine, and research. (Haddow, Bullock, & Coppola, 2014). The Emergency Planning and Citizen Right to Know Act (EPCRA) of 1984 requires facilities to report what chemicals they have on site and their quantities. The act also requires local governments to have emergency response plans in place.

The Pipeline and Hazardous Materials Safety Administration (PHMSA), a division of the U.S. Department of Transportation, tracks hazardous materials incidents that occur during transport. Between 2007 and 2015, the PHMSA recorded 159.295 total hazardous materials incidents during transportation. Of those, 88% (137,674) occurred on highways. Spills of hazardous materials are most difficult to plan for during transportation. While commodity flow studies give local jurisdictions a snapshot of what materials may travel through the area on any given day, responders will not know what materials, if any, are involved until an incident occurs.

Hazard Profile

The National Response Center Right-to-Know Network tracks and files incident reports across the country. According to this database, a total of 91 incidents have occurred in Region 4 between 2010 and 2015. A significant majority of these (75%; 70 of 91) have occurred within Fayette County. Fayette County is also the only county to have had fatalities reported in the data (6) and the only county where evacuations due to hazardous materials occurred.

As mentioned above, the majority of hazardous materials incidents occur during transport. This is confirmed in the data from the National Response Center which shows that 64% of reported incidents involved a mobile vehicle.

Region 4 is traversed by three major highways: US 19 which runs north/south through Fayette and Nicholas Counties, and I64 which runs east/west through Greenbrier County and runs north/south concurrently with I77 through Fayette County. The region is also crossed by other routes including US 219, US60, State Route 20, and State Route 92. The risk map below shows these routes and also shows the location of Tier 2 reporting facilities (as available from the County LEPC). A large number of these facilities are located near the transportation routes previously listed. It is important to note that the actual hazard zone for transportation accidents depends on the material and amount.

An important component of mitigating hazardous materials incidents is knowing what to plan for. For incidents during transit this is especially difficult, as there is no way of knowing the types of materials traversing the region at any given time. One way to reduce this uncertainty is to perform a Commodity Flow Study (CFS). While these studies represent a snapshot in time, they provide a starting point for planning.

Four of the five counties have completed commodity flow studies within the last several years. Pocahontas County, the only county without a CFS, is in the process of completing one in 2016.

<u>Fayette County (2012)</u>

A total of 155 hazardous materials were identified in the study, including six Extremely Hazardous Substances (EHSs). Of the hazardous materials identified in the study, 3.9% were not reported by any other analysis, including fixed facilities. It can be assumed that these materials simply pass through the county bound for destinations in other jurisdictions. A hazardous material event occurring along a roadway may involve a material not used or stored in Fayette County, and therefore unfamiliar to responders. Based on the

data collected, the overwhelming majority of hazardous materials transported in the county are transported along US 119.

Greenbrier County (2015)

A total of 28 different materials were identified in the study, of which 5 were Extremely Hazardous Substances. Nearly 40% of these substances identified along roadways were not reported by any other analysis, including fixed facilities. It can be assumed that these materials are passing through the county bound for other jurisdictions. A hazardous material event occurring along a roadway may involve a material not used or stored in Greenbrier County, and therefore unfamiliar to responders. The overwhelming majority of materials were observed along I-64, more than three times more than the main north south route through the county, US 219.

Nicholas County (2007)

Twenty separate specifically named materials were identified in this study, including two Extremely Hazardous Substances. Both of these were recorded on U.S. 19, as were 78% of all placarded vehicles. Three vehicles were carrying radioactive material according to their placards.

Webster County (2009)

Four different substances were recorded during the 2009 study, none of which were identified as Extremely Hazardous Substances. These substances were overwhelmingly limited to the major routes through the county, including State Route 20, State Route 15, and State Route 82.

In addition to hazardous materials located at fixed facilities and traveling through the region on the various highways and railroads, there is a proposed pipeline, the Mountain Valley Pipeline, which traverses large sections of Webster and Nicholas counties as well as the far western portion of Greenbrier County. A compressor station is planned for the Stallworth area of Greenbrier County as well. The pipeline will carry natural gas from the fracking fields of Northern West Virginia to Pittsylvania, Virginia (Adams, 2014). The Mountain Valley Pipeline is in the planning and development stage, with a stated goal to begin construction in December of 2016 (Mountain Valley Pipeline Schedule).

There is also concern within the region regarding the hazards of underground and above ground storage tanks in the wake of recent high profile events. Committee members relate that an underground storage tank in the town of Rainelle, in Greenbrier County, leaked into a drinking water supply well, contaminating it.

Historical Occurrences

January 30th, 2007

In late morning a propane explosion occurred at a Little General Store located in Ghent, W.V., in Raleigh County.[xi] The investigation concluded that propane leaking from one of the tanks found a source of ignition in the store, leading to the explosion. Four people were killed in the explosion including two firefighters and two private gas company employees (Register – Herald).

January 9th, 2014

A tank located adjacent to the Elk River just north of Charleston, WV[xii] leaked a hazardous chemical used for cleaning coal of impurities into the river. The leak occurred approximately 1.5 miles upriver from a water intake pipe the West Virginia American Water Company. The resulting contamination of the water supply left up to 300,000 residents in nine counties in southeastern West Virginia without potable water (The Washington Post, 2015).

February 16th, 2015

A CSX train hauling 107 cars of crude oil derailed in Mount Carbon, WV, an unincorporated community in Fayette County. The derailment of numerous rail tankers caused a large oil spill that then caught fire, consuming 19 railcars. The fire spread to a nearby house and garage, destroying both. It was eventually determined that 378,000 gallons of crude oil were released. Two water treatment plants near the crash were temporarily closed due to the oil spill (NTSB & DOT Reports, 2015).

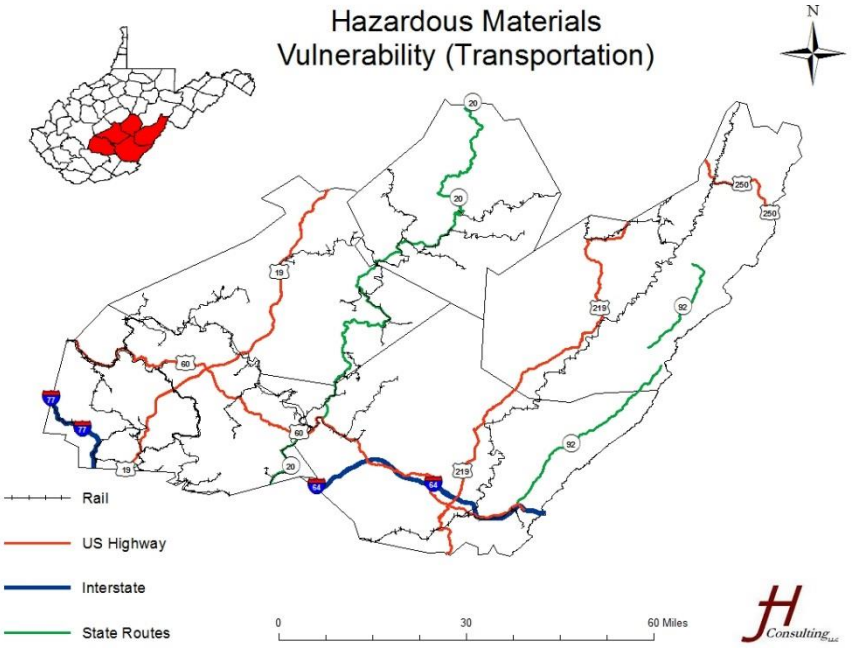
Loss Estimate

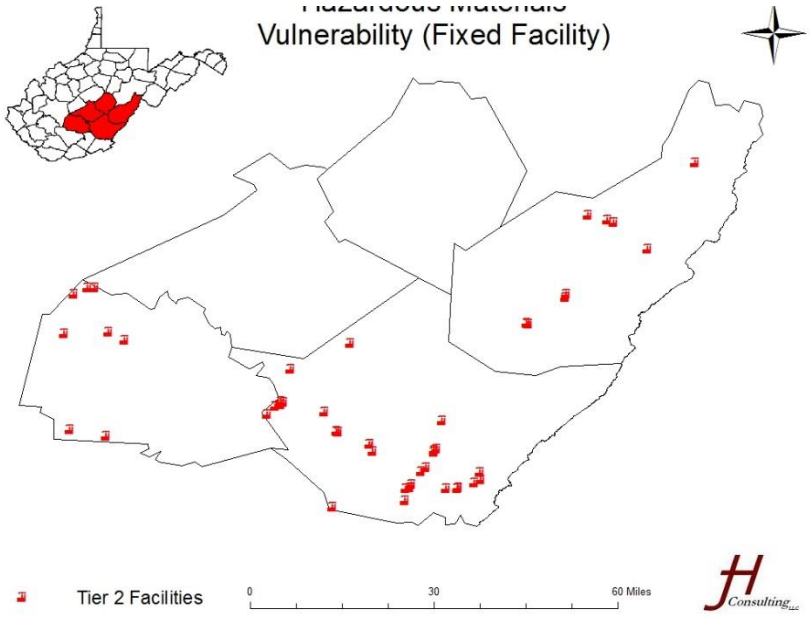
For a general, per-incident loss estimate, a static figure can be utilized. Battelle (2001) noted the average non-explosion loading/unloading hazmat incident results in losses of $5,000. This figure is corroborated by a five-year average using data from the Pipeline and Hazardous Materials Safety Administration (PHMSA). According to PHMSA data, the

average incident between 2010 and 2015 resulted in approximately $5,700 in losses. According to the Right-To-Know Network, there have been 26 incidents at a fixed site in Region 4 between 2010 and 2015. Using the average cost from the PHMSA it can be estimated that these incidents cost $148,200 in losses total, or $29,640 in losses per year.

Historically, there has been only one hazardous materials incident within Region 4 that resulted in any type of major structural damage. This lack of data makes it difficult to calculate an accurate loss estimate.

Risk Maps





MASS MOVEMENTS

"Mass movements include several different hazards caused by the horizontal or lateral movement of large quantities of physical matter" (Haddow, Bullock, & Coppola, 2014, pg.46.)

Research Sources:

- NOAA National Climatic Data Center
- USGS

Period of Occurrence	At any time. Increased chance following long periods of heavy rain, snowmelt or near construction activity
Number of Events (1997-2015)	2
Probability of Event	0.1
Warning time	Hours to months.
Potential Impacts	Damage to infrastructure, decreased land values, agribusiness losses and cost of litigation
Cause Injury or Death	Injury, possibly fatalities
Potential Facility Shutdown	Days to weeks

Hazard Effects

Mass movements cause damage and loss of life through several processes. Mass movements include pushing, crushing or burying objects in their path and the damming of rivers and waterways (Haddow, Bullock, & Coppola, 2014, pg.46). There are numerous categories of mass movements: landslides, mudflows, rock falls, avalanches, land subsidence and expansive soils.

Landslides[xiii]

Landslides occur when areas of relatively dry rock, soil or debris move uncontrollably down a slope. Landsides may be localized or massive in size and can move at high rates of speed.

Mudflows

Mudflows are water saturated rivers of earth, rock and debris. Mudflows develop when water rapidly accumulates in the material, such as during heavy rainfall or rapid snowmelt. Mudflows can develop and move quickly, giving little to no warning.

Rockfalls

Rockfalls occur when rocks or other materials detach from a slope or cliff and descend in a freefall, rolling or bouncing manner. Rockfalls can occur naturally, through faults and seismic activity, or as a product of human activity, such as blasting.

Avalanches

Avalanches are a mass of ice or snow that moves downhill at a high rate of speed. Avalanches have significant power and have been known to demolish buildings and completely obscure roads that are in their path. Avalanches can also be caused by a number of factors, including the exceeding of critical snow mass on a slope and human activity. The risk of occurrence increases as temperatures increase, destabilizing the snowpack.

Land Subsidence

Land subsidence is the loss of elevation cause by the removal of support below the surface. These events can range is size from large regional lowering to severe localized collapses, such as sinkholes. The primary cause of land subsidence is human activity such as mining and the extraction of groundwater or petroleum.

Expansive Soils

Expansive soils are soils or soft rocks that will swell or shrink depending on their moisture content. The swelling and shrinking action can cause extensive damage to transportation routes, such as highways and rail line, and structures that are built over these areas.

Hazard Profile

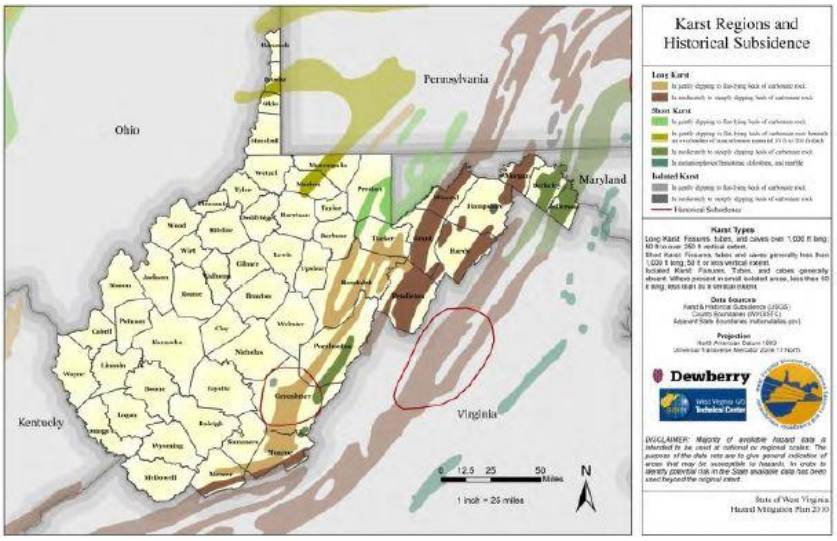
Karst Formations

The 2013 West Virginia Statewide Standard Hazard Mitigation Plan Update attempts to quantify the risk from land subsidence for the entire state. However, it is important to note that risk, in its traditional definition, cannot be easily applied to this hazard. The historical data is not extensive enough to do so. Rather, the 2013 state wide update uses the presence of karst geology to fill this gap. High percentages of karst geography, while not a perfect causation relationship with land subsidence, does have

enough correlation to be used as the probability of future occurrence. It is important to note that the state risk areas do not include areas underlain by coal, which is a large portion of Region 4.

Greenbrier County is identified in the state plan as one of the Karst Waters Institute's top 10 endangered areas. Additionally, parts of Greenbrier and Pocahontas counties have been identified by the West Virginia Mapping Panel as having particular environmental significance. According to the analysis in the state wide HMP update, Karst regions make up between 34% and 59% of both Greenbrier and Pocahontas counties.

The image below is from the most recent state wide HMP update. The map shown in the image shows that Long Karst formations (the light brown areas) cover a large area of Greenbrier County and some area of Pocahontas County. Additionally, Short Karst formations occur in the eastern section of Greenbrier County and the northeastern area of Greenbrier County. The red circled area, covering most of Greenbrier County and a small section of Pocahontas County, identifies areas of historical subsidence occurrences.



Other Mass Movements

The geography of the region also leaves it susceptible to other types of mass movements. Mountains with steep terrain carry risks of landfalls, mud flows and rock falls, while the highest elevations can carry the risk of avalanches in the winter and early spring.

Most counties in the region have not experienced a significant number of mass movements. Since 2007 there have been two instances of debris flow in Greenbrier County, as shown below. Both incidents resulted in $5,000 in property damage, and one person was killed in the 2015 flow. Data from the NCDC

Date	County	Time	Type	Death	Injury	Property Damage ($)
4/15/2007	Greenbrier	9:00	Debris Flow	0	0	$5,000
3/10/2015	Greenbrier	14:45	Debris Flow	1	0	$5,000

Historical Occurrence

March 10th, 2015

One woman was killed in Greenbrier County when a tree carried by a landslide smashed into her car in the afternoon of March 10th. Greenbrier County Emergency Management stated that mudslides were more likely to happen due to all the rain and snow melt (KWWL, 2015.)

July 13th, 2015

A large landslide covered a section of WV Highway 82 approximately 2.6 miles east of Birch River, in Nicholas County. The WV Division of if Highways estimated that they removed 5,000 tons of material from the roadway over two days. The road was closed from Monday, July 17th through the following Friday evening.

Loss Estimate

As demonstrated in the hazard profile, mass movements can consist of any number of events. Some may form quickly and other more gradually occurring, but either can cause serious and costly damage to structures and infrastructure.

The West Virginia Statewide Standard HMP Update lists the number of crucial facilities that are located in Karst zones in the state. In Greenbrier County there are twenty-four of these facilities:

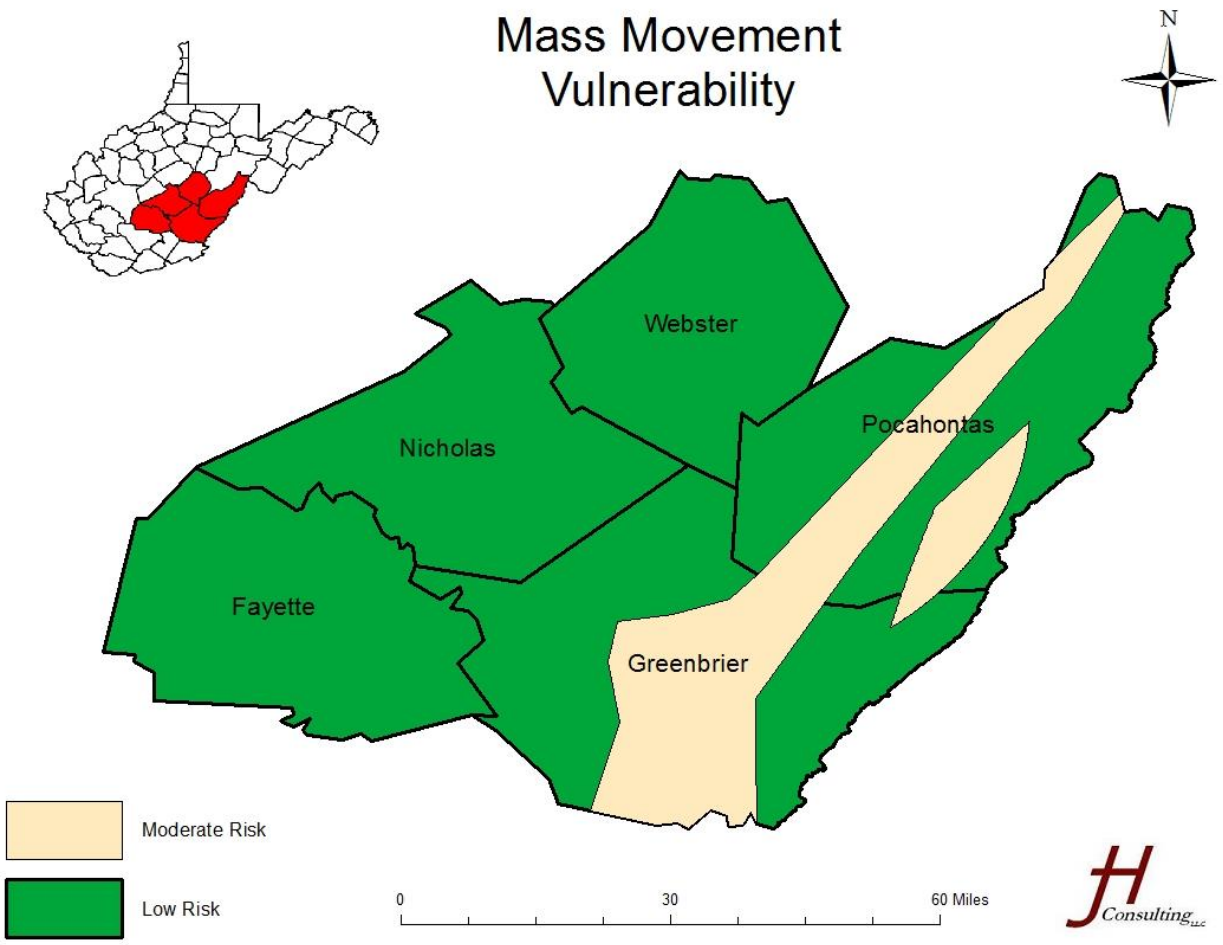
- Four law enforcement facilities,
- Ten fire stations,
- One hospital,
- Eight K-12 schools, and
- One Emergency Operations Center (EOC).

Pocahontas County, also identified as being at risk, has eight facilities located in Karst zones:

- Two law enforcement facilities,
- Three fire stations, and

- Three K-12 schools.

Risk Map



TERRORISM

"The use of force or violence against some individuals (civilians) or property for purposes of intimidation, coercion, or spreading feat in order to attain a political, religious or ideological goal" (Haddow, Bullock, & Coppola, 2014, pg.56.)

Research Sources:

- Department of Homeland Security Federal Emergency Management Agency (FEMA)

Period of Occurrence	At any time
Number of Events (1997-2015)	0
Probability of Event	Low
Warning time	Minimal. Depends on the threat and detection of actors.
Potential Impacts	Potential loss of human life and significant injury. Economic loss, environmental damage, distribution of lifeline facilities.
Cause Injury or Death	Risk of multiple injuries and deaths.
Potential Facility Shutdown	Days, weeks or more.

Hazard Effects

Throughout this profile, terrorism will be discussed in general terms. This discussion will not include information on any threats that have been received, specific listing of potential targets in the region, etc. In the course "Are you ready? An in-depth guide to Civilian Preparedness" (IS-22), The Federal Emergency Management Agency (2014) makes the following statement:

> 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.

Hazard Profile

All the counties in Region 4 have what would be considered targets for terrorist attacks. Generally governmental buildings, industrial facilities and anywhere were large crowds gather can be considered targets. The type of target chosen will typically reflect the nature of the terrorist's movement and motivation. For example, anarchists might wish to attack government facilities while ecological terrorists will focus on targets affecting the environment, such as mining or foresting sites.

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 Region 4, 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 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.

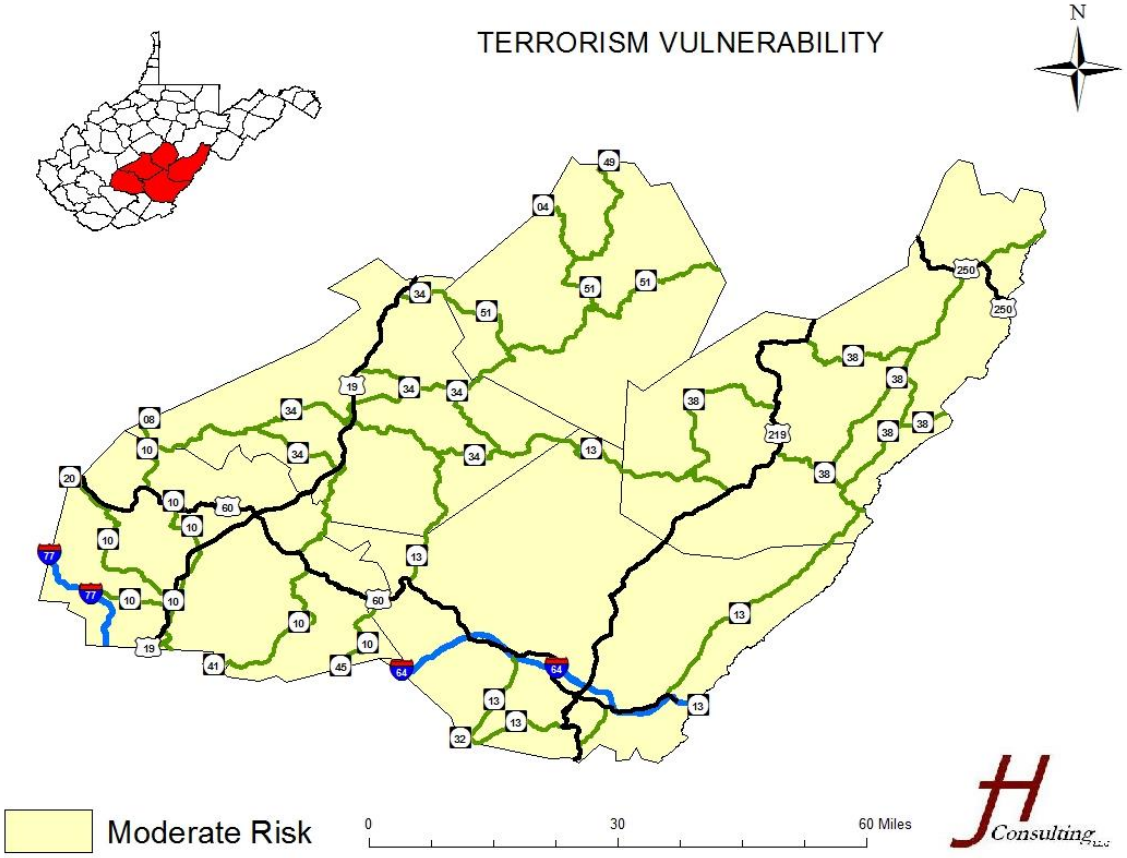
The most obvious effects of a terrorist incident would be economic. Infrastructure, including "hard" infrastructure such as facilities and systems, but also "soft" infrastructure such as people could be diminished or destroyed. Any loss of tax base and employment would be extremely hard for the communities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

Loss Estimate

Region 4 has a number of structures that might be considered vulnerable to terrorism. The New River Bridge, in Fayette County, hosts a large yearly event that can potentially be targeted both for the number of attendees and the important of the bridge. Other infrastructures, such as the Summersville Dam or the West Virginia American water treatment plant on the New River are potential targets. The Region's resource and recreational industries are other potential targets for environment terrorists. These locations

may be seen as “blights” on the natural environment. Calculating a numerical loss estimate for this type of hazard is both difficult and impractical. Any such event would likely lead to social disruption on top of the physical destruction.

Risk Map



THUNDERSTORM

"Thunderstorms are meteorological events that bring heavy rains, strong winds, hail, lighting and Tornadoes" (Haddow, Bullock, & Coppola, 2014, pg.51.)

Research Sources:

- NOAA National Climatic Data Center

Period of Occurrence	Spring, summer and fall
Number of Events (1990-2015)	304 Thunderstorm Wind 7 Lightning Events (1997-2015)
Probability of Event	12.16 (Thunderstorm Wind) 0.98 (Lightning)
Warning time	Minutes to hours[xiv]
Potential Impacts	Utility damage and outages, infrastructure damage. Possible impacts on life, health and safety.
Cause Injury or Death	Injury, possible death
Potential Facility Shutdown	Days

Hazard Effects

The wind gusts and lightning associated with thunderstorms can pose a threat life and property. Thunderstorms also have the potential to produce hail and tornadoes, which are discussed elsewhere in this risk assessment. Thunderstorms are typically associated with cold fronts and can move in "lines," meaning that a location can possibly be struck by several storms in the course of minutes or hours. The heavy rainfall associated with one or multiple storms has been known to create flash floods in the presence of oversaturated soils. A major secondary threat associated with thunderstorms is lighting. Individual lighting strikes occur with no warning and kill between 75 and 100 Americans every year (Haddow, Bullock, & Coppola, 2014, pg.51.)

Hazard Profile

Thunderstorms are one of the most frequently occurring hazards in Region 4. The tables below show the number of thunderstorm wind events and lightening events recorded by the National Climatic Data Center.

Thunderstorms				
County	# of Storms	Deaths	Injuries	Property damage ($)
Fayette	75	0	10	$3,254,500
Greenbrier	119	0	2	$1,868,050
Nicholas	46	0	0	$2,231,000
Pocahontas	19	0	1	$906,500
Webster	45	0	0	$1,292,000
Total	304	0	13	$9,552,050

Lightning				
County	# of Strikes	Death	Injury	Property Damage ($)
Fayette	3	1	11	$16,000
Greenbrier	3	0	0	$8,000
Nicholas	1	0	0	$50,000
Pocahontas	0	0	0	$0
Webster	0	0	0	$0
Total	7	1	11	$74,000

Since 1990, thunderstorm wind events have injured thirteen people and cost nearly $10 million in property damage. Between 1997 and 2015, lighting strikes have killed one person and injured 11 in region 4, while causing $74,000 in property damage. The NCDC only has records of storms where there was potentially damaging winds or lightning strikes. Thunderstorms are common throughout the spring and summer months that may be strong enough to down trees and power lines. Residences and businesses in Region 4 may incur damage from these smaller storms that is not accurately reflected in the historical data.

Vulnerable Populations

There are populations within Region 4 that may have more difficulty dealing with the secondary effects of thunderstorm winds, power loss being chief among these. The elderly and institutionalized are particularly susceptible to power loss. Many of the elderly, and those who are in nursing homes / long term care facilities, rely on supplemental oxygen. This is typically supplied by condensers, with a reserve of bottled oxygen for travelling and for emergencies. This reserve supply will most likely only last a few days at the most. Long term outages, like those faced in the Derecho of 2012, can easily surpass these oxygen reserves, placing the elderly and those in long term care facilities without generators at significant risk.

The map below shows the thunderstorm risk map overlaid onto the elderly social vulnerability layer, to identify census tracts with the highest percentages of elderly that will be the highest risk population in this scenario. The map identifies three census tracts in the highest category: two in Greenbrier County and one in Nicholas County. In these tracts, over 22% of the population is over the age of 65.

Historical Occurrences

February 29th, 2012

A warm front crossed the region during the afternoon of the 29th, and then a cold front approached the area during the evening. Numerous showers and storms developed in association with both of these fronts. Some of the storms increased to severe levels and produced damaging winds. Thunderstorms winds blew a tree over onto a truck that was traveling past the coal mine on Anjen Road. An occupant of the truck sustained a minor injury (NCDC).

June 29th, 2012

The “Derecho” of June 29th, 2012, affected all five counties within Region 4 as well as the entire state of West Virginia and surrounding states. A strong line of storms combined with abnormally high temperatures struck the area, severely damaging a number of structures. The wind associated with this event reached over 60 mph, resulting in widespread power outages as trees fell on transmission lines and utility poles were damaged. This event alone caused a reported $7.255 million in reported property damage, making it the single most expensive events in the study time frame and accounting for 75% of the reported property damage caused by thunderstorm wind in Region 4 since 1990 according to NCDC records. Events like this are rare but demonstrate the potential that thunderstorms have to cause significant structural damage havoc (NOAA).

June 1st, 2015

Thunderstorms formed during the afternoon along a front and strong temperature contrast across southern West Virginia. A few had downpours with local rain of 1 to 1.5 inches in an hour. After a dry month of May most areas needed the rain. However, a downpour in the city of Beckley caused poor drainage street flooding. Lightning struck a tree near where 3 teenage boys were fishing on a small residential pond. The location is off of

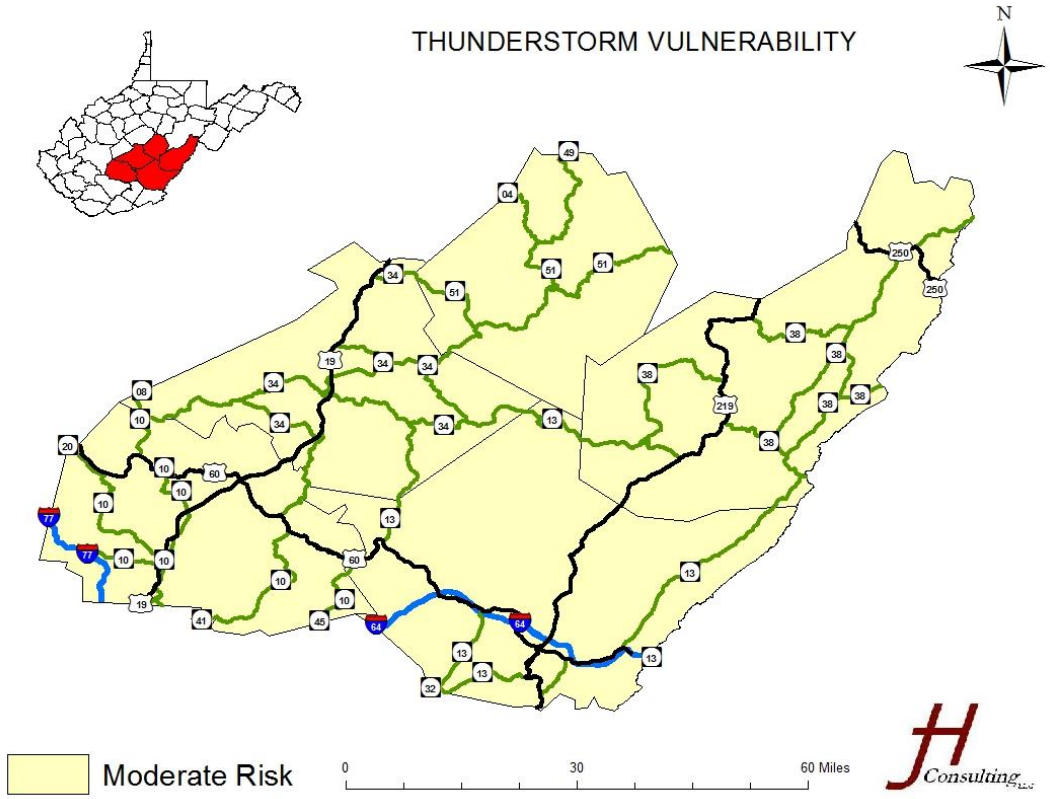
Elverton Road and near the Bridge Haven Golf Course. One boy died, the 2 others were injured (NCDC).

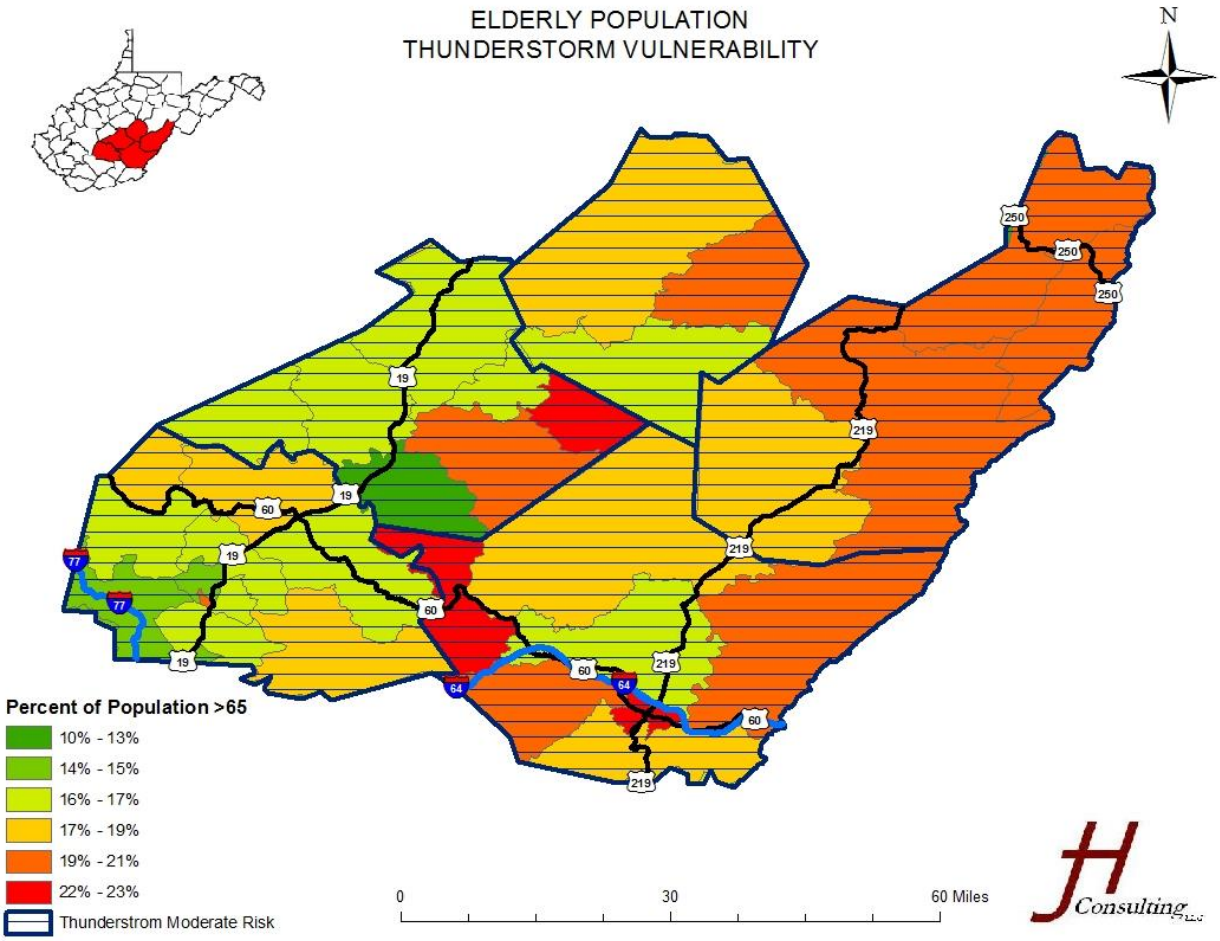
Loss Estimates

Loss estimates for thunderstorm winds and for lighting can be calculated using historical occurrences and losses. The probability of a thunderstorm wind event occurring is 12.16, meaning that an estimated 12 events will occur each year. The average property damage per a thunderstorm wind event is found by dividing the total property damage figure in the table above by the number of events, which equals an average of $31,421 per an event. Therefore, in a year it is estimated that thunderstorm wind will cause an estimated $377,052 in property damage. The same process finds that lighting will cause an estimated $10,571 in property damage yearly.

The worst case scenario (WCS) is also based on historical research. The worst (in property damage terms) thunderstorm wind event occurred on June 29th, 2012 in Fayette County and caused $3 million in damage. The worst property damage lightning event occurred in Nicholas Count on May 5th, 1998 and caused $50,000 in damage. The worst life safety lighting event occurred on June 1st, 2015, when a lighting strike in Fayette County killed one and injured two.

Risk Maps


THUNDERSTORM VULNERABILITY
N
Moderate Risk
0
30
60 Miles
Consulting


ELDERLY POPULATION
THUNDERSTORM VULNERABILITY
N
Percent of Population >65
10% - 13%
14% - 15%
16% - 17%
17% - 19%
19% - 21%
22% - 23%
Thunderstrom Moderate Risk
0
30
60 Miles
Consulting

TORNADOES

"A rapidly rotating vortex or funnel of air extending groundward from a cumulo-nimbus cloud, exhibiting wind speeds of up to 300 mph" (Haddow, Bullock, & Coppola, 2014, pg.42.)

Research Sources:

- NOAA National Climatic Data Center
- The Tornado Project

Period of Occurrence	At any time. Primarily between March and August
Number of Events (1961-2015)	12
Probability of Event	0.22
Warning time	Seconds to minutes[xv]
Potential Impacts	Loss of life and severe property damage. Infrastructure damage
Cause Injury or Death	Potential to cause injury and death
Potential Facility Shutdown	Hours to days or more.

Hazard Effects

Tornadoes are typically associated with the strongest thunderstorms and are capable of causing tremendous damage. Tornadoes are measured on the Enhanced Fujita Scale (EF Scale) which categorizes these events based on wind speed. There are six categories in the EF Scale, from EF0 through EF5. An EF0 tornado will cause some minor damage, while an EF5 is considered to cause massive destruction. The following graphic developed by the Insurance Institute for Business & Home Safety and StateFarm shows the wind scales and the damaged expected in each category.

Tornadoes are historically very difficult to predict. The storms that may produce a tornado can be forecasted, but not every storm with that potential will spawn a tornado and predicting where and when that will happen is incredibly difficult. Historical trends show that some areas of the country, such as the Midwest plain states, have a higher probability of tornado occurrence. However, they can and have struck in many other areas.

	Description	Wind Speeds (mph)
EF0	Minor or no damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.	65-85
EF1	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.	86-110
EF2	Considerable damage. Roofs torn off well-constructed houses; foundations of frame houses shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.	111-135
EF3	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations badly damaged.	136-165
EF4	Extreme damage. Well-constructed and whole frame houses completely leveled; cars and other large objects thrown and small missiles generated.	166-200
EF5	Total destruction of buildings. Strong framed, well-built houses leveled off foundations and swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; some cars, trucks, and train cars can be thrown approximately one file.	>200

Hazard Profile

According to the National Climatic Data Center (NCDC), there have been 12 Tornadoes recorded in Region 4 since 1961. The table below shows the number of reported events broken down by county and their impacts.

County	Total	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
Fayette	3	1	8	$2,775,000	$0
Greenbrier	6	0	3	$3,052,500	$0
Nicholas	3	0	3	$258,500	$15,000
Pocahontas	0	0	0	$0	$0
Webster	0	0	0	$0	$0
Total	12	1	14	$6,086,000	$15,000

These events have been responsible for one reported death and fourteen reported injuries in the region while causing over $6 million in reported damages. One of these events, in the early morning hours of April 4th, 1974, traveled over 11 miles and caused extensive damage in both Fayette and Greenbrier counties. This event is counted twice in the study because the damage in broken down by county in the NCDC storm records. The most recent event occurred in Nicholas County on the evening of April 27th, 2011. This EF1 tornado caused $6,000 in property damage in $15,000 in crop damage with no reported injuries or deaths.

The table below shows the breakdown of these events by EF scale. The tornado of 1974 which affected Fayette and Greenbrier counties is the only EF3 on record, and the strongest recorded tornado to strike the region.

EF Scale	Total
0	1
1	4
2	4
3	2
4	0
5	0
Unk	1
Total	**12**

Vulnerable Populations

Structures that are less sturdy will be more vulnerable to damage from wind events such as Tornadoes. Tornadoes will cause a proportionally larger amount of damage when occurring in areas that have a high percentage of these structures, which includes mobile home. By overlaying the tornado risk map onto the social vulnerability data, it is possible to identify areas where this is most likely to occur. The graphics on the Risk Maps section below show the tornado hazard risk map layered over mobile home data for Region 4. There are two census tracts where over 28% of homes are mobile homes, and three census tracts where the percentage is over 23%. Four of these tracts fall within Nicholas County, with the remaining tract being in Fayette County.

Historical Occurrences

April 4th, 1974

Early in the morning of April 4, 1974 and F3 tornado impacted Raleigh, Fayette, and Greenbrier counties. The funnel stayed on the ground for over 32 miles according to the

NCDC records, and was reported to be over 30 yards in diameter. The event began in north eastern Raleigh County and moving east until crossing into Fayette County. The funnel cross the width of southeastern Fayette County, directly causing 8 injuries and 1 fatality before crossing into Greenbrier County. Another 3 injuries were reported in Greenbrier County before the funnel dissipated north of the unincorporated community of Williamsburg. According to NCDC records, this event caused $5 million in property damage in Fayette and Greenbrier Counties (NCDC, 2016).

June 22nd, 1990

In the afternoon of June 22nd, 1990, a tornado touched down in the area near Hillsdale in Monroe County and moved north into Greenbrier County. The funnel continued for approximately a mile in Greenbrier County and was reported to be approximately 150 yards in diameter. The event did not result in any injuries or fatalities, but did cause a reported $250,000 in property damage (NCDC, 2016).

April 27th, 2011

North of Richwood, in Nicholas County, a brief tornado skipped along the mountainside and the Cranberry River Valley on April 27th, 2011. This was along Forest Road 76. Trees were blown down as well as snapped off above the ground. Maximum wind gusts near 110 mph were estimated by the survey team. One camper and a few trucks were damaged by fallen trees (NCDC, 2016).

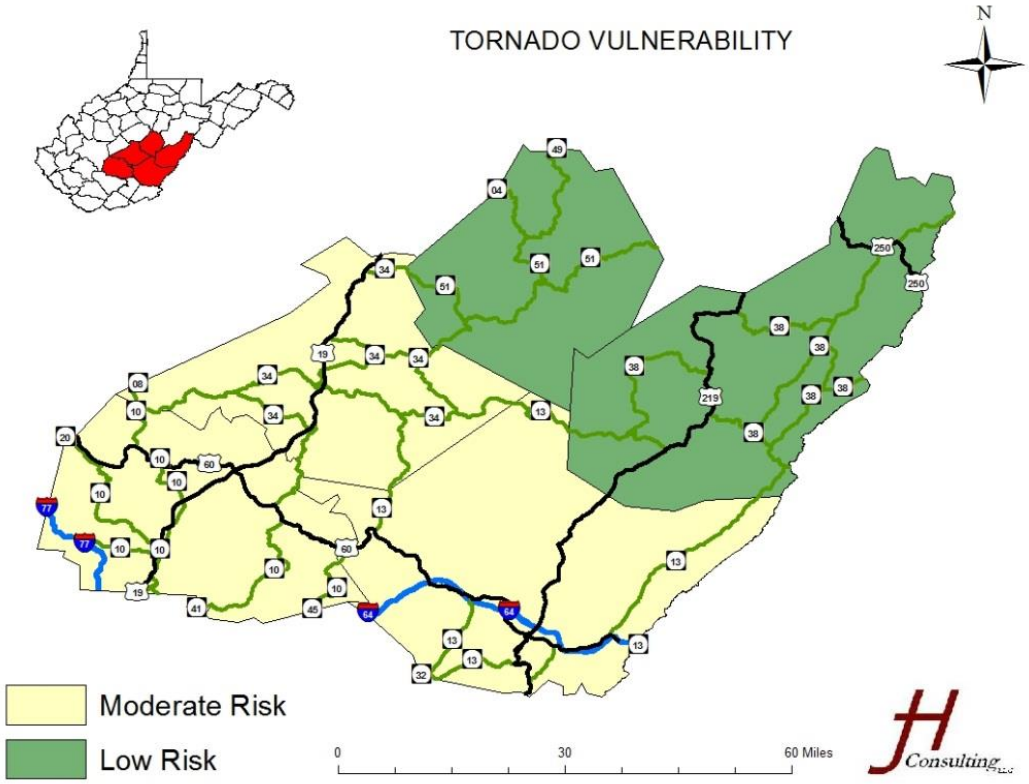
Vulnerable Structures

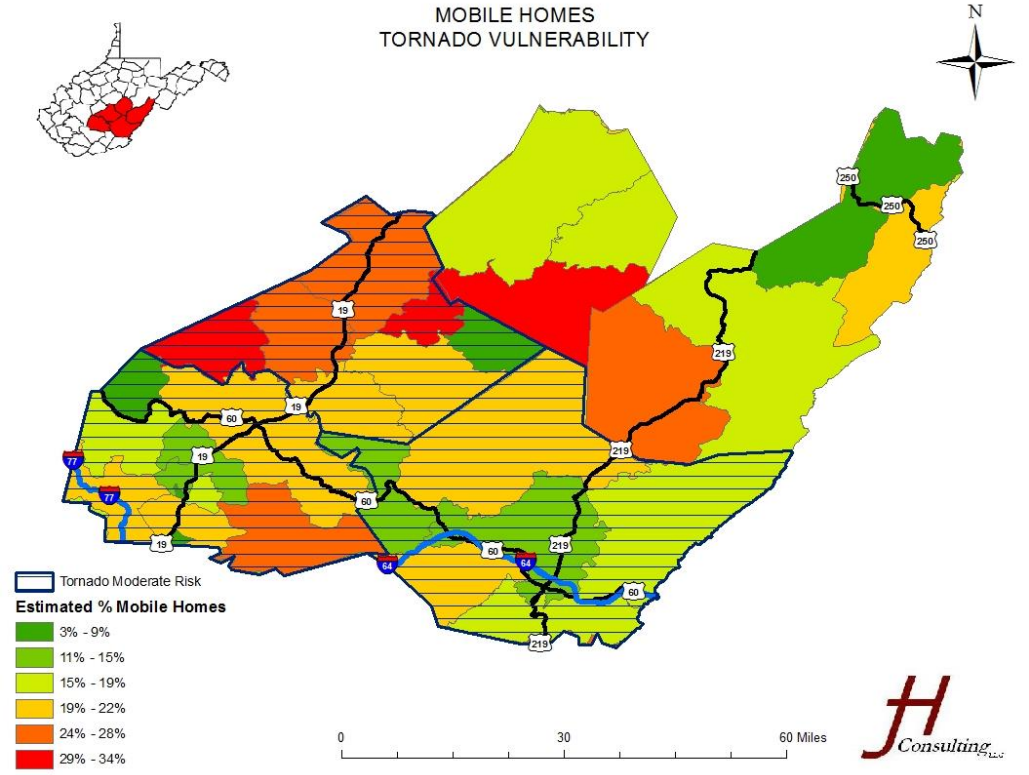
Due to the difficulty in predicting future tornado paths planning for future events is mostly based on historical trends and identifying areas that are particularly at risk. Structures in Fayette, Greenbrier and Nicolas Counties would be most at risk, while structures in Pocahontas and Webster have a much reduced risk. According to Haddow, Bullock, & Coppola, Tornadoes follow a path of least resistance, leaving those who live in valleys with the greatest exposure (2014, pg.43). Generally speaking, structures that are built of lightweight materials such as newer homes and mobile homes have the highest risk since even a low scale tornado can cause significant damage to these structures.

Loss Estimate

Loss estimates for tornado events can be obtained through the historical research. On average, there are 0.22 tornado events in parts of Region 4 every year (12 events /54 years.) Based on this, there will be one tornado event every 4-5 years. On average, tornado events cause $507,166 in property damage, so this amount of damage can be estimated to occur every 4-5 years. The worst case scenario, based on historical research, is an event that killed one, injured eight and caused $5 million in property damage that occurred on April 27th, 1974 in Fayette and Greenbrier Counties.

Risk Maps


TORNADO VULNERABILITY
N
Moderate Risk
Low Risk
0
30
60 Miles
Consulting


MOBILE HOMES
TORNADO VULNERABILITY
N
Tornado Moderate Risk
Estimated % Mobile Homes
3% - 9%
11% - 15%
15% - 19%
19% - 22%
24% - 28%
29% - 34%
0
30
60 Miles
Consulting

WILDFIRE

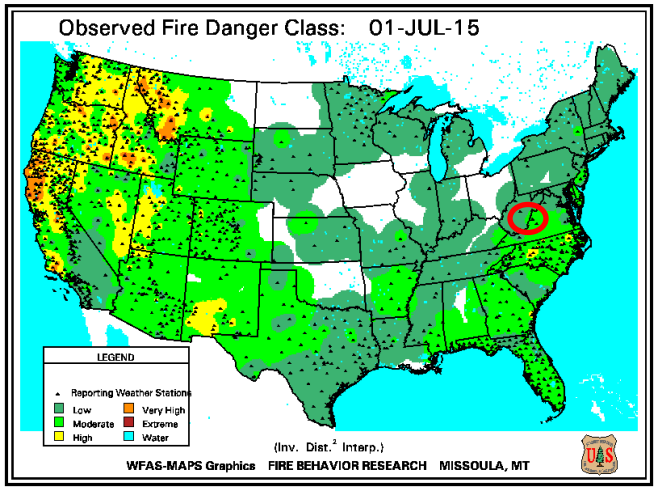
"Wildfires are an annual and increasing hazard due to the air pollution, risk to firefighters, environmental effects, and property damage they cause" (Haddow, Bullock, & Coppola, 2014, pg.45.)

Research Sources:

- NOAA National Climatic Data Center
- West Virginia Department of Forestry.

Period of Occurrence	Primarily in Summer
Number of Events (1999-2015)	4
Probability of Event	0.25
Warning time	Minimal
Potential Impacts	Impacts the environment as well as potentially impacting human life, health and public safety.
Cause Injury or Death	Injury and risk of death
Potential Facility Shutdown	Days to weeks or more

Hazard Effects



Wildfires often begin as a result of human activity, whether it is accidental in the case of a camp fire not properly extinguished or purposeful arson. Since the National Interagency Fire Center formed, the number of fire each year has fallen while the amount of acreage burnt has increased (Haddow, Bullock, & Coppola, 2014). In 2015, the West Virginia Division of Forestry reported that there were a total of 678 wildfires that burnt over 17,000 acres.. The Wildland Fire Assessment System (WFAS) generates risk maps for wildfires on a daily basis. The map to the left was generated on July 1st, 2015 which is typically in the middle of wildfire season. At that time, the WFAS had all of Region 4 listed as a low fire danger class

except for a small section along the Virginia border which was listed as being in the moderate danger class.

A growing problem related to wildfire is human expansion into areas of previously untouched wildlands, known as the wildland-urban interface. Fires in these areas can quickly threaten homes, leading to increased property losses and increased threat of injuries and fatalities. Wildfire can damage and destroy local infrastructure and utilities, as well as local critical facilities if not controlled in a timely manner. While some natural wildfires are environmentally beneficial, large uncontrolled fires can lead to loss of wildlife habitats, soil erosion and degraded water quality.

Hazard Profile

The National Climatic Data Center (NCDC) tracks wildfire events across the country and has four wild fires listed for Region 4 between 1999 and 2015. Three of these fires occurred in Fayette County and one occurred in Nicholas County. No deaths, injuries, or property damage were noted for any of the four fires. However, the NCDC is only listing what it considers to be significant events. Small brush and undergrowth fires most likely happen with much more frequency throughout Region 4. These fires, those smaller, still require time and effort by local firefighters, and possibly by the Division of Forestry, depending on the size and ease of access. According to local fire department representatives, these fires are typically extinguished before they become a major threat and are typically located in rural areas, rather than in the urban-wildland interface.

The West Virginia Division of Forestry relates the 99% of all wildfires in West Virginia are caused by humans. The leading cause of wildfires is debris burning followed by the purposeful setting of wildfires. While there are significant year to year differences, the Division of Forestry reported that in the last three years an average of 12,617 acres burnt in West Virginia.

Historical Occurrences

There have not been wildfires in West Virginia, or Region 4, which reach the scale of those seen in the western reaches of the country. While smaller brush and wildland fires may occur regular, they rarely have a large impact on the region.

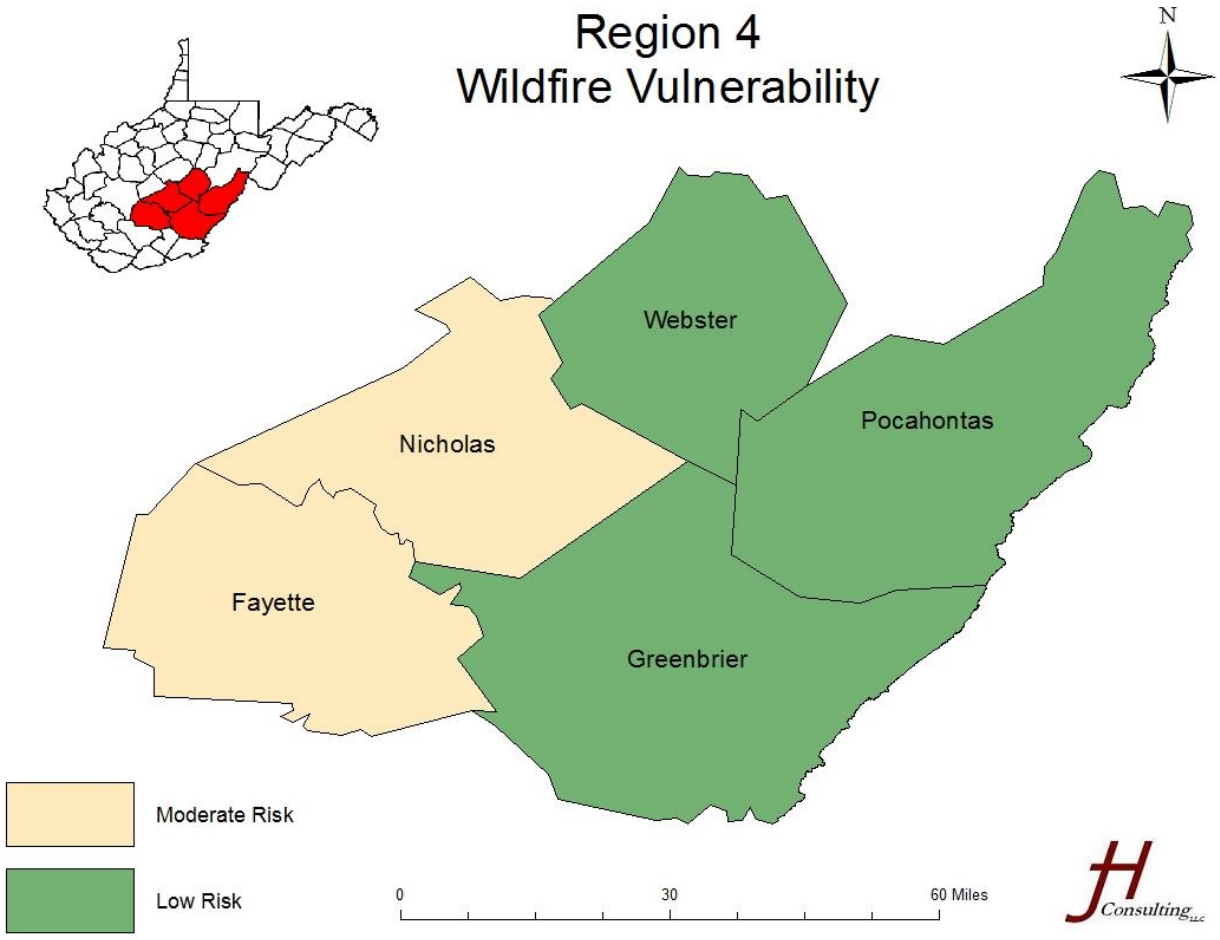
Vulnerable Structures

Large numbers of structures in Region 4 are considered to be in the "wildland – urban interface." These structures, surrounded by undeveloped fields and forested areas, are most at risk from wildfire activity.

Loss Estimates

There has been no property damage reported as a result of a wildfire to the NCDC database since 1999. Without historical damage figures, calculating a numerical loss estimate for structure or crops is not feasible.

Risk Map



WIND EVENTS (HIGH WIND & STRONG WIND)

"Sustained non-convective winds of 35 knots (40 mph) or greater lasting for 1 hour or longer, or winds (sustained or gusts) of 50 knots (58 mph) for any duration, on a widespread or localized basis" (National Weather Service Instruction 10-1605.)

Research Sources:

- NOAA National Climatic Data Center

Period of Occurrence	At any time, but primarily between March and August
Number of Events (1997-2015)	71
Probability of Event	3.9
Warning time	Minutes to hours
Potential Impacts	Utility damage and outages, infrastructure damage, structural damage. Critical facilities may be damaged or destroyed.
Cause Injury or Death	Injury and risk of deaths
Potential Facility Shutdown	Days to weeks or greater

Hazard Effects

A wind event can be associated with other hazards, though wind associated with thunderstorms is a separate hazard types. Wind events will have little or no rain associated with them and may last considerably longer than other wind events like thunderstorm wind and tornadoes. Wind events can result in a number of impacts, including blowing tree limbs and trees onto structures, roadways, and power lines. The National Climatic Data Center (NCDC) records two types of stand-alone wind events: high wind events and strong wind events. While both types of events have wind speed requirements, strong wind events result in fatalities, injuries or damage (National Weather Service Instruction 10-1605.)

Hazard Profile

The table on the right shows the number of high wind and strong wind events in Region 4 between 1997 and 2015. Of wind events that are separate from other hazards, the large majority are categorized as high wind events, meaning that they did not necessarily result in injuries, deaths or damage. The next table, shown below, breaks down the combined high and strong wind events by the county the event occurred in. Each county in the region sees a fairly equal number of these events over the 18 year time span.

Type	Total
High Wind	61
Strong Wind	10
Total	71

County	Total	Property Loss ($)
Fayette	16	$ 66,000.00
Greenbrier	15	$ 159,900.00
Nicholas	14	$ 63,000.00
Pocahontas	12	$ 45,000.00
Webster	14	$ 62,000.00
Total	71	$ 395,900.00

Vulnerable Populations

There are populations within Region 4 that may have more difficulty dealing with the secondary effects of winds, power loss being chief among these. The elderly and institutionalized are particularly susceptible to power loss. Many of the elderly, and those who are in nursing homes / long term care facilities, rely on supplemental oxygen. This is typically supplied by condensers, with a reserve of bottled oxygen for travelling and for emergencies. This reserve supply will most likely only last a few days at the most. Long term outages, like those faced in the Derecho of 2012, can easily surpass these oxygen reserves, placing the elderly and those in long term care facilities without generators at significant risk.

The map below shows the winds risk map overlaid onto the elderly social vulnerability layer, to identify census tracts with the highest percentages of elderly that will be the highest risk population in this scenario. The map identifies three census tracts in the highest category: two in Greenbrier County and one in Nicholas County. In these tracts, over 22% of the population is over the age of 65.

Historical Occurrences

December 9th, 2009

After widespread rains across the area, winds increased during the afternoon of the 9th, gusting between 45 mph and 60 mph regularly. All five counties in Region 4 were affected by this wind event, with falling trees causing damages to buildings and causing

power outages. In total, the five counties of the region saw $75,000 in property damages (NCDC, 2016).

December 25th, 2009

A strong south and southeast wind flow led to damage in Fayette, Nicholas and Webster counties on Christmas Day, 2009. Peak gusts reached nearly 60 mph, with sustained gusts in the 45-55 mph range. A section of roofing was blown off a building in Cowen, and multiple trees and branches fell on power lines in the area. Total damage in Region 4 counties was $65,000 ($10,000 in Fayette, $30,000 in Webster, and $25,000 in Nicholas) (NCDC, 2016).

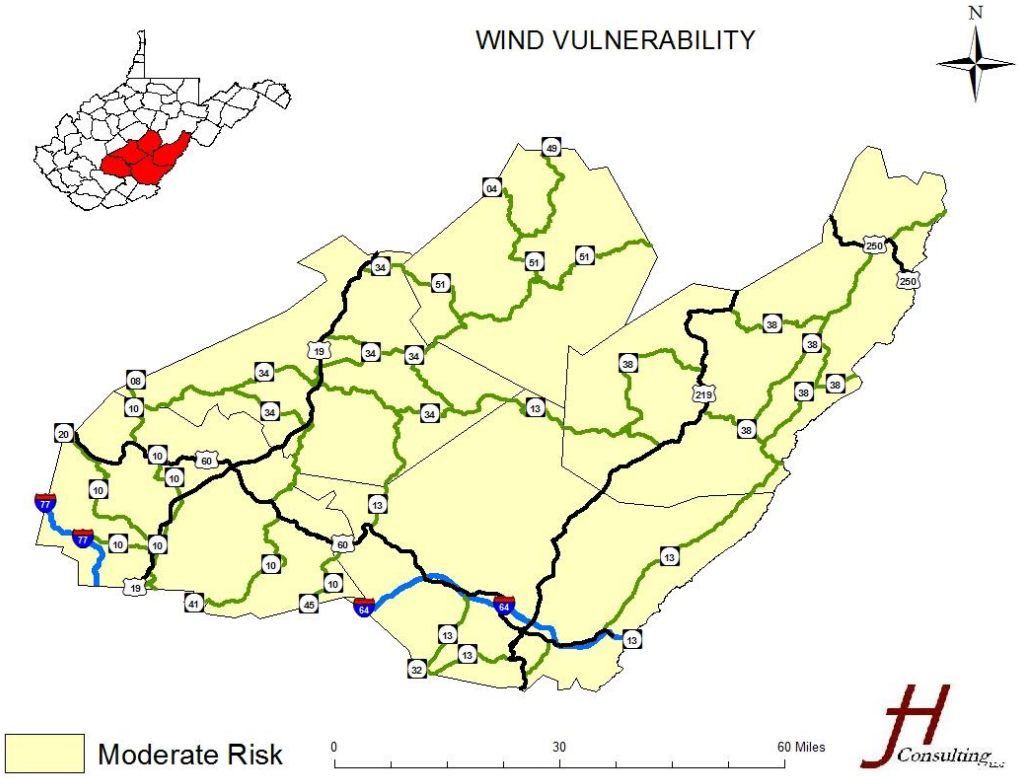
October 30th, 2012

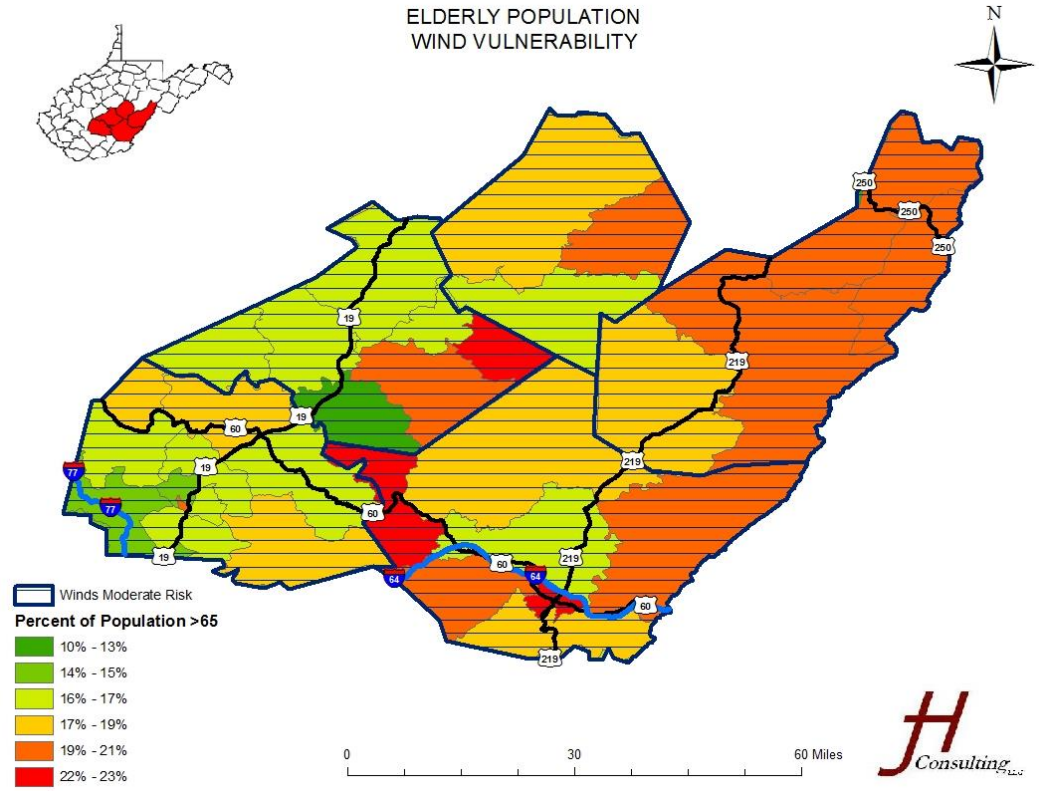
Hurricane/"Super Storm" Sandy moved along and through the mid-Atlantic region, bringing heavy snow and high winds to southeastern West Virginia on October 30th, 2012. High winds in Greenbrier County caused multiple trees to fall in the Rainelle and Lewisburg areas, causing an estimated $50,000 in property damage (NCDC, 2016).

Loss Estimates

Loss estimates for wind events can be obtained through the historical research. On average, there are 3.94 wind events in Region 4 every year (71 events / 18 years.) These storms will cause, on average, and estimated $5,576 in property damage per an event. Cumulatively, wind events will cause an estimated $21,969 in property damage every year. The worst case scenario, also taken from historical research, is $50,000 in property damage. This has occurred twice in Greenbrier County, with one event occurring on April 15th, 2007 and the other on October 30th, 2012.

Risk Map


WIND VULNERABILITY
N
Moderate Risk
0
30
60 Miles
Consulting


ELDERLY POPULATION
WIND VULNERABILITY
N
Winds Moderate Risk
Percent of Population >65
10% - 13%
14% - 15%
16% - 17%
17% - 19%
19% - 21%
22% - 23%
0
30
60 Miles
Consulting

WINTER STORMS

"Occur when extremely cold atmospheric conditions coincide with high airborne moisture content, resulting in rapid and heavy precipitation of snow and/or ice" (Haddow, Bullock, & Coppola, 2014, pg.50.)

Research Sources:

- NOAA National Climatic Data Center

Period of Occurrence	Winter
Number of Events (1996-2015)	528[xvi]
Probability of Event	27.8
Warning time	Days
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.
Cause Injury or Death	Injury, potential for death
Potential Facility Shutdown	Days

Hazard Effects

The National Climatic Data Center (NCDC) compiles data on a number of different types of winter weather events. Included in this hazard profile are blizzards, ice storms, heavy snow, winter storms and winter weather. Winter storms make it extremely difficult and hazardous to travel, and can lead to wide spread utility outages.

The NCDC defines these events as follows:

- **Blizzard:** A winter storm which produces the following conditions for 3 hours or longer: (1) sustained winds or frequent gusts 30 knots (35 mph) or greater, and (2) falling and/or blowing snow reducing visibility frequently to less than 1/4 mile, on a widespread or localized basis.

- **Ice Storm:** Ice accretion meeting or exceeding locally/regionally defined warning criteria (typical value is 1/4 or 1/2 inch or more), on a widespread or localized basis.
- **Heavy Snow:** Snow accumulation meeting or exceeding locally/regionally defined 12 and/or 24 hour warning criteria, on a widespread or localized basis. This could mean such values as 4, 6, or 8 inches or more in 12 hours or less; or 6, 8, or 10 inches in 24 hours or less.
- **Winter Storms:** A winter weather event which has more than one significant hazard (i.e., heavy snow and blowing snow; snow and ice; snow and sleet; sleet and ice; or snow, sleet and ice) and meets or exceeds locally/regionally defined 12 and/or 24 hour warning criteria for at least one of the precipitation elements, on a widespread or localized basis.
- **Winter Weather:** A winter precipitation event that causes a death, injury, or a significant impact to commerce or transportation but does not meet locally/regionally defined warning criteria. A Winter Weather event could result from one or more winter precipitation types (snow, or blowing/drifting snow, or freezing rain/drizzle), on a widespread or localized basis (National Weather Service Instruction 10-1605).

Hazard Profile

Winter weather events are the most frequently occurring hazard in all of the counties within Region 4, as illustrated in the table to the right. As the table shows, of the five types of events, heavy snow is the most common while blizzards are a rare event.

Type	Total
Blizzard	5
Ice Storm	24
Heavy Snow	307
Winter Storm	54
Winter Weather	138
Total	528

The table below breaks the total storms down by county while showing the amount of property damage each county has sustained from winter weather. Winter weather events are the second most costly hazard type that occurs within Region 4. As the table shows, the total property loss reported to the NCDC between 1996 and 2015 is nearly $24 million. Winter storms can encompass the majority of the region, or can be limited to any given area within the region. Theoretically every structure and type of infrastructure in the region is at risk. Due to their frequency, many of these weather events are considered part of everyday life in the winter time and are not considered dangerous.

County	Total	Property Loss ($)
Fayette	81	$ 18,877,000.00
Greenbrier	89	$ 1,560,000.00
Nicholas	103	$ 550,000.00
Pocahontas	143	$ 2,797,000.00
Webster	112	$ 40,000.00
Total	528	$ 23,824,000.00

While the residents of Region 4 are most probably fairly well adapted to living with this hazard, complacency can be dangerous when storms that are larger and more powerful than the norm come through the area.

Vulnerable Populations

There are populations within Region 4 that may have more difficulty dealing with the secondary effects of winter weather events, power loss being chief among these. The elderly and institutionalized are particularly susceptible to power loss. Many of the elderly, and those who are in nursing homes / long term care facilities, rely on supplemental oxygen. This is typically supplied by condensers, with a reserve of bottled oxygen for travelling and for emergencies. This reserve supply will most likely only last a few days at the most. Long term outages can easily surpass these oxygen reserves, placing the elderly and those in long term care facilities without generators at significant risk.

The map below shows the winter weather risk map overlaid onto the elderly social vulnerability layer, to identify census tracts with the highest percentages of elderly that will be the highest risk population in this scenario. Two of the highest elderly percentage census tracts fall partially in the high risk area of the map: most of a tract in Nicholas County and a small portion of a tract in Greenbrier County. People over the age of 65 represent over 22% of the population in these census tracts. While the map specifically identifies the high risk areas, the remainder of Region 4 is still at a moderate risk form winter storms.

Historical Occurrences

October 29th-31st, 2012

The remnants of Hurricane Sandy, dubbed “Superstorm Sandy,” impacted the mid-Atlantic portion of the eastern seaboard in late October, 2012. In West Virginia the storm manifested as a fall blizzard, dropping large amounts of snow across the state. The NCDC event details state that areas of Nicholas, Pocahontas and Webster counties had snow accumulations upwards of 40 inches. Over $14 Million in property damages were reported in Region 4 (NCDC, 2016).

February 21st, 2015

In Pocahontas County, twenty four inches of snow fell in the Snowshoe area and other parts of the county, eventually causing a reported $50k in property damage (NCDC, 2016). The Pocahontas Times detailed that the "atrocious snowstorm," which occurred on February 21st, 2015, cost the Town of Marlinton more than $25,000 in snow removal costs (Pocahontas Times, 2015).

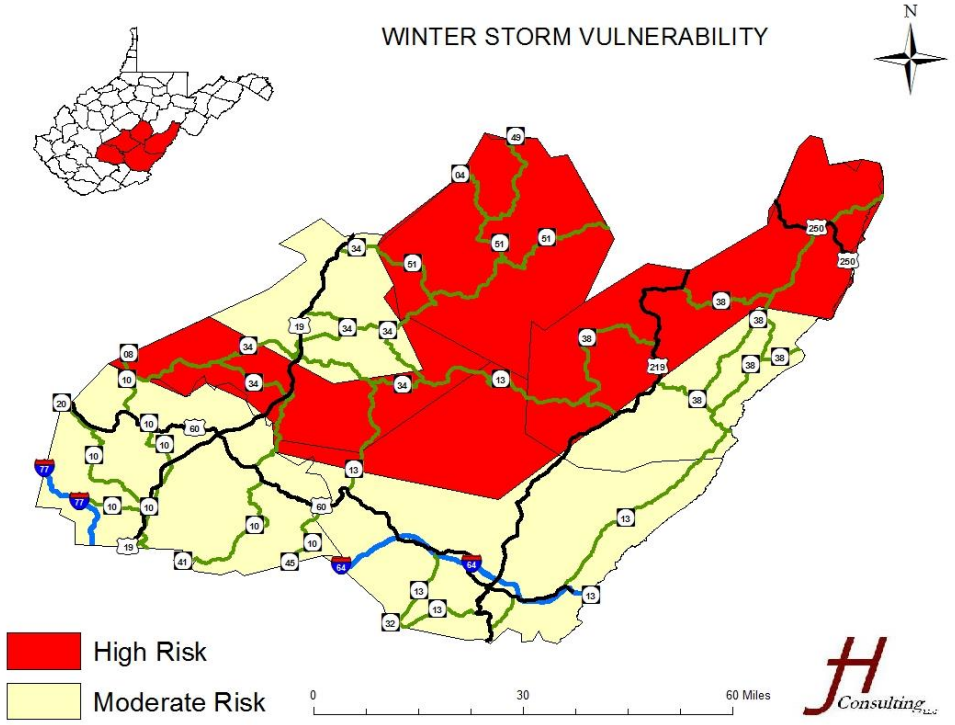
January 22nd-24th, 2016

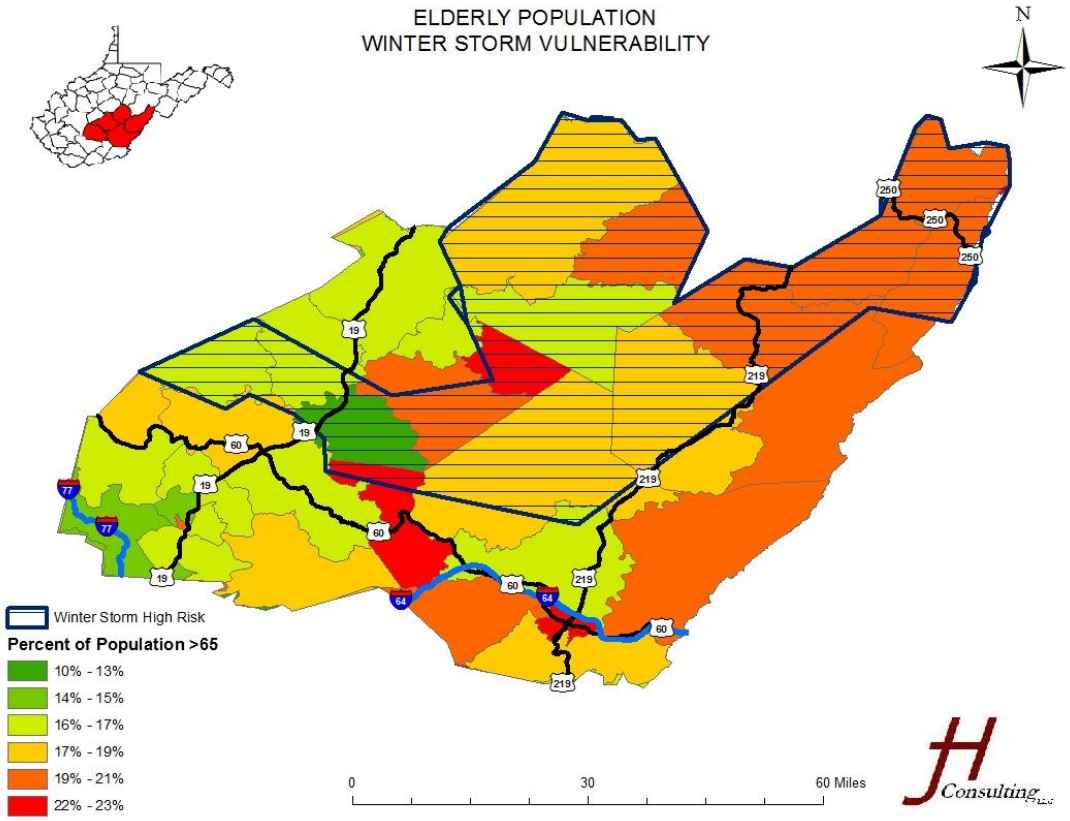
Over the weekend of January 22nd to the 24th, 2016, Winter Storm "Jonas" impacted the Region 4 area along with the rest of West Virginia and neighboring states. The Fayette Tribune reported ten inches of snow across Fayette and Nicholas counties on the first day of the storm and a total of up to 30 inches over the entirety of the storm (Fayette Tribune, 2016). It was also reported on January 22nd that Mon Power had 287 customers without power in Greenbrier County (Fayette Tribune, 2016).

Loss Estimates

Loss estimates for winter weather events can be obtained through the historical research. On average, there are 2 7.79 winter weather events in Region 4 every year (528 events / 19 years.) These storms will cause, on average, and estimated $45,121 in property damage per an event. Cumulatively, winter storms will cause an estimated $1,253,918 in property damage every year.

Risk Maps


WINTER STORM VULNERABILITY
N
High Risk
Moderate Risk
0
30
60 Miles
Consulting


ELDERLY POPULATION
WINTER STORM VULNERABILITY
N
Winter Storm High Risk
Percent of Population >65
10% - 13%
14% - 15%
16% - 17%
17% - 19%
19% - 21%
22% - 23%
0
30
60 Miles
Consulting

[i] "Water" means any liquid, including any solids or other matter which may be contained therein, which is or may be impounded by a dam (WVDEP, 2009.)

[ii] Equivalent to 4,917,420 gallons

[iii] Equivalent to 16,391,400 gallons

[iv] Flooding is not contained by county lines; one major event can cause flooding in multiple areas. Some events may be counted multiple times due to the NCDC compiling event data by county rather than region. Damages are calculated by the NCDC at the county level.

[v] John Brown's 2002 paper is focused on the intersect between flooded areas of Fayette county and timbering.

[vi] Refers to all unincorporated areas of the county.

[vii] This was reached by removing the $47 Million dollar flash flood event in Fayette County, which is a significant outlier.

[viii] This was reached by removing the $47 Million dollar flash flood event in Fayette County, which is a significant outlier.

[ix] No Special Flood Hazard Area.

[x] HLDI data was created by taking claim data and cross referencing claims with the NCDC's storm events database.

[xi] Not located within Region 4, but located near the Fayette County border. The event had regulatory and safety impacts regionally.

[xii] Not located within Region 4, but this incident has led to significant regulatory changes in source water protection and changes in regulations regarding above ground tanks.

[xiii] Definitions from Haddow, Bullock, & Coppola, 2014, pg.46-47

[xiv] Notification of a storm with the potential for lighting may occur minutes to hours in advance, but there is no warning time for an individual lightning strike.

[xv] The National Weather Service can warn of thunderstorms with the potential to spawn a tornado hours in advance, but warning time of the actual formation of a tornado is much shorter.

[xvi] Winter storms are not typically limited to one county, but the NCDC tracks events by county, with the property losses being listed by county rather than by storm. Some storms may be counted multiples times.

2.3 INVENTORY ASSETS

§201.6(c)(2)(ii)	[The risk assessment shall include a] description of the jurisdiction's vulnerability of the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.
§201.6(c)(2)(ii)(A)	The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

This risk assessment identifies potentially-vulnerable community assets such as critical facilities, critical infrastructure, historical properties, commercial/industrial facilities, etc. *Assets* contribute directly to the quality of life in the community 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).

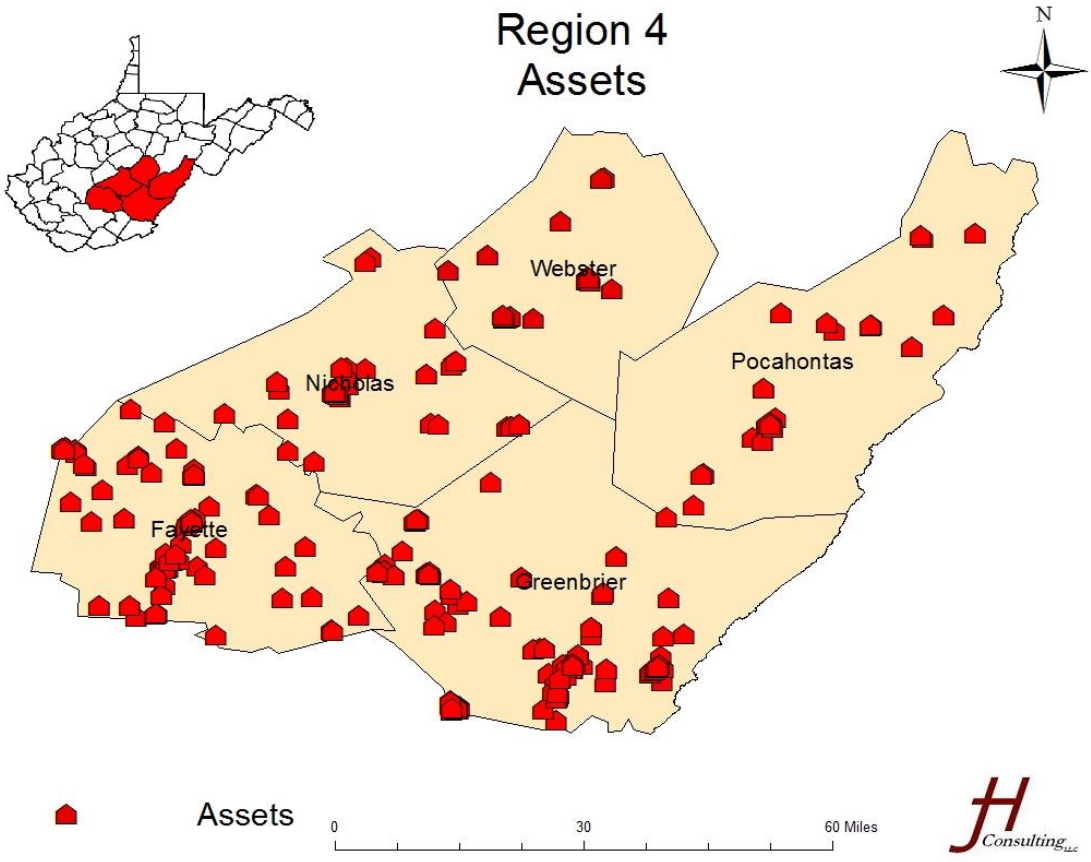
2.3.1 Methodology

Inventorying assets first involves determining what in the community can be affected by a hazard event. The hazard profiles contained in Section 2.2 above contain generalized loss estimates that, in some cases identify the types of facilities that could be impacted by the hazards considered in this plan. Additionally, the core planning committee used its meetings during the update process to significantly revise the original asset list that was included in this plan. In the following lists, assets are grouped into the following categories.

- **Critical Facilities:** Governmental facilities, water/wastewater facilities, emergency services facilities, medical facilities (hospitals/clinics), and 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.

2.3.2 Asset Inventory

The following tables list assets on a community-by-community basis. Each asset table denotes the name, address, and type of asset for each facility listed as well as a determination of vulnerability for each asset. Vulnerability is listed as either low (L), moderate/medium (M), or high (H). Vulnerability was assessed by mapping the assets and overlaying hazard areas. A map of the various assets in Region 4 is



seen below.

Fayette County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Adventures On The Gorge	1 Ames Heights Road, Lansing, Wv 25862	Economic	L	L	L	L	L	L	L	L	M	M	M	M	M
Altamont Hotel	110 Fayette Ave, Fayetteville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Ansted Center	P.O. Drawer 400, Ansted, Wv, 25812	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Ansted Certified Volunteer Fire Department	104 Page Street, Ansted, Wv, 25812	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Ansted Elementary School	118 Church Street, Ansted, Wv 25812	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Ansted Middle School	118 Church Street, Ansted, Wv 25812	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Ansted Police Department	104 Cemetery Street, Ansted, Wv, 25812	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Ansted Town Hall	104 Cemetary Street, Ansted, Wv 25812	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Armstrong Creek Volunteer Fire Department	County Road 61/24, Powellton, Wv, 25161	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Bank Of Glen Jean	Main St., Glen Jean, Wv	Historical	L	L	L	H	L	L	L	L	M	M	M	M	M
Boomer Christian School	1 Church Street, Boomer, Wv 25031	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Boomer Volunteer Fire Department	188 Park Road, Boomer, Wv, 25031	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Bridges	Region-Wide	Special	L	L	L	H	L	M	L	M	M	M	M	M	H
Collins Middle School	601 Jones Avenue, Oak Hill, Wv 25901	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Contentment	Along U.S. 60, Ansted, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Danese Christian School	18459 Stanaford Road, Danese, Wv 25831	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Danese Volunteer Fire Department	County Road 31, Danese, Wv, 25831	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Divide Elementary School	21 Divide Road, Lookout, Wv 25868	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Fayette Continuous Care Center	100 Hresan Boulevard, Fayetteville, Wv, 25840	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Fayette County Courthouse	100 Court Street, Fayetteville, Wv 25840	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M

Fayette County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Fayette County Courthouse	Court St. Between Wiseman And Maple Aves., Fayetteville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Fayette County Emergency Operations Center	200 West Maple Avenue, Fayeteville, Wv 25840	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Fayette County Sheriffs Department	100 North Court Street, Fayetteville, Wv, 25840	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Fayette County Sheriffs Office - Smithers Detachment	72 Michigan Avenue, Smithers, Wv 25186	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Fayette Institute Of Technology	300 W Oyler Avenue, Oak Hill, Wv 25901	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Fayetteville Elementary School	200 Wiseman Avenue, Fayetteville, Wv 25840	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Fayetteville Fire Department	150 Lively Street, Fayetteville, Wv, 25840	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Fayetteville High School	515 W Maple Avenue, Fayetteville, Wv 25840	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Fayetteville Police Department	125 North Court Street, Fayetteville, Wv, 25840	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Fayetteville Town Hall	125 N Court Street, Fayetteville, Wv 25840	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Gatewood Elementary School	5094 Gatewood Road, Fayetteville, Wv 25840	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Gauley Bridge Elementary School	140 Walnut Street, Gauley Bridge, Wv 25085	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Gauley Bridge Police Department	95 Main Street, Gauley Bridge, Wv, 25085	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Gauley Bridge Railroad Station	Off Wv 16/39, Gauley Bridge, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Gauley Bridge Town Hall	278 Railroad Street, Gauley Bridge, Wv 25085	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Gauley Bridge Volunteer Fire Department	314 Main Street, Gauley Bridge, Wv, 25085	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Gauley River Volunteer Fire Department	River Front Road, Swiss, Wv, 26690	Critical	L	L	L	H	L	L	L	L	M	M	M	M	M
General Ambulance Service Incorporated - Main Street Substation	1307 East Main Street, Oak Hill, Wv, 25901	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
General Ambulance Service Incorporated Station 1	7002 Legend Highway, Oak Hill, Wv, 25901	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
General Ambulance Service Incorporated Station 5	1300 Beards Fork Road, Robson, Wv, 25173	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M

Fayette County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
General Ambulance Service Incorporated Station 6	521 Highland Avenue, Oak Hill, Wv, 25901	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Glen Ferris Inn	Us 60 Overlooking Kanawha Falls, Glen Ferris, Wv	Historical	L	L	L	H	L	L	L	L	M	M	M	M	M
Global Contact Services	101 Martin Dr. Mount Hope	Economic	L	L	L	L	L	L	L	L	M	M	M	M	M
Halfway House	Off Old U.S. 60, Ansted, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Hidden Valley Health Care	422 - 23rd Street, Oak Hill, Wv, 25901	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Hilltop Center	P.O. Box 125, Hilltop, Wv, 25855	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Hughart, Dr. John, House	Off Wv 41, Landisburg, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan Care Ambulance Service Incorporated - Maintenance Garage	106 Summerlee Avenue, Oak Hill, Wv, 25901	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan-Care Ambulance Service Incorporated - Ansted	104 Page Street, Ansted, Wv, 25812	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan-Care Ambulance Service Incorporated - Fayetteville	316 Court Street, Fayetteville, Wv, 25840	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan-Care Ambulance Service Incorporated - Gauley Bridge	322 Main Street, Gauley Bridge, Wv, 25085	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan-Care Ambulance Service Incorporated - Montgomery	134 4th Avenue, Montgomery, Wv, 25136	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan-Care Ambulance Service Incorporated - Mount Hope	College Avenue, Mount Hope, Wv, 25880	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan-Care Ambulance Service Incorporated - Oak Hill	Summerlee Avenue, Oak Hill, Wv, 25901	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan-Care Ambulance Service Incorporated - West End	408 Virginia Street, Oak Hill, Wv, 25901	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jean Spadaro Juvenile Center	106 Martin Drive, Mount Hope, Wv 25880	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Kanawha Falls Psd Water Plant	362 Main Street, Gauley Bridge, Wv 25085	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Kingston Mining Inc	600 Resource Dr. Scarbro Fayette Co.	Economic	L	L	L	L	L	L	L	L	M	M	M	M	M
Loup Creek Volunteer Fire Department	State Highway 61, Page, Wv, 25152	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Loup Creek Volunteer Fire Department - Robson	State Highway 61, Montgomery, Wv, 25136	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M

Fayette County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Main Building	West Virginia Institute Of Technology Campus, Montgomery, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Meadow Bridge Elementary School	2725 Main Street, Meadow Bridge, Wv 25976	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Meadow Bridge High School	870 Main Street, Meadow Bridge, Wv 25976	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Meadow Bridge Volunteer Fire Department	State Highway 20, Meadow Bridge, Wv, 25976	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Midland Trail High School	26719 Midland Trail, Hico, Wv 25854	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Montgomery City Hall	706 3rd Avenue, Montgomery, Wv, 25136	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Montgomery General Elderly Care	P.O. Box 1010, Montgomery, Wv, 25136	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Montgomery General Hospital	401 6th Avenue, Montgomery, Wv, 25136	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Montgomery General Hospital, D/P	Washington St. & 6th Ave., Montgomery, Wv, 25136	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Montgomery Police Department	706 3rd Avenue, Montgomery, Wv, 25136	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Mount Hope City Hall	609 Main Street, Mount Hope, Wv 25880	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Mount Hope Elementary School	408 Lincoln Street, Mt. Hope, Wv 25880	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Mount Hope Police Department	609 Main Street, Mount Hope, Wv, 25880	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Mount Hope Volunteer Fire Department	428 Main Street, Mount Hope, Wv, 25880	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Mount Olive Correctional	1 Mountainside Way, Mount Olive, Wv	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Mountain View Christian School	2 Mountain View Road, Hilltop, Wv 25855	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
New River Elementary School	262 Oyler Avenue, Oak Hill, Wv 25901	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
New River Gorge National River Ranger Station	104 Main Street, Glen Jean, Wv, 25846	Critical	L	L	L	H	L	L	L	M	M	M	M	M	M
Nuttall Volunteer Fire Department	United States Highway 60, Hico, Wv, 25854	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Oak Hill City Hall	100 Kelly Avenue, Oak Hill, Wv 25901	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M

Fayette County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Oak Hill High School	350 Oyler Avenue, Oak Hill, Wv 25901	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Oak Hill Police Department	100 Kelly Avenue, Oak Hill, Wv, 25901	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Oak Hill Railroad Depot	Jct. Of Virginia Ave. And Central Ave., Oak Hill, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Oak Hill Volunteer Fire Department	99 Virginia Street, Oak Hill, Wv, 25901	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Page-Vawter House	Rt. Box 20, Ansted, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Pax Town Hall	99 Center Street, Pax, Wv 25904	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Pax Volunteer Fire Department	122 Center Street, Pax, Wv, 25904	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Plateau Medical Center	430 Main Street, Oak Hill, Wv, 25901	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Plateau Medical Center, D/P	430 Main Street, Oak Hill, Wv, 25901	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Prince Brothers General Store--Berry Store	Wv 41, Prince, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Railways	Region-Wide	Special	L	L	L	H	L	M	L	M	M	M	M	M	H
Residential	Region-Wide	Special	L	L	L	H	L	L	L	L	M	M	M	M	H
River Expeditions	900 Broadway Avenue, Oak Hill, Wv 25901	Economic	L	L	L	L	L	L	L	L	M	M	M	M	M
Roads	Region-Wide	Special	L	L	L	H	L	M	L	M	M	M	M	M	H
Rosedale Elementary School	3950 Summerlee Road, Oak Hill, Wv 25901	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Saints Peter & Paul Elementary School	123 Elmore Street, Oak Hill, Wv 25901	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Smithers City Hall	518 Michigan Avenue, Smithers, Wv 25186	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Smithers Police Department	175 Michigan Avenue, Smithers, Wv, 25186	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Smithers Volunteer Fire Department	175 Michigan Avenue, Smithers, Wv, 25186	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Thurmond Town Hall	Thurmond	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M

Fayette County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Tyree Stone Tavern	E Of Clifftop Off U.S. 19 On Sr 10, Clifftop, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
United States Department Of Interior - National Park Service	104 Main Street, Glen Jean, Wv, 25846	Critical	L	L	L	H	L	L	L	M	M	M	M	M	M
Valley Elementary School	75 Michigan Avenue, Smithers, Wv 25186	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Valley High School	1 Greyhound Lane, Smithers, Wv 25186	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Wal-Mart (Fayetteville)	100 Fayette Town Ctr, Fayetteville Fayette Co.	Economic	L	L	L	L	L	L	L	L	M	M	M	M	M
West Virginia Division Of Forestry - Fayette County Field Office	102 East Maple Avenue, Fayetteville, Wv, 25840	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
West Virginia University Institute Of Technology Campus Police	405 Fayette Pike, Montgomery, Wv, 25136	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Whipple Company Store	Jct. Of Co. Rds. 15 And 21/20, Whipple, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
WVA Manufacturing	3814 Midland Trail, Boomer, Wv 25031	Economic	L	L	L	L	L	L	L	L	M	M	M	M	M
WVSP Troop 6 - Gauley Bridge Detachment	10365 Midland Trail, Gauley Bridge, Wv 25085	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
WVSP Troop 6 - Oak Hill Detachment	1853 Main Street East, Oak Hill, Wv, 25901	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
WVU Tech	405 Fayette Pike Montgomery, WV	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
ABB,Inc	3567 Jefferson St. N, Lewisburg, WV 24901	Economic	L	L	L	L	L	L	M	L	M	M	L	M	M
Alderson Bridge	219 S. Monroe St. Alderson, WV 24910	Historic	L	L	L	M	L	L	L	L	M	M	L	M	M
Alderson Community Center	317 Chestnut Ave E, Alderson, WV 24910	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
Alderson ES	305 Elmwood AVE, Alderson, WV 24910	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M
Alderson Senior Center	336 Alderson Cemetery Road, Alderson, WV 24910	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M
Alderson Sewer Plant	180 Glen Ray Rd, Alderson, WV 24910	Critical	L	L	L	M	L	L	L	M	M	M	L	M	M
Alderson Town Hall & Police Station	311 S Monroe St. Alderson, WV 24910	Critical	L	L	L	L	L	L	L	M	M	M	L	M	M
Alderson VFD/EMS	39 Railroad Ave, Alderson. WV 24910	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
Alderson Water Plant	164 Johnson St. Alderson, WV 24910	Critical	L	L	L	M	L	L	L	M	M	M	L	M	M
Alexander McVeight Miller House	356 E Hemlock Ave. Alderson, WV 24910	Historic	L	L	L	L	L	L	L	L	M	M	L	M	M
Alexander W. Arbuckle House	861 Arbuckle Lane, Maxwelton, WV 24957	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
American Foam Technologies	473 McLaughlin Ln, Maxwelton, WV 24957	Special	L	L	L	L	L	L	M	L	M	M	L	M	M
American Tower (AT&T)	621 Cavendish Rd, Rainelle, WV 25962	Special	L	L	L	L	L	L	L	L	M	M	L	M	M

Amerigas Propane LP	38426 Midland Trail E, Caldwell, WV 24925	Special	L	L	L	L	L	L	M	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Anthony Correctional Facility	313 Anthony Center Drive, White Sulphur Springs, WV 24986	Vulnerable	L	L	L	L	L	L	L	M	M	M	L	M	M
Anthony Creek VFD/Rescue Squad	12584 Pocahontas Trail, White Sulphur Springs, WV 24986	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
Argabrite House	504 Virginia St. Alderson, WV 24910	Historic	L	L	L	L	L	L	L	L	M	M	L	M	M
Autumn Way	411 Nicholas St, Rupert, WV 25984	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M
Beech Ridge Energy LLC (Invenergy)	128 Coleman Rd., Richwood, WV 26261	Special	L	L	L	L	L	L	L	L	M	M	L	M	H
Blue Bend Fort Camp	8096 Anthony Road, White Sulphur Springs, WV 24986	Historic	L	L	L	L	L	L	L	L	M	M	L	M	M
Blue Sulphur Springs Pavilion	301 W Washington St, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Boxley Trucking	21073 Midland Trail W, Lewisburg, WV 24901	Special	L	L	L	L	L	L	M	L	M	M	L	M	M
Bridges	Region-wide	Special	L	L	L	H	L	M	L	M	M	M	L	M	H
Burns Motor Freight	342 Burns Motor Frieght Access Rd, Crawley, WV 24931	Special	L	L	L	L	L	L	L	L	M	M	L	M	M
Carnegie Hall	611 Church St, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Clintonville FD	18918 Midland Trail W, Crawley, WV 24931	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
Confederate Cemetery at Lewisburg	205 Mc Elhenny Road, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M

Coronado Coal LLC	4425 Anjean Road, Rupert, WV 25984	Economic	L	L	L	L	L	L	L	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Crichton ES	133 School ST, Quinwood, WV 25981	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	H
Crosswinds Center (Crisis/Detox)	414 Industrial Park Rd Maxwelton, WV 24957	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
David S. Creigh House	478 Davis Stuart Road, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Davita Disalysis	9745 Seneca Trail S, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Dawson Dam	300 Lake View Dr W, Alderson, WV 24910	Critical	L	L	L	L	L	L	L	M	M	M	L	M	M
Deitz Farm	168 Jones Road, Smoot, WV 24977	Historic	L	L	L	L	L	L	L	L	M	M	L	M	M
Eastern Greenbrier MS	403 Knight Drive, Ronceverte, WV 24970	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Elmhurst	33794 Midland Trail E, Ronceverte, WV 24970	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Fairlea VFD	250 Third St. Fairlea, WV 24901	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M
Fairlead Senior Center	150 Taylor Lane, Ronceverte, WV 24970	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Ferrellgas	272 Alta Heights Rd., Asbury, WV 24916	Special	L	L	L	L	L	L	L	L	M	M	L	M	M
FPC Alderson	1 Glen Ray Rd. Alderson, WV 24910	Vulnerable	L	L	L	L	L	L	L	M	M	M	L	M	M
Frankford ES	21692 Seneca Trail, Frankford, WV 24938	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M

Frankford VFD	123 Water St E, Frankford, WV 24938	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Fresenius Dialysis	1255 Maplewood Ave, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Frontier (Lewisburg)	473 Maplewood Ave., Lewisburg, WV 24901	Special	L	L	L	L	L	L	M	L	M	M	L	M	M
Frontier (Rainelle)	301 Main St, Rainelle, WV 25962	Special	L	L	L	L	L	L	L	L	M	M	L	M	M
Frontier (White Sulphur Springs)	345 Drewery Ave, White Sulphur Springs, WV 24986	Special	L	L	L	L	L	L	L	L	M	M	L	M	M
Frontier Alderson	656 Maple Ave. W, Alderson, WV 24910	Special	L	L	L	L	L	L	L	L	M	M	L	M	M
Frontier Communications (Frankford)	22010 Seneca Trail N, Frankford, WV 24938	Special	L	L	L	L	L	L	M	L	M	M	L	M	M
Gov. Samuel Prince House	224 N Court St. Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Greenbrier Co. Emergency Ambulance Service	257 3rd St. Fairlea, WV 24901	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M
Greenbrier Co. Sheriff Office	920 S Court St, Lewisburg, WV 24901	Critical	L	L	L	L	L	L	M	M	M	M	L	M	M
Greenbrier County 911 Center	173 Arbuckle Ln Maxwelton,WV 24957	Critical	L	L	L	M	L	L	M	M	M	M	L	M	M
Greenbrier County BOE	197 Chestnut St. Lewisburg, WV 24901	Critical	L	L	L	M	L	L	M	M	M	M	L	M	M
Greenbrier County BOE Bus Garage	387 Judyville Rd, Lewisburg,WV 24901	Critical	L	L	L	M	L	L	M	M	M	M	L	M	M
Greenbrier County Courthouse	912 S Court St, Lewisburg, WV 24901	Critical	L	L	L	L	L	L	M	M	M	M	L	M	M

Greenbrier County Economic Development-Rahall Technology & Business Center	804 Industrial Park Rd, Maxwelton, WV 24957	Economic	L	L	L	L	L	L	M	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Greenbrier County Health Department	9109 Seneca Trail S, Ronceverte, WV 24970	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M
Greenbrier County OES	171 Arbuckle Ln, Maxwelton,WV 24957	Critical	L	L	L	M	L	L	M	M	M	M	L	M	M
Greenbrier County PSD I Sewer Treatment Lewisburg	9035 Seneca Trail South, Ronceverte, WV 24970	Critical	L	L	L	M	L	L	M	M	M	M	L	M	M
Greenbrier East HS	273 Spartan Lane, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Greenbrier Episcopal School	3100 Houffnagle Rd, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Greenbrier Hotel Corp/Greenbrier Resort Management	101 Main Street W, White Sulphur Springs, WV 24986	Special	L	L	L	L	L	L	L	L	M	M	L	M	M
Greenbrier Manor	1115 Maplewood Ave, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Greenbrier Physicians Clinic	1322 Maplewood Ave, Ronceverte, WV 24970	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Greenbrier PSD II Crichton Water Plant	4457 Coalfield Trail, Quinwood,WV 25981	Critical	L	L	L	M	L	L	L	M	M	M	L	M	H
Greenbrier PSD II Sewer Treatment Plant-Rainelle	216 Snake Island Rd,Rainelle, WV 25962	Critical	L	L	L	M	L	L	L	M	M	M	L	M	M
Greenbrier Valley Airport	584 Airport Rd, Lewisburg, WV 24901	Critical	L	L	L	M	L	L	M	M	M	M	L	M	M
Greenbrier Valley Medical Center	1320 Maplewood Ave.Ronceverte, WV 24970	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Greenbrier West HS	278 Cavalier Drive, Charmco, WV 25958	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M

Hartland	2521 Houfnaggle Road, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Herns Mill Covered Bridge	1509 Herns Mill Road, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Hokes Mill Covered Bridge	258 Hokes Mill Road, Ronceverte, WV 24970	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Home Health Care Services	1647 Maplewood Ave, Ronceverte 24970	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Homeplace	16966 U.S. 219, Frankford, WV 24938	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Howard Creek Dam	4826 Tuckahoe Rd, White Sulphur Springs, WV 24986	Critical	L	L	L	L	L	L	L	M	M	M	L	M	M
James Withrow House	200 N. Jefferson St., Lewisburg, WV 24901	Historic	L	L	L	H	L	L	M	L	M	M	L	M	M
James Wylie House	208 E. Main St., White Sulphur Springs, WV 24986	Historic	L	L	L	L	L	L	L	L	M	M	L	M	M
John A. North House	100 Church St., Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
John Wesley Methodist Church	208 E Foster Street, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Lewisburg Baptist Academy	246 Grand Avenue, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Lewisburg ES	492 Washington St., Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Lewisburg PD	119 Preston Blvd, Lewisburg, WV 24901	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M
Lewisburg Town Hall	942 Washington St, Lewisburg, WV 24901	Critical	L	L	L	L	L	L	M	M	M	M	L	M	M

Lewisburg VFD Stn 1	200 Foster St., Lewisburg, WV 24901	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Lewisburg VFD Stn 2	3673 Jefferson St, Lewisburg, WV 24901	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M
Lewisburg Water Plant	2539 Stonehouse Rd, Lewisburg, WV 24901	Critical	L	L	L	M	L	L	M	M	M	M	L	M	M
Lowes (Lewisburg)	258 Gateway Blvd, Lewisburg, WV 24901	Special	L	L	L	L	L	L	M	L	M	M	L	M	M
Meadow Garden	276 Pennsylvania Ave, Rainelle, WV 25962	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M
Meadow River Hardwood Lumber	305 Snake Island Rd, Rainelle, WV 25962	Special	L	L	L	L	L	L	L	L	M	M	L	M	M
Meadow River Lumber Building	891 Maplewood Ave, Ronceverte, WV 24970	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Med Express	1560 Jefferson St N Ste A, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Mon Power/First Energy	9176 Seneca Trail S, Ronceverte, WV 24970	Special	L	L	L	L	L	L	M	L	M	M	L	M	M
Morlunda	2166 Herns Milld Road, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Mountain Home	36655 U.S. 60, Caldwell, WV 24925	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Mt. Tabor Baptist Church	203 E Foster St, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
New River Community and Technical College	653 Church St, Lewisburg, WV 24901	Economic	L	L	L	M	L	L	M	L	M	M	L	M	M
Northern Greenbrier Clinic	6633 Shoestring Trl, Williamsburg, WV 24991	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M

Oakhurst Links	1 Montague Dr. White Sulphur Springs, WV 24986	Historic	L	L	L	H	L	L	L	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Old Stone Church	200 Church St, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Peyton Hospice Home	1265 Maplewood Ave, Lewisburg 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
PFC Ralph E Pomeroy USARC	259 John Raine Dr., Rainelle, Wv 25962	Special	L	L	L	L	L	L	L	L	M	M	L	M	M
Quinwood Emergency Ambulance Service	111 McClung St, Quinwood, WV 25981	Critical	L	L	L	L	L	L	L	L	M	M	L	M	H
Quinwood Town Hall	129 School Street, Quinwood, WV 25981	Critical	L	L	L	L	L	L	L	M	M	M	L	M	H
Quinwood VFD	149 Amick St E, Quinwood, WV 25981	Critical	L	L	L	L	L	L	L	L	M	M	L	M	H
Railways	Region-wide	Special	L	L	L	H	L	M	L	M	M	M	L	M	H
Rainelle Christian Academy	1256 James River Kanawha Turnpike, Rainelle, WV 25962	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M
Rainelle ES	634 Kanawha Avenue, Rainelle, WV 25962	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M
Rainelle Medical Center	176 Medical Center Dr, Rainelle, WV 25962	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M
Rainelle PD/Town Hall	1233 Kanawha Ave, Rainelle, WV 25962	Critical	L	L	L	L	L	L	L	M	M	M	L	M	M
Rainelle VFD	212 James River & Kanawha Tpk., Rainelle, WV 25962	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
Rainelle Water Plant	159 Ohio Ave, Rainelle,WV 25962	Critical	L	L	L	L	L	L	L	M	M	M	L	M	M

Renick Town Hall	135 Church Lane, Renick, WV 24966	Critical	L	L	L	L	L	L	M	M	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Renick VFD	27019 Seneca Trail N, Renick, WV 24966	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
Res-Care	650 Court St S, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Residential	Region-wide	Special	L	L	L	H	L	L	M	L	M	M	L	M	H
Rhema Christian Center	3584 Davis Stuart Rd, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Roads	Region-wide	Special	L	L	L	H	L	M	M	M	M	M	L	M	H
Robert C Byrd Clinic	1464 Jefferson St N, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Ronceverte ES	246 Ronceverte Elementary School Dr, Ronceverte, WV 24970	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Ronceverte PD	206 Main St. W, Ronceverte, WV 24970	Critical	L	L	L	L	L	L	M	M	M	M	L	M	M
Ronceverte Town Hall	182 Main St W, Ronceverte, WV 24970	Critical	L	L	L	L	L	L	M	M	M	M	L	M	M
Ronceverte VFD	722 Ronceverte Ave, Ronceverte, WV 24970	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M
Ronceverte Water Plant	330 Monroe Ave. Ronceverte, WV 24970	Critical	L	L	L	M	L	L	M	M	M	M	L	M	M
Ronceverte WWTP	330 River Rd, Ronceverte, WV 24970	Critical	L	L	L	H	L	L	M	M	M	M	L	M	M
Rupert ES	279 Church Street, Rupert, WV 25984	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M

Rupert Senior Center	284 Greenbrier St, Rupert, WV 25984	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Rupert Town Hall	584 Nicholas St, Rupert WV 25984	Critical	L	L	L	L	L	L	L	M	M	M	L	M	M
Rupert VFD	217 Church St, Rupert, WV 25984	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
Rupert Water Plant	251 Cranberry Ave. Rupert, WV 25984	Critical	L	L	L	M	L	L	L	M	M	M	L	M	M
Sam Black Church	12090 Midland Trail W, Crawley, WV 24931	Historic	L	L	L	L	L	L	L	L	M	M	L	M	M
Seasons Genesis Healthcare	177 Holt Lane, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Seneca Behavioral Health Services Clinic	804 Industrial Park Rd, Maxwelton, WV 24957	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Seneca Trail Christian Academy	321 Trailblazer Dr, Ronceverte, WV 24970	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Smoot ES	223 Smokie Lane,Smoot, WV 24977	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M
Smoot VFD	2181 Grassy Meadows Rd., Smoot, WV 24977	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
Southern States COOP	608 Monroe Ave., Ronceverte, WV 24970	Special	L	L	L	H	L	L	M	L	M	M	L	M	M
Spanforce Labor, LLC	200 W. Washington St., Lewisburg, WV 24901	Economic	L	L	L	L	L	L	M	L	M	M	L	M	M
Stone Manse	1464 Stonehouse Road, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Stuart Manor	1999 Davis Stuart Road, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M

Suburban Propane	192 Twenty Third St., Rainelle, WV 25962	Special	L	L	L	L	L	L	L	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Supreme Court Library Building	301 W Washington St, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
The Brier	979 Rocky Hill Road, Ronceverte, WV 24970	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
The Greenbrier Clinic	40823 Midland Trail E, White Sulphur Springs, WV 24986	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M
The Kroger Company	178 Red Oaks Shopping Ctr, Ronceverte, WV 24970	Economic	L	L	L	L	L	L	M	L	M	M	L	M	M
Tri-County VFD	195 Tri-County Fire Department Rd, Alderson	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
Tuckwiller Tavern	29614 Midland Trail E, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
Tuscawilla	1 Tuscawilla Farm Road, Lewisburg, WV 24901	Historic	L	L	L	L	L	L	M	L	M	M	L	M	M
U Save Propane	272 Grey Gables Rd. Crawley, WV 24931	Special	L	L	L	L	L	L	L	L	M	M	L	M	M
US Fish and Wildlife Service National Fish Hatchery System	1087 Main Street East , White Sulphur Springs, WV 24986	Special	L	L	L	L	L	L	L	M	M	M	L	M	M
VA Clinic	3588 Davis Stuart Rd, Lewisburg, WV 24901	Vulnerable	L	L	L	L	L	L	M	L	M	M	L	M	M
Wal Mart (Lewisburg)	1976 Jefferson St. N, Lewisburg, WV 24901	Economic	L	L	L	L	L	L	M	L	M	M	L	M	M
West Virginia State Fairgrounds	947 Maplewood Ave., Fairlea, WV 24901	Special	L	L	L	L	L	L	M	M	M	M	L	M	M
Western Greenbrier MS	315 Timberwolf Drive, Crawley, WV 24931	Vulnerable	L	L	L	L	L	L	L	L	M	M	L	M	M

Westrock Mead Westvaco Gauley Wood Yard	11014 Midland Trail W, Rupert, 25984	Special	L	L	L	L	L	L	L	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
White Sulphur Springs Civic Center	24 Tressel St, White Sulphur Springs, WV 24986	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
White Sulphur Springs EMS	206 Bob White Lane, White Sulphur Springs, WV 24986	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
White Sulphur Springs EMS/Northern Greenbrier EMS	467 McLaughlin Ln, Maxwelton, WV 24957	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M
White Sulphur Springs ES	150 Reed St., White Sulphur Springs, WV 24986	Vulnerable	L	L	L	H	L	L	L	L	M	M	L	M	M
White Sulphur Springs PD	585 Main St. W., White Sulphur Springs, WV 24986	Critical	L	L	L	L	L	L	L	M	M	M	L	M	M
White Sulphur Springs Town Hall	589 Main St West., White Sulphur Springs, WV 24986	Critical	L	L	L	L	L	L	L	M	M	M	L	M	M
White Sulphur Springs VFD	195 Bob White Lane., White Sulphur Springs, WV 24986	Critical	L	L	L	L	L	L	L	L	M	M	L	M	M
White Sulphur Springs WTP	1266 Big Draft Rd, White Sulphur Springs, WV 24986	Critical	L	L	L	M	L	L	L	M	M	M	L	M	M
White Sulphur Springs WWTP	267 John H. Bowling,Jr Drive, White Sulphur Springs, WV 24986	Critical	L	L	L	H	L	L	L	M	M	M	L	M	M
Williamsburg Community Center	6571 Shoestring Trail, Williamsburg, WV 24991	Critical	L	L	L	L	L	L	M	L	M	M	L	M	M
Williamsburg VFD	6571 Shoestring Trail, Williamsburg, WV 24991	Critical	L	L	L	M	L	L	M	L	M	M	L	M	M
WV National Guard Lewisburg Readiness Center	635 Industrial Park Road, Maxwelton, WV 24957	Special	L	L	L	L	L	L	M	L	M	M	L	M	M
WV Paving	21195 Midland Trail West, Lewisburg, WV 24901	Special	L	L	L	L	L	L	M	L	M	M	L	M	M

WV School of Osteopathic Medicine	400 N Lee Street, Lewisburg, WV 24901	Economic	L	L	L	L	L	L	M	L	M	M	L	M	M

Greenbrier County Asset Inventory															
Name	Address	Type	Dam	Drought	arthquak	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
WVSP-Lewisburg	381 Greenbrier Road, Lewisburg, WV 24901	Critical	L	L	L	L	L	L	M	M	M	M	L	M	M
WVSP-Rainelle	354 John Raine Drive, Rainelle, WV 25962	Critical	L	L	L	L	L	L	L	M	M	M	L	M	M

Nicholas County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Beaver Mill	West Webster Rd., Craigsville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Birch River Elementary School	379 Birch River Road, Birch River, Wv 26610	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Birch River Fire Department	537 Firehouse Road, Birch River, Wv, 26610	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Bridges	Region-wide	Special	L	L	L	H	L	M	L	M	M	M	M	M	H
Brock Hotel	1400 Webster Rd., Summersville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Brown, Dr. Flavius, House	Old Wilderness Rd., Summersville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Carden, James B., House	1082 Country Rd., Summersville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	H
Cherry River Elementary School	190 Riverside Drive, Richwood, Wv 26261	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	H
Columbia WV Inc.	242 Callahan Rd, Tioga, Wv 26691	Economic	L	L	L	L	L	L	L	L	M	M	M	M	M
Craigsville-Beaver-Cottle Volunteer Fire Department	Webster Road, Craigsville, Wv, 26205	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Dixie Elementary School	1988 Dixie Highway, Dixie, Wv 25059	Vulnerable	L	L	L	H	L	L	L	L	M	M	M	M	M
Gauley River Elementary School	100 School Street, Craigsville, Wv 26205	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Glade Creek Elementary School	7950 Webster Road, Summersville, Wv 26651	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Halstead, Capt. John, Farm	Whitewater Rd., Cty Rd. 9, Kesslers Cross Lanes, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Hamilton, Martin, House	Wv 39, Summersville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	H
Hookersville Muddlety Volunteer Fire Department	479 Hookersville Road, Summersville, Wv, 26651	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan-Care Ambulance Service Incorporated - Craigsville	Richwood Road, Craigsville, Wv, 26205	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Jan-Care Ambulance Service Incorporated - Summersville	1112 Broad Street, Summersville, Wv, 26651	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M

Kesslers Cross Lane Volunteer Fire Service	State Highway 129, Keslers Cross Lanes, Wv, 26675	Critical	L	L	L	L	L	L	L	L	M	M	M	M	H

Nicholas County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Lowes (Summersville)	5200 Webster Road, Summersville, Wv 26651	Economic	L	L	L	H	L	L	L	L	M	M	M	M	M
Mason--Drennen House	Jct. Of Wv 39 And Wv 129, Drennen, Wv	Historical	L	L	L	H	L	L	L	L	M	M	M	M	H
Mount Lookout Elementary School	1945 Mt. Lookout Road, Mt. Lookout, Wv 26678	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	H
Mount Nebo Elementary School	110 Schoolhouse Lane, Mt. Nebo, Wv 26651	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Nettie Fire Department Incorporated	314 Leivasy Road, Nettie, Wv, 26681	Critical	L	L	L	L	L	L	L	L	M	M	M	M	H
New Life Christian Academy	899 Broad Street, Summersville, Wv 25561	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Nicholas County Bank	800 Main St., Summerville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Nicholas County BOE	400 Old Main Drive, Summersville, Wv 26651	Economic	L	L	L	L	L	L	L	L	M	M	M	M	M
Nicholas County Career/Technical Center	215 Milam Additiona Avenue, Craisgsville, Wv 26205	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Nicholas County Courthouse	700 Main St, Summersville, Wv 26651	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Nicholas County Courthouse	700 Main St., Summersville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Nicholas County Emergency Operations Center	511 Church Street, Summersville, Wv, 26651	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Nicholas County Health Care Center	18 Fourth Street, Richwood, Wv, 26261	Vulnerable	L	L	L	H	L	L	L	L	M	M	M	M	H
Nicholas County High School	Main St., Summerville, Wv	Historical	L	L	L	L	L	L	L	L	M	M	M	M	M
Nicholas County High School	30 Grizzley Lane, Summersville, Wv, 26651	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Nicholas County Sherriff	700 Main St, Summersville, Wv 26651	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Panther Creek Elementary School	10068 Canvas Nettie Road, Nettie, Wv 26681	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	H
Quinwood Emergency Ambulance Incorporated	State Route 20, Nettie, Wv, 26681	Critical	L	L	L	L	L	L	L	L	M	M	M	M	H

Railways	Region-wide	Special	L	L	L	H	L	M	L	M	M	M	M	M	H

Nicholas County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Redi Care Incorporated Station 1	371 Williams Road, Craigsville, Wv, 26205	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Redi Care Incorporated Station 2	75 B Avenue, Richwood, Wv, 26261	Critical	L	L	L	H	L	L	L	L	M	M	M	M	H
Residential	Region-wide	Special	L	L	L	H	L	L	L	L	M	M	M	M	H
Richwood Area Community Hospital	75 Avenue B, Richwood, Wv, 26261	Vulnerable	L	L	L	H	L	L	L	L	M	M	M	M	H
Richwood High School	1 Valley Avenue, Richwood, Wv 26261	Vulnerable	L	L	L	H	L	L	L	L	M	M	M	M	H
Richwood Hospital, D/P	75 Ave B, Richwood, Wv, 26261	Vulnerable	L	L	L	H	L	L	L	L	M	M	M	M	H
Richwood Middle School	2 Valley Avenue, Richwood, Wv 26261	Vulnerable	L	L	L	H	L	L	L	L	M	M	M	M	H
Richwood Volunteer Fire Department	10 White Avenue, Richwood, Wv, 26261	Critical	L	L	L	H	L	L	L	L	M	M	M	M	H
Roads	Region-wide	Special	L	L	L	H	L	M	L	M	M	M	M	M	H
Seventh Day Adventist School	70 Friends R Fun Drive, Summersville, Wv 26651	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Summersville Elementary School	108 Mckees Creek Road, Summersville, Wv 26651	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Summersville Memorial Hospital	400 Fairview Heights Road, Summersville, Wv, 26651	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Summersville Memorial Hospital D/P	400 Fairview Heights Road, Summersville, Wv, 26651	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Summersville Middle School	40 Grizzley Lane, Summersville, Wv 26651	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	M
Summersville Police Department	400 Broad Street, Summersville, Wv 26651	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Summersville Volunteer Fire Department	806 Arbuckle Road, Summersville, Wv, 26651	Critical	L	L	L	L	L	L	L	L	M	M	M	M	M
Wal-Mart (Summersville)	200 Wal Street, Summersville, Wv 26651	Economic	L	L	L	L	L	L	L	L	M	M	M	M	M
Wilderness Volunteer Fire Department	East Mount Lookout Road, Mount Lookout, Wv, 26678	Critical	L	L	L	L	L	L	L	L	M	M	M	M	H

WV DNR Police	400 Broad Street, Summersville, Wv 26651	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M

Nicholas County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
WVSP	12 White Avenue, Richwood, Wv 26261	Critical	L	L	L	H	L	L	L	M	M	M	M	M	H
WVSP	100 Service Road, Summersville, Wv 26651	Critical	L	L	L	L	L	L	L	M	M	M	M	M	M
Zela Elementary School	1073 Country Road, Summersville, Wv 26651	Vulnerable	L	L	L	L	L	L	L	L	M	M	M	M	H

Pocahontas County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Bartow PO	6784 Staunton Parkersburg Tpnk, Bartow WV 24920	Special	L	L	L	H	L	L	L	L	M	L	L	M	H
Bartow-Frank-Durbin VFD	40 Fourth Ave, Durbin WV 26264	Critical	L	L	L	L	L	L	M	L	M	L	L	M	H
Bartow-Frank-Durbin VFD Green Bank	6446 Potomac Highlands TRL, Green Bank WV 24944	Critical	L	L	L	L	L	L	L	L	M	L	L	M	H
Beckwith Lumber Company	34443 Seneca Trl, Slaty Fork WV 24291	Economic	L	L	L	L	L	L	L	L	M	L	L	M	H
Bridges	Region-wide	Special	L	L	L	H	L	M	M	M	M	L	L	M	H
Buckeye PO	14333 Seneca Trl, Buckeye WV 24924	Special	L	L	L	L	L	L	M	L	M	L	L	M	M
Burns Motor Freight	18750 Seneca Trl, Marinton WV 24954	Economic	L	L	L	L	L	L	M	L	M	L	L	M	H
Cass Historic District	230 Main Street, Cass, WV 24927	Historical	L	L	L	L	L	L	L	L	M	L	L	M	H
Cass Scenic Railroad	244 Main St, Cass WV 24927	Historical	L	L	L	L	L	L	L	L	M	L	L	M	H
Cass VFD	1018 Cass Rd, Cass WV 24927	Critical	L	L	L	L	L	L	L	L	M	L	L	M	H
Droop Mountain Battlefield	683 Droop Park Road, Hillsboro, WV 24946	Historical	L	L	L	L	L	L	M	L	M	L	L	M	M
Dunmore PO	242 Potomac Highlands Trl, Green Bank WV 24934	Special	L	L	L	L	L	L	L	L	M	L	L	M	M
Durbin PO	4345 Staunton Parkersburg Tpnk, Durbin WV 26264	Special	L	L	L	L	L	L	M	L	M	L	L	M	H
Durbin Sewage Plant	294 Meadow LN, Durbin WV 26264	Critical	L	L	L	L	L	L	M	M	M	L	L	M	H
Foodland Grocery	18838 Seneca Trl, Marlinton WV 24954	Special	L	L	L	L	L	L	M	L	M	L	L	M	H
Frank and Anna Hunter House	909 Seneca Trail, Marlinton, WV 24954	Historical	L	L	L	L	L	L	M	L	M	L	L	M	M
Frontier Communications	904 3rd Ave, Marlinton WV 24954	Critical	L	L	L	H	L	L	M	M	M	L	L	M	M
Frost VFD	217 Pocahontas HWY, Marlinton WV 24954	Critical	L	L	L	H	L	L	M	L	M	L	L	M	M

Green Bank ES-MS	5917 Potomac Highlands Trl, Green Bank WV 24944	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	H

Pocahontas County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Green Bank PO	5314 Potomac Highlands Trl, Green Bank WV 24944	Special	L	L	L	L	L	L	L	L	M	L	L	M	H
Hillsboro ES	21 Elementary School Ln, Hillsboro WV 24946	Vulnerable	L	L	L	L	L	L	M	L	M	L	L	M	M
Hillsboro VFD	7530 Seneca Trl, Hillsboro WV 24946	Critical	L	L	L	L	L	L	M	L	M	L	L	M	M
Inter-State Hardwoods	6954 Staunton Parkersburg Tpnk, Bartow WV 24920	Economic	L	L	L	H	L	L	L	L	M	L	L	M	H
IOOF Lodge Building	101 8th St, Marlinton, WV 24954	Historical	L	L	L	L	L	L	M	L	M	L	L	M	M
Locust Creek Covered Bridge	Co Rte 31, Renick, WV 24966, USA	Historical	L	L	L	L	L	L	M	L	M	L	L	M	M
Marlinton Chesapeake and Ohio Railroad Station	300 8th St, Marlinton, WV 24954	Historical	L	L	L	H	L	L	M	L	M	L	L	M	M
Marlinton ES	905 5th Ave, Marlinton WV 24954	Vulnerable	L	L	L	H	L	L	M	L	M	L	L	M	M
Marlinton Fire Rescue	709 Second Avenue Marlinton WV 24954	Critical	L	L	L	H	L	L	M	L	M	L	L	M	M
Marlinton MS	1 Copperhead Way, Marlinton WV 24954	Vulnerable	L	L	L	H	L	L	M	L	M	L	L	M	M
Marlinton Opera House	818 3rd Ave, Marlinton, WV 24954	Historical	L	L	L	H	L	L	M	L	M	L	L	M	M
Marlinton PO	823 4th Ave, Marlinton WV 24954	Special	L	L	L	L	L	L	M	L	M	L	L	M	M
Marlinton Water Plant	1002 9th Ave, Marlinton WV 24954	Critical	L	L	L	H	L	L	M	M	M	L	L	M	M
McNeel Mill	9992 Seneca Trail, Hillsboro, WV 24946	Historical	L	L	L	L	L	L	M	L	M	L	L	M	M
National Radio Astronomy Observatory	155 Observatory Rd, Green Bank WV 24944	Special	L	L	L	L	L	L	L	L	M	L	L	M	H
Pearl Buck House	8129 Seneca Trail, Hillsboro, WV 24946	Historical	L	L	L	L	L	L	M	L	M	L	L	M	M
Pocahontas County 911/OEM Office	1008 Jury Street Buckeye WV 24954	Critical	L	L	L	H	L	L	L	M	M	L	L	M	M
Pocahontas County Continuous Care Center	5 Evertt Tibbs Rd, Marlinton WV 24954	Vulnerable	L	L	L	H	L	L	M	L	M	L	L	M	M

Pocahontas County Courthouse	900 10th Avenue Marlinton WV 24954	Critical	L	L	L	H	L	L	L	M	M	L	L	M	M

Pocahontas County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Pocahontas County Courthouse and Jail	900C Tenth Ave., Marlinton, WV 24954	Historical	L	L	L	H	L	L	L	L	M	L	L	M	M
Pocahontas County HS	271 Warrior Way, Dunmore WV 24934	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	M
Pocahontas Memorial Hospital	150 Duncan Rd, Marlinton WV 24954	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	M
Pocahontas Pharmacy	105 Duncan Rd, Marlinton WV 24954	Special	L	L	L	L	L	L	L	L	M	L	L	M	M
Pocahontas Times Print Shop	810 2nd Ave, Marlinton, WV 24954	Historical	L	L	L	H	L	L	M	L	M	L	L	M	M
Railways	Region-wide	Special	L	L	L	H	L	M	M	M	M	L	L	M	H
Reber Radio Telescope	155 Observatory Rd, Green Bank WV 24944	Historical	L	L	L	L	L	L	L	L	M	L	L	M	H
Residential	Region-wide	Special	L	L	L	H	L	L	M	L	M	L	L	M	H
Rite Aid (Marlinton)	19254 Seneca Trl, Marlinton WV 24954	Special	L	L	L	L	L	L	M	L	M	L	L	M	H
Roads	Region-wide	Special	L	L	L	H	L	M	M	M	M	L	L	M	H
Shavers Fork VFD	150 Rescue Rd, Snowshoe WV 26209	Critical	L	L	L	L	L	L	M	L	M	L	L	M	H
Slatyfork PO	35161 Seneca Trl, Slaty Fork WV 26291	Special	L	L	L	L	L	L	L	L	M	L	L	M	H
Snowshoe Mountain Resort	10 Snowshoe Dr, Snowshoe WV 26209	Economic	L	L	L	L	L	L	M	L	M	L	L	M	H
WV Dept. of Corrections - Denmar	4319 Denmar Road Hillsboro WV 24946	Vulnerable	L	L	L	L	L	L	M	M	M	L	L	M	M

Webster County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
ANR Coal-WV LLC	61 Brooks Run Road, Erbacon	Economic	L	L	L	L	L	L	L	L	M	L	L	M	H
Bridges	Region-wide	Special	L	L	L	H	L	M	L	M	M	L	L	M	H
Camp Cesar	4868 Webster Road, Cowen 26206	Economic	L	L	L	L	L	L	L	L	M	L	L	M	H
Cowen PSD Water Plant	7017 Webster Road, Cowen 26206	Critical	L	L	L	L	L	L	L	M	M	L	L	M	H
Cowen VFD	90 Railroad Avenue, Cowen 26206	Critical	L	L	L	L	L	L	L	L	M	L	L	M	H
Craig Run East Fork Rock Shelter	Mills Moutain	Historical	L	L	L	L	L	L	L	L	M	L	L	M	H
Diana VFD	55 Guardian Drive, Diana 26217	Critical	L	L	L	L	L	L	L	L	M	L	L	M	H
Erbacon VFD	4900 Erbacon Road, Erbacon	Critical	L	L	L	L	L	L	L	L	M	L	L	M	H
Glade MS	25 Mill Street, Cowen	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	H
Hacker Valley ES	11 School Loop Road, Hacker Valley	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	H
Hacker Valley VFD	4999 Hacker Valley Road, Hacker Valley	Critical	L	L	L	L	L	L	L	L	M	L	L	M	H
ICG Eastern LLC	1101 Birch River Road	Economic	L	L	L	L	L	L	L	L	M	L	L	M	H
K&M Sales	655 Point Mountain Road, Webster Springs 26288	Economic	L	L	L	L	L	L	L	L	M	L	L	M	H
Laurel Run Rockshelter	Address Restricted	Historical	L	L	L	L	L	L	L	L	M	L	L	M	H
Leslie Equipment Co.	6248 Webster Road, Cowen	Economic	L	L	L	L	L	L	L	L	M	L	L	M	H
Mollohan Mill	1505 Poling Road, Hacker Valley 26222	Historical	L	L	L	H	L	L	L	L	M	L	L	M	H
Morton House	130 Union Street, Webster Springs 26288	Historical	L	L	L	L	L	L	L	L	M	L	L	M	H
Railways	Region-wide	Special	L	L	L	H	L	M	L	M	M	L	L	M	H

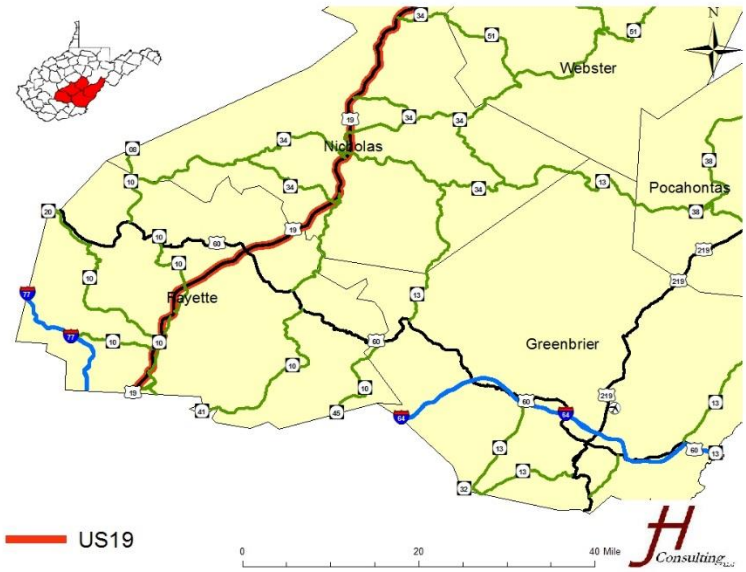
Webster County Asset Inventory															
Name	Address	Type	Dam	Drought	Earthquake	Flooding	Hail	Hazmat	Mass Movement	Terror	Thunderstorm	Tornado	Wildfire	Wind	Winter Weather
Residential	Region-wide	Special	L	L	L	H	L	L	L	L	M	L	L	M	H
Roads	Region-wide	Special	L	L	L	H	L	M	L	M	M	L	L	M	H
Seneca Mental Health	70 Parcoal Road, Webster Springs, WV 26288	Vulnerable	L	L	L	H	L	L	L	L	M	L	L	M	H
The Jim C. Hamer Co.	111 Mill Run Road, Webster Springs	Economic	L	L	L	L	L	L	L	L	M	L	L	M	H
Webster County Commission of Senior Citizens, Inc.	148 S. Court Street, Webster Springs	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	H
Webster County Head Start	60 Railroad Avenue, Cowen	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	H
Webster County HS	1 Highlander Drive, Upper Glade	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	H
Webster County Memorial Hospital	324 Miller Mountain Drive, Webster Springs	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	H
Webster County OES/911	210 Back Fork Street, Webster Springs	Critical	L	L	L	L	L	L	L	M	M	L	L	M	H
Webster County Sheriff's Office	2 Court Street, Webster Springs	Critical	L	L	L	L	L	L	L	M	M	L	L	M	H
Webster Nursing & Rehabilitation Center County Inc.	411 Erbacon Road, Cowen	Vulnerable	L	L	L	L	L	L	L	L	M	L	L	M	H
Webster Springs ES	318 River Drive, Webster Springs	Vulnerable	L	L	L	H	L	L	L	L	M	L	L	M	H
Webster Springs PD	146 McGraw Avenue, Webster Springs	Critical	L	L	L	H	L	L	L	M	M	L	L	M	H
Webster Springs PSD	38 Clean Water Lane, Webster Springs	Critical	L	L	L	L	L	L	L	M	M	L	L	M	H
Webster Springs VFD	55 McGraw Avenue, Webster Springs	Critical	L	L	L	L	L	L	L	L	M	L	L	M	H
WV American Water	520 Orchard Street, Webster Springs	Critical	L	L	L	H	L	L	L	M	M	L	L	M	H

2.4 ANALYZE DEVELOPMENT TRENDS

§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.

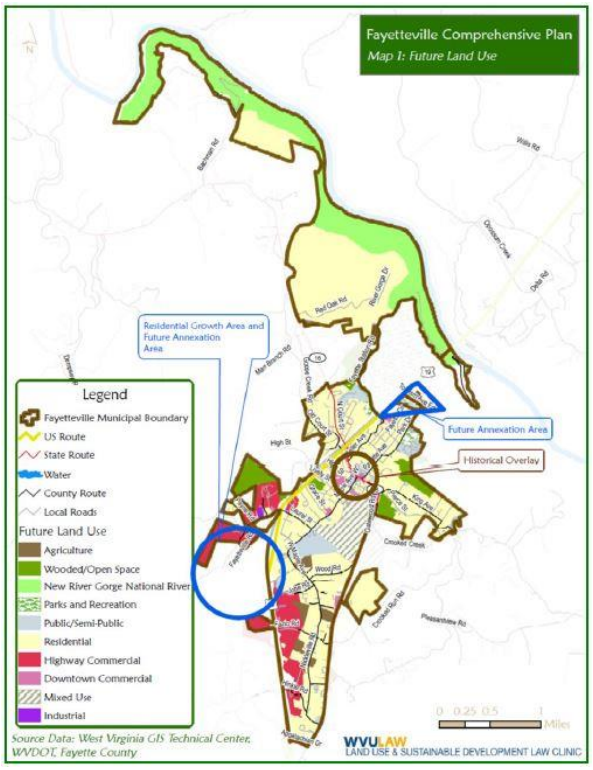
All five of the counties in Region 4 are largely rural in nature, with less than a third (31%) of the total population residing within municipal boundaries. The five counties are generally considered to be mountainous, which is limitation for development of non-natural resource based industry. Compounding this, the open flat land that there is in the region is generally located near rivers and creeks, placing much of the area in or near floodplains. Local floodplain management officials and development regulations, which will be discussed in more detail in the flooding hazard profile, have to carefully balance the economic development and growth needs of the region with the responsibility to protect existing and potential businesses from the effects of flooding.

The corridor between Summersville and Oak Hill (along U.S. 19) has been heavily developed with residential and retail establishments. A number of recreational areas, including Summersville Lake, the New River Gorge Bridge and Hawks Nest State Park, are located near this corridor. This makes tourism, especially during the summer months, a major industry in the area. The Interstate 64/77 corridor through western Fayette County and southern Greenbrier County has seen more commercial and industrial growth than other areas.



The Fayette County Comprehensive plan was adopted in 2011, and is divided into four planning districts: Danese/Meadow Bridge, New Haven, Plateau, and Valley. The Plateau Planning District is the center of development attention in Fayette County, due to its inherent flatness. This land is ideal for development and is in short supply within Fayette County and, which is also true throughout much of Region 4.

In the Town of Fayetteville's comprehensive plan one of the goals listed is to "encourage sound land use decisions and preserve open space, historical and scenic resources, community character, and provide for clean air and water." One of the numerous objectives to accomplish this is to simplify and improve land zoning within the town. The plan outlines future land use classifications: Agriculture, Wooded/Open Space, New River Gorge National River, Parks and Recreation, Public/Semi-Public land, Highway Commercial, Downtown Commercial, Mixed Used, and Industrial. The new Zoning Map identifies two annexation areas. The first is on the north end of the town along U.S. 19. The second is identified as a residential growth area and is located on the south west part of the town, also along U.S.19. The image to the left, taken from the Fayetteville comprehensive plan, shows future land uses and annexations.



Oak Hill, also located in Fayette County, updated their 1968 comprehensive plan in 2012. This update outlines three goals related to land use:

- Promote logical, efficient, and well-organized land use patterns that reduce conflicts among users.
- Guide and promote attractive, sustainable growth.

- Balance environmental sustainability and commercial growth by emphasizing the important role the environment will play in the future of the city.

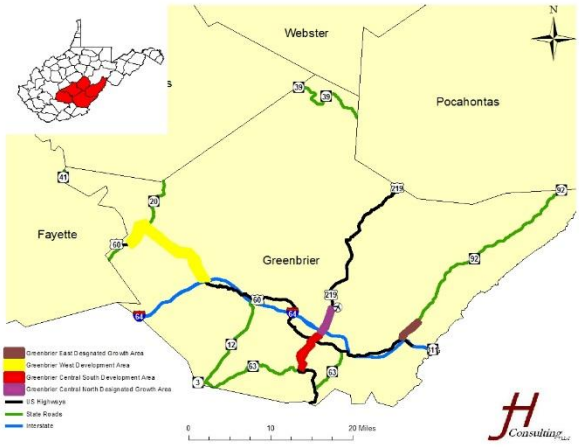
In order to meet these goals, the land use section lays out a number of recommendations. These recommendations include, among others, the concentrating of commercial development in existing commercial corridors, resisting development in floodplains, and balancing corridor development along U.S. Route 19 with infill development and redevelopment in Oak Hill's central business district.

The Greenbrier County Comprehensive plan adopted in September of 2014 discusses a policy of focused growth within Greenbrier County. This policy would focus growth into specific areas and zones that have (or can be made to have) adequate resources and services to support growth. A primary goal of the focused growth policy is to encourage development while maintaining the County's natural resources, environmental integrity, and cultural and historic heritage. The basic economy of Greenbrier County is driven by agriculture, natural resources, tourism, education and medical facilities. The county has a limited ability to attract major industrial and manufacturing firms without significant state government support.

Also included in the comprehensive plan is the identification of designated growth areas. These growth areas are the areas most suited for commercial, industrial, dense residential and public utilities and facilities to encourage cost effective development.

- **Greenbrier East Designated Growth Area:** Located on Route 92 north of White Sulfur Springs.
- **Greenbrier Central – North Designated Growth Area:** Located on Route 219 between the northern boundary of Lewisburg and the Greenbrier Valley Airport.
- **Greenbrier Central – South Designated Growth Area:** Located on the Route 219 corridor between Lewisburg and Ronceverte. This includes Fairlead, the north portion of Davis-Stuart, and the lands between 219 and Houfnagle Road.
- **Greenbrier West Development Area:** Located on the U.S. 60 corridor from Sam Black to Rainelle, including the I-64 Interchange and the towns of Rainelle, Rupert, and Quinwood and the villages of Charmco, McRoss, Hines, Crawley, and Route 20 south of Rainelle.

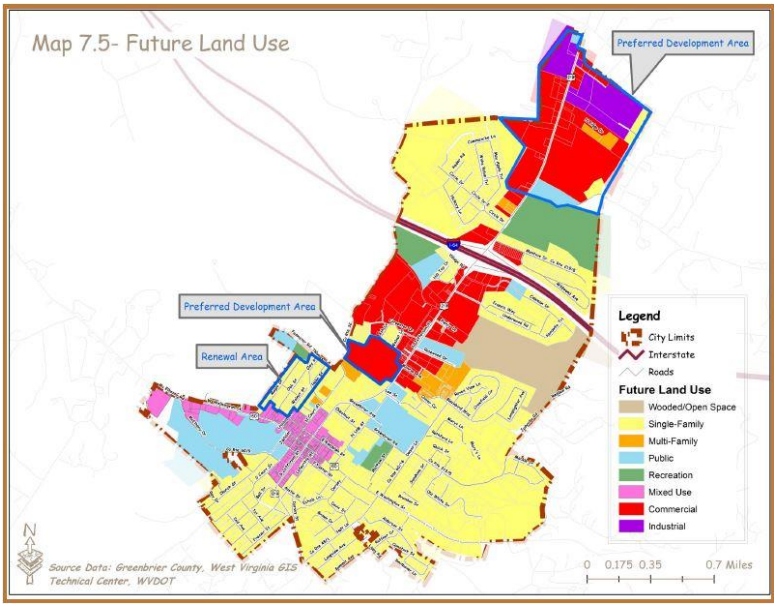
The map to the right shows the various designated growth areas in Greenbrier County based on their descriptions in the comprehensive plan.



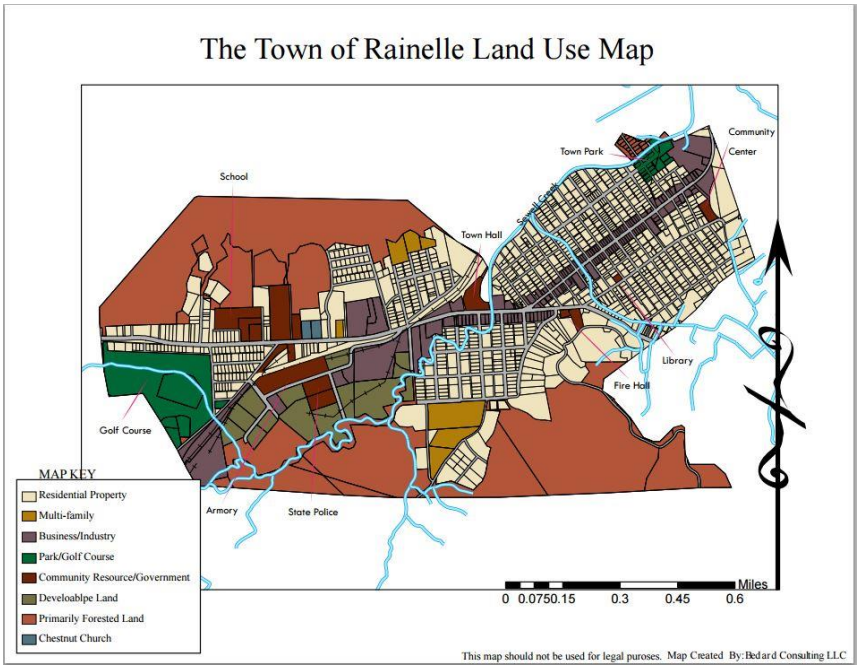
In addition to the Greenbrier County Comprehensive Plan, two of the municipalities (Lewisburg and Rainelle) have comprehensive plans.

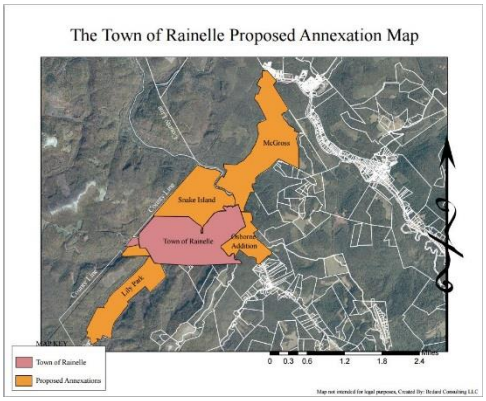
The City of Lewisburg Comprehensive Plan was adopted in late 2015 and features a section on land use planning. Currently there is a small amount of industrial development within the city limits. This development is located along U.S. 19, which is where large scale commercial development is also centered.

The comprehensive plan also identifies two areas of preferred development within the city limits. The first is the north end of the city limits and contains a mixture of zoning uses, though the two dominant zones are industrial and commercial. The second area is a commercially zoned area in the central-west portion of the city. The plan also identifies a renewal area just south west of the second development area which is zone as single family. Renewal areas are identified as slums or other blighted areas that are targeted for elimination or renewal through plans and programs. The image above, which was taken from the comprehensive plan, shows the various future land use designations and preferred development areas.



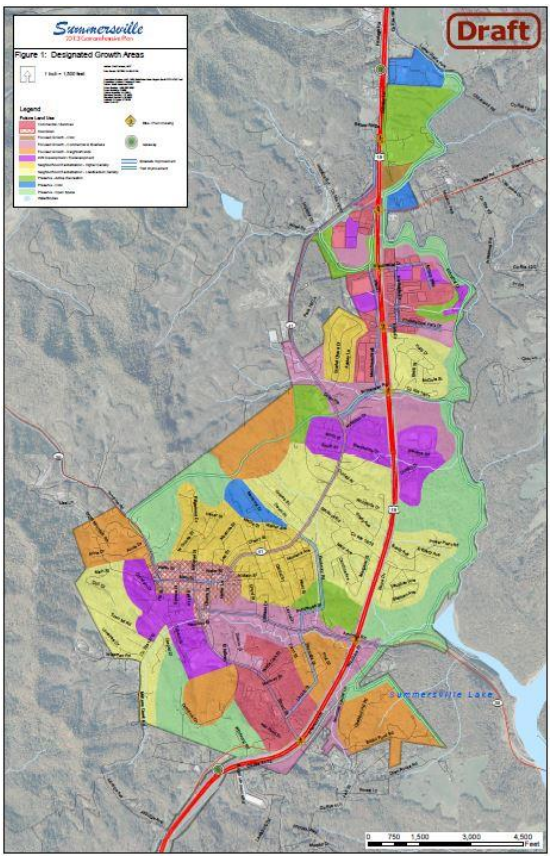
The Town of Rainelle, which is 1.1 square miles, adopted a comprehensive plan in 2013, which includes an analyzation of current land use and future development goals. The majority of commercial and business uses in the town are located along U.S. 60. Rainelle does have several acres of developable land that is zoned commercial on the southwestern side of the town. The area is relatively flat, has been cleared of trees and undergrowth, and has limited infrastructure. Residential development opportunities exist north of the town park; however this land is currently forested and has no supporting infrastructure built. Other than these two areas both commercial and residential development is limited to individual lots throughout the town, which may already have structures built or be partitions from larger lots. The image above shows the Rainelle land use map and identifies areas of developable land. The image to the left shows the areas that the Town proposed to annex in 2013. Both images are from the comprehensive Plan.





The remaining three counties (Nicholas, Pocahontas and Webster) do not currently have county wide comprehensive plans. According to a report from the Allegheny Mountain Radio, Pocahontas County is considering using the WVU Land Use Clinic to develop a comprehensive plan.

The City of Summersville, in Nicholas County, does have a comprehensive plan, approved in May of 2013. The plan includes a growth management framework with a number of goals related to future development. The City aims to concentrate new development in identified growth areas rather than allowing random development along roadway corridors. These focused growth areas are identified in the zoning map and include areas focused on civic development, commercial & business development, and neighborhoods. The image to the right shows the various designated growth areas within Summersville, taken from the comprehensive plan.



As this section has shown, a number of jurisdictions within Region 4 have plans that outline future land use planning efforts. These plans typically outline areas of future and targeted development and growth. Some of these areas will be more vulnerable for certain hazards based on where they are located.

The Region 4 Planning and Development Council's (PDC) mission is to "strategically and effectively plan for and facilitate the comprehensive development of Fayette, Greenbrier, Nicholas, Pocahontas, and Webster Counties" (Comprehensive Economic Development Strategy [CEDS] 2016 Update, 2016). The Region 4 Annual Report for 2013-2014 details a number of projects that have been supported by the PDC in an attempt to bring new and additional development to the area. A large number of these involve improvements to local public water and sewer systems to either extend of improve the service they provide (Annual Report, 2014).

3.0 ACTION PLAN

3.1 LOCAL HAZARD MITIGATION GOALS

§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.

A key component in this section is the development of goals and objectives that counties and municipalities can use to both develop and prioritize projects. These goals will generally line up with one or more specific hazards identified in the risk assessment. Those that are not hazard specific are referred to as "Misc."

Goals and objectives have been developed at the regional level with the input of the Hazard Mitigation Steering Committee and member jurisdictions. Goals are general statements of what the region would like to accomplish in reference to some hazard. Objectives support these goals by identifying more specific aims. The planning and development council's (PDC's) consultant led the steering committee through an activity to identify regional-level goals. The committee selected 13 broad goals. The goals are presented in the table below (with the priority order listed from top to bottom). Committee members wanted to preserve the flexibility offered by broad goals, yet wanted to provide direction to the many other stakeholders in the individual jurisdictions. As such, the committee identified objectives that could be categorized by those goals.

Individual participating jurisdictions selected strategies, which are specific mitigation projects and based on the regional goals and objectives. The PDC's consultant interfaced individually with participating jurisdictions to generate specific projects for those jurisdictions *after the committee determined regional goals and objectives*. Such timing allowed the consultant to ensure specific projects were consistent with regional goals and objectives. The consultant provided the master project list to the PDC and steering committee.

Hazard	Goals	Objectives
Flooding	Reduce the impact of flooding	Flooding prevention
		Lessening flood damage
		Informing citizens
		Maintain utility service
		Ensure updated information
		Ensure training for key personnel

Dam Failure	Reduce the impact of dam failures	Monitor for potential failure
		Develop partnerships
Drought	Reduce the impact of droughts	Ensure water access/supplies
		Informing citizens
		Reducing drought impacts
Hazardous Materials	Reduce the impact of hazardous materials incidents	Identify hazardous materials
		Develop/Maintain relationships
		Inform citizens
Mass Movement	Reduce the effects of mass movements	Identification and mitigation
		Informing citizens
		Developing plans/policies
Terrorism	Protect population from possible terrorist actions	Ensure preparedness of local agencies
Thunderstorms	Reduce damage from severe storms	Reduce occurrence and impact of power outages
		Informing citizens
Tornado	Reduce losses from tornado events	Informing citizens
		Maintain/Improve notification system
Wildfire	Reduce the effects of wildfire	Wildfire prevention
		Informing citizens
Wind	Reduce damage from severe storms	Reduce occurrence and impact of power outages
		Reduce property damage
Winter Weather	Reduce the negative effects of winter weather	Ensure emergency services can provide service
		Inform citizens
		Reduce occurrence and impact of power outages
		Prevent property damage
		Ensure access to critical facilities and assets
Misc.	Improve emergency response capability	Improve communications/notifications
		Information development
		Utilize existing programs for better preparedness
		Reduce occurrence and impact of power outages
		Increase emergency services training and resources
		Develop and maintain plans/policies
		Develop and maintain relationships
	Reduce the current and future risks from all hazards	Inform citizens
		Direct development to reduce risk
		Identify unique potential hazards

During the completion of this update, Region 4's counties experienced a major flooding incident (i.e., June 2016 – Presidential Disaster Declaration 4273). The flood resulted in extensive damage and local leaders expect the recovery process to be long and intensive. This incident prompted a modification of the regional hazard mitigation goals and objectives. It served to reinforce the selection of flood damage reduction as the priority goal for the region. In planning the recovery, local leaders worked extensively with federal and state disaster recovery and mitigation specialists. West Virginia added *mitigation reconstruction* as a viable flood mitigation method in the state's mitigation strategy. The jurisdictions throughout Region 4 recognize mitigation reconstruction as a viable strategy. As such, the steering committee then elected to include a regional mitigation strategy – a specific strategy that *applies to every jurisdiction in the region*. That strategy is as follows:

- Consider the implementation of mitigation reconstruction projects in flood prone areas when approved buildings are impacted by flooding disasters.

Other standard types of flood mitigation projects include acquisition, relocation, and/or demolition. The jurisdictions in the region have considered those types of efforts individually.

3.2 PROJECT IMPLEMENTATION

§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.

§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.

Project Implementation

This portion of the action plan builds on the regional goals and objectives that have been developed. Each strategy below is listed with a timeframe, primary coordinator, support agencies, potential funding source (and cost estimate), and its current status. Strategies are also categorized by six 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.

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.

Project Status

Hazard mitigation projects will fall into one of five status categories. These categories are completed, deleted, deferred, on-going and new. The PDC's consultant interfaced with representatives from the steering committee as well as the individual jurisdictions participating in the planning process to update the status of their projects as listed in the previous version of the hazard mitigation plan. Representatives frequently believed their existing project list to be valid; in those cases, the consultant updated the status to "On-going" and the project remained in the active action plan.

- **Completed**: The project, as it is written, has been completed in its entirety. Any reporting and/or paperwork has been closed out.
- **Deleted**: The project no longer aligns with local priorities or has been deemed unfeasible and is being removed from the plan.
- **Deferred**: The project is still a viable project; however, other priorities have forced its consideration to be moved to the future.
- **On-going**: The project has been started; work is currently being completed on the project and it is not anticipated to be done by the completed of the HMP update.
- **New**: The project is a newly conceived/developed project that was not included in prior versions of the HMP.

Projects listed as completed, deferred or deleted can be found in Appendix 4. Projects that are deferred, on-going and new are included in the Action Plan. Also included in the project list is a more in depth description of the current status of the project.

Project Prioritization

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.

County project prioritization occurred during the fourth Steering Committee meeting utilizing the project prioritization matrix. An example of this matrix can be found in Appendix 1; the example includes definitions of the criteria below.

Committee members were asked to rate each project on six criteria using a one to five scale where five is best. The criteria used are:

- Ease of Implementation
- Cost Effectiveness
- Social Impacts
- Political Impacts
- Economic Impacts
- Overall Positive Impact

The highest score that a proposed project could attain was 30 and the lowest was six. Steering committee representatives completed a matrix for the projects in for their county. In the case where multiple representatives scored the projects for any one county, the planning team used the average of the two scores. The highest scoring project received the Priority 1 designation; the second highest scoring project became Priority 2; and so on. Using this method, projects can end up with the same score (and, thus, priority). In instances where this occurred, committee members opted to list multiple projects at the same priority level rather than further stratify projects. For municipal projects, the representative who was involved with the project update was asked to provide priorities as part of the update. Projects are listed alphabetically within their counties.

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Fayette 1	Drought	9	Develop an outreach program on water conservation and the value of water saving devices	November 2016	November 2021	Public Service Districts (PSDs)	FCOES	Public Education and Awareness	Should not require significant funding	Local Funds
Status: On-going.										
Fayette 2	Drought	9	Develop a plan to have "watering points" in those areas of the county not served by public water (so citizens can obtain training water during droughts	November 2016	November 2021	FCOES	PSDs	Emergency Services	None	Local Funds
Status: On-going.										
Fayette 3	Wildfire	7	Promote awareness and enforcement of fire season laws	November 2016	November 2021	County Commission	FCOES; West Virginia Division of Forestry (WVDOF)	Public Education and Awareness	Unknown	Local Funds
Status: On-going.										
Fayette 4	Wildfire	10	Ensure public awareness of fire prevention practices, like safe clearing distance and debris management for homes in wooded areas	November 2016	November 2021	County Commission	FCOES; WVDOF	Public Education and Awareness	Unknown	Local Funds
Status: On-going.										
Fayette 5	Flooding	6	Develop a countywide storm water/drainage plan	November 2016	November 2021	County Commission	Municipal Councils	Property Protection	$1,500 - $8,000	CDBG; West Virginia Disaster Recovery Board
Status: On-going.										
Fayette 6	Flooding	8	Enforce the floodplain ordinance for all new construction	November 2016	November 2021	County Commission	County Floodplain Coordinator	Prevention	Part of existing budgets	Local Funds
Status: On-going.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Fayette 7	Flooding	12	Work with the WVDOH, WV Division of Natural Resources (WVDNR), WV Department of Environmental Protection (WVDEP), Soil Conservation Services (SCS), etc., to develop a stream restoration, bank stabilization, and maintenance plan.	November 2016	November 2021	County Commission	County Floodplain Coordinator, WVDOH, WVDNR, WVDEP, SCS	Natural Resource Protection	Should not require funding to coordinate	Local Funds
Status: On-going.										
Fayette 8	Flooding	5	Inform the public about debris programs. Pursue recycling, even if hauled to Raleigh or Kanawha Counties. Coordinate with WVDOH to ensure proper permitting regarding debris removal. Work with the WVDOH to expand its tire amnesty program. Inform the public of appliance pick-up ordinance	November 2016	November 2021	County Commission	FCOES	Public Education and Awareness	Should not require additional funding. Code enforcement may require some administrative costs	Local Funds
Status: On-going.										
Fayette 9	Flooding	4	Identify undersized and inadequate culverts and correct the problem	November 2016	November 2021	County Commission	Municipal Councils	Structural Projects	No additional funding necessary	Local Funds
Status: On-going.										
Fayette 10	Flooding	1	Study wastewater issues related to flooding, storm water, and public health	November 2016	November 2021	Fayette County Health Department	FCOES	Prevention	$5,000 - $8,000 Contingent on use of consultants	CDBG, PDM
Status: On-going.										
Fayette 11	Flooding	1	Continue to buy both repetitive and non-repetitive loss properties in flood prone areas	November 2016	November 2021	County Commission	County Floodplain Coordinator	Prevention	Approx. $50,800 per structure	HMPG, NRCS
Status: On-going. There have been 240 buyouts since the last update. Funds are still available, but not looking to buy any more at this time.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Fayette 12	Flooding	1	Work toward meeting the requirements for participation in the Community Rating System (CRS)	November 2016	November 2021	County Commission	County Floodplain Coordinator	Public Education and Awareness	Cost met by currently budgeted funds	Local Funds
Status: On-going.										
Fayette 13	Flooding	1	Undertake buy out projects in Dunloup Watershed areas (i.e. the Dunloup Watershed Voluntary Buyout Program)	November 2016	November 2021	FCOES	WVDHSEM; NCRS	Prevention	Up to $50,800 per house, up to 50 properties. Up to $2,540,000 total	HMPG, NRCS
Status: On-going.										
Fayette 14	Mass Movement	11	Ensure enforcement and investigate possibility of enhancing Risk Management Plans (RMPs) for logging, mining, and gas operations	November 2016	November 2021	County Commission	FCOES, WV State Fire Marshal (WVSFM), WVDEP, and private entities	Emergency Services	Costs will be absorbed by the private sector agencies involved	Local Funds
Status: On-going.										
Fayette 15	Mass Movement	13	Conduct regular inspection of earthen impoundments with required reporting. Doing so may require coordination with property owners.	November 2016	November 2021	WVDEP	N/A	Prevention	Already regular budget line items	Local Funds
Status: On-going.										
Fayette 16	Mass Movement	12	Work with WVDOH to identify and prioritize areas prone to recurring slides. Develop plans to reduce risk and occurrence.	November 2016	November 2021	County Commission	WVDOH	Structural Projects	$1,000 - $3,000 each, contingent on the use of consultants	WVDOH, Local Funding
Status: On-going.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Fayette 17	Mass Movement	14	Work with the WVDOH to develop Memorandum of Understanding (MOU) with mining companies and contractors to clear impacted roadways	November 2016	November 2021	County Commission (as point of contact only)	WVDOH, Private Entities	Emergency Services	No additional funding needed	Local Funds
Status: On-going.										
Fayette 18	Thunderstorms, Winter Storms Wind	6	Reduce the impact to citizens due to power loss during severe storm events by investigating the feasibility of backup power for citizens in a special needs registry	November 2016	November 2021	FCOES	N/A	Emergency Services	No additional funding needed	Local Funds
Status: On-going.										
Fayette 19	Thunderstorms, Winter Storms Wind	14	Reduce the impact of conventional communications by developing a local radio network (Citizen Band [CB] and amateur radio) and by promoting knowledge and training in this arena. Members can serve as contact points during hazard events.	November 2016	November 2021	FCOES	Local Emergency Planning Committee (LEPC)	Emergency Services	Up to $5,000	HMEP, Local Funding
Status: On-going.										
Fayette 20	Hazardous Materials	16	Support the LEPC in the development of a commodity flow plan	November 2016	November 2021	LEPC	FCOES	Emergency Services	Up to $7,000	Hazardous Materials Emergency Planning (HMEP)
Status: On-going.										
Fayette 21	Hazardous Materials	16	Increase oversight of hazardous chemicals within, used, and stored in Fayette County	November 2016	November 2021	LEPC	FCOES, WVDHSEM	Emergency Services	Little to no additional funding	Local Funds
Status: On-going.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Fayette 22	Hazardous Materials	1	Enhance public awareness	November 2016	November 2021	FCOES	LEPC	Public Education and Awareness	Up to $2,500	PDM, HMEP, EMPG, Local funding
Status: On-going.										
Fayette 23	Misc.	3	Develop early warning and alert system	November 2016	November 2021	FCOES	LEPC	Emergency Services	Up to $100,000	HSGP
Status: On-going. The county has begun utilizing the NIxle mass warning system and will continue to promote enrollment.										
Fayette 24	Misc.	3	Develop a special needs registry for home bound/non-ambulatory and citizens with special physical or medical needs. Entry on registry ensures check in during hazards and special attention	November 2016	November 2021	FCOES	WVDHSEM, WV 2-1-1	Emergency Services	Unknown	Local Funds
Status: On-going.										
Fayette 25	Misc.	2	Develop a more in-depth county asset list to better understand the value of structures within the county	November 2016	November 2021	County Commission	FCOES	Emergency Services	Part of regular operations	Local Funds
Status: On-going.										
Fayette 26	Misc.	6	Replacing powerlines and poles around the county.	November 2016	November 2021	Service Electric	AEP	Structural Mitigation	Being handled by AEP	N/A
Status: New. This project is already in progress but was not included in the past HMP update. The project is being handled by Service Electric and paid for by AEP.										
Fayette 27	Misc.	2	Undertake Source Water Protection Planning measures following state guidelines	November 2016	November 2021	Municipal Water Providers, Local PSDs		Prevention		Local Funds
Status: New. This project has been started, but was not included in the prior HMP update.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Ansted 1	Flooding	1	Identify undersized and inadequate culverts and correct the problem	November 2016	November 2021	Municipal Council	Engineering Consultants, Town Employees, Region 4 PDC	Structural Projects	Identifying has little to no cost. Fixing cost up to and in excess of $1,000,000	Community Development Block Grant (CDBG)
Status: On-going. Town continues to remove, replace and repair existing culverts as funds are available applying rules documented in the Comprehensive Land Use and Zoning Plan (see Project 2B.1.1) Several culverts have been replaced and upgraded funded in part by the 2015 and 2016 Flood declarations and FEMA supported activities. To date there have been no Community Development Grants secured specifically for flooding issues for the town.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Fayetteville 1	Flooding	1	Identify undersized and inadequate culverts and correct the problem	November 2016	November 2021	Municipal Council	Engineering Consultants, Town Employees, Region 4 PDC	Structural Projects	Identifying has little to no cost. Fixing cost up to and in excess of $1,000,000	Community Development Block Grant (CDBG)
Status: On-going										
Fayetteville 2	N/A	2	Develop more in depth municipal asset list to better understand the value of structures within the town	November 2016	November 2021	Municipal Council	FCOES	Emergency Services	Part of regular operations	Local Funds
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Gauley Bridge 1	N/A	1	Develop more in depth municipal asset list to better understand the value of structures within the town	November 2016	November 2021	Municipal Council	FCOES	Emergency Services	Part of regular operations	Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Meadow Bridge 1	N/A	1	Develop more in depth municipal asset list to better understand the value of structures within the town	November 2016	November 2021	Municipal Council	FCOES	Emergency Services	Part of regular operations	Local Funding
Status: On-going. Municipal representatives believed this to be a valid project, necessary on an on-going basis to ensure an accurate list of municipal assets exists for the town's planning considerations.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Montgomery 1	Flooding	1	Identify undersized and inadequate culverts and correct the problem	November 2016	November 2021	Municipal Council	Engineering Consultants, Town Employees, Region 4 PDC	Structural Projects	Identifying has little to no cost. Fixing cost up to and in excess of $1,000,000	Community Development Block Grant (CDBG)
Status: On-going										
Montgomery 2	N/A	2	Develop more in depth municipal asset list to better understand the value of structures within the town	November 2016	November 2021	Municipal Council	FCOES	Emergency Services	Part of regular operations	Local Funds
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Mount Hope 1	Flooding	1	Identify undersized and inadequate culverts and correct the problem	November 2016	November 2021	Municipal Council	Engineering Consultants, Town Employees, Region 4 PDC	Structural Projects	Identifying has little to no cost. Fixing cost up to and in excess of $1,000,000	Community Development Block Grant (CDBG)
Status: On-going										
Mount Hope 2	N/A	2	Develop more in depth municipal asset list to better understand the value of structures within the town	November 2016	November 2021	Municipal Council	FCOES	Emergency Services	Part of regular operations	Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Oak Hill 1	Flooding	1	Identify undersized and inadequate culverts and correct the problem	November 2016	November 2021	Municipal Council	Engineering Consultants, Town Employees, Region 4 PDC	Structural Projects	Identifying has little to no cost. Fixing cost up to and in excess of $1,000,000	Community Development Block Grant (CDBG)
Status: On-going										
Oak Hill 2	N/A	2	Develop more in depth municipal asset list to better understand the value of structures within the town	November 2016	November 2021	Municipal Council	FCOES	Emergency Services	Part of regular operations	Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pax 1	Misc	4	Develop more in depth municipal asset list to better understand the value of structures within the town	November 2016	November 2021	Municipal Council	FCOES	Emergency Services	Part of regular operations	Local Funds
Status: On-going										
Pax 2	Flooding	3	Relocation of Town Hall from flood plain location to the former Pax elementary school building complex and establish the former gym into a community center/ disaster relief shelter.	November 2016	Sept. 2017	Mayor, Town Council	Fayette County Commission, Fayette County Building Authority	Structural, Prevention	$250,000	Request funds from granting agencies with additional funds supplementing from the General Fund
Status: New. This project is in the early stages. Inspection of the property has been performed. Proceedings are taking place to transfer property to the Town of Pax from the Pax Reunion Committee.										
Pax 3	Flooding	1	Establish an early warning system for flood waters to alert residents by signal of high water and possible flooding.	July 2016	June 2018	Mayor, Town Council	WVDOT, Fayette County Commission, Fayette County Building Authority	Public education and awareness	Unknown	HMGP, PDM, Other Grant programs
Status: New. This project is in the early planning stages which are at this point being conducted by the town. Costs are not yet figured.										
Pax 4	Flooding	2	Establish an Emergency Access/ Evacuation Road through town to isolated areas during flooding events or other hazards.	July 2016	June 2019	Mayor, Town Council	WVDOT	Structural	Unknown	HMGP, PDM, Other Grant programs
Status: New. This project is in the early planning stages. Supporting agencies are being contacted for information.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Smithers 1	Flooding	1	Identify undersized and inadequate culverts and correct the problem	November 2016	November 2021	Municipal Council	Engineering Consultants, Town Employees, Region 4 PDC	Structural Projects	Identifying has little to no cost. Fixing cost up to and in excess of $1,000,000	Community Development Block Grant (CDBG)
Status: On-going										
Smithers 2	N/A	2	Develop more in depth municipal asset list to better understand the value of structures within the town	November 2016	November 2021	Municipal Council	FCOES	Emergency Services	Part of regular operations	Local Funds
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Thurmond 1	Misc	1	Develop more in depth municipal asset list to better understand the value of structures within the town	November 2016	November 2021	Municipal Council	FCOES	Emergency Services	Part of regular operations	Local Funding
Status: On-going. The U.S. Park Service has bought all but the town hall and the water plant.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Greenbrier 1	Flooding	33	Continue to work with the WVDOH to design road construction to be at the 100 year base flood elevation or higher	November 2016	November 2021	WVDOH, Local Division	N/A	Structural Projects	Up to $5,000,000 per project	WVDOH
Status: On-going										
Greenbrier 2	Flooding	25	Maintain a database of all at risk structures in floodways and floodplains and distribute information to homeowners and businesses on the importance of purchasing flood insurance and flood proof techniques to protect their homes and businesses	November 2016	November 2021	Greenbrier County Floodplain Manager	Municipal Public Works Departments, GCEMA	Prevention	Should not require significant additional funds	Local Funding
Status: On-going										
Greenbrier 3	Flooding	16	Establish an ongoing project of mitigation training for public officials and private businesses as well as the citizens of Greenbrier County	November 2016	November 2021	Greenbrier County Floodplain Manager	Municipal Public Works Departments, GCEMA	Public Education and Awareness	Should require little to no additional funding	Local Funding
Status: On-going										
Greenbrier 4	Flooding	6	Continue to make informational pamphlets available to Greenbrier County citizens that promote buying flood insurance	November 2016	November 2021	Greenbrier County Floodplain Manager	N/A	Prevention	Should require no additional funding	Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Greenbrier 5	Flooding	11	Continue to make permitting necessary (that is consistent with local floodplain ordinances) before any new construction is allowed.	November 2016	November 2021	Greenbrier County Floodplain Manager	Greenbrier County Commission	Prevention	Already budgeted	Local Funding
Status: On-going										
Greenbrier 6	Flooding	31	Determine feasibility of floodwalls or other structures to protect water treatment facilities from flooding	November 2016	November 2021	Municipal Public Works Departments, PSDs, Floodplain Manager	Municipal Councils, County Commission, Region 4 PDC	Structural Projects	Approx. $5,000 to $50,000+	HMGP, U.S. Army Corps of Engineers (USACE), CDBG, Local Funding
Status: On-going										
Greenbrier 7	Flooding	29	Determine feasibility of floodwalls or other structures to protect wastewater treatment facilities from flooding	November 2016	November 2021	Municipal Public Works Departments, PSDs, Floodplain Manager	Municipal Councils, County Commission, Region 4 PDC	Structural Projects	Approx. $5,000 to $50,000+	HMGP, USACE, CDBG, Local Funding
Status: On-going										
Greenbrier 8	Flooding	22	Provide opportunities for the leaders in Greenbrier County to participate in FEMA (and/or other agency) proactive programs	November 2016	November 2021	Greenbrier County Floodplain Manager	GCEMA	Public Education and Awareness	Should not require significant additional funding	Local Funding
Status: On-going										
Greenbrier 9	Flooding	7	Continue to apply for HMPG funds for acquisitions, elevations, or relocations of identified at risk, repetitive loss, non-repetitive loss, or substantial damaged properties in Greenbrier County	November 2016	November 2021	GCEMA	Greenbrier County Commision, Greenbrier County Floodplain Manager	Prevention	Approx. $71,300 per purchase	HMPG
Status: On-going. 15 properties have been acquired since the last HMP update and 58 have been acquired in total. The County does not currently distribute funds for elevation projects but the program is now changing to include elevation and mitigation reconstruction.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Greenbrier 10	Winter Weather	25	Continue to enhance and upgrade current snow removal capabilities throughout the county	November 2016	November 2021	WV DOH, Dept of Transportation	City Maintenance Personnel	Emergency Services	Up to $50,000 per equipment purchase	Local/State Funding
Status: On-going based on DOH and city/town budgetary issues										
Greenbrier 11	Winter Weather	24	Develop and implement programs to coordinate mitigation activities to reduce risk to public infrastructure from severe storms	November 2016	November 2021	Utility companies and PSD's	GCEMA	Prevention	Requires no additional funding	Local Funding
Status: On-going. Generator installations, portable generator availability, underground wiring										
Greenbrier 12	Winter Weather	11	Increase public awareness of the severe storm mitigation activities that the public can undertake.	November 2016	November 2021	GCEMA	Greenbrier County LEPC	Public Education and Awareness	Up to $2,500 for the production and development of materials	PDM, EMPG, SERC, Local Funding
Status: On-going. Public information, Public Service Announcements										
Greenbrier 13	Winter Weather	4	Promote enrollment in the County Mass Notification System (WENS)	November 2016	November 2021	GCEMA	National Weather Service (NWS)	Public Education and Awareness	Should require little to no additional funding	Local Funding
Status: On-going.										
Greenbrier 14	Winter Weather	19	Map and publicize locations around the county that have the highest incidences of extreme storms	November 2016	November 2021	GCEMA	Greenbrier County LEPC	Public Education and Awareness	Should require little to no additional funding	Local Funding
Status: On-going. These are updated with each Hazard Mitigation Plan update.										
Greenbrier 15	Winter Weather	32	Encourage/recommend electrical utilities to use underground construction methods where possible to reduce power outages from severe storms.	November 2016	November 2021	Greenbrier County Planning	Utility Companies	Prevention	Should require little to no additional funding	Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Greenbrier 16	Winter Weather	27	Encourage/recommend improved building materials and techniques when rebuilding damaged property	November 2016	November 2021	Greenbrier County Commission, Planning Dept.	Greenbrier County Planning, Region 4 PDC	Prevention	Should require little to no additional funding	Local Funding
Status: On-going										
Greenbrier 17	Thunderstorms	2	Continue to coordinate with Blacksburg NWS office on a daily basis to improve readiness for imminent severe weather	November 2016	November 2021	GCEMA	NWS	Public Education and Awareness	Little to no funding	Local Funding
Status: On-going										
Greenbrier 18	Thunderstorms	1	Coordinate warning system with the Greenbrier County Board of Education to enhance protection of students and faculty under threat of severe weather	November 2016	November 2021	GCEMA	Greenbrier County Board of Education	Public Education and Awareness	No additional funding	Local Funding
Status: On-going. The Greenbrier BOE is enrolled in the County Mass Notification System and has been provided weather radios										
Greenbrier 19	Drought	29	Implement a water study and analyze the data to better help citizens during periods of drought	November 2016	November 2021	Greenbrier County Planning	GCEMA, Region 4 PDC	Natural Resource Protection	Up to $50,000 if contractor is used	CDBG, PDM, Local Funding
Status: On-going										
Greenbrier 20	Drought	17	Identify and maintain backup water supplies for citizens	November 2016	November 2021	PSDs, water systems, municipalities	GCEMA	Prevention	Should require little to no additional funding	Local Funding
Status: On-going										
Greenbrier 21	Misc.	16	Coordinate with the power company to clear trees and other debris from electric lines throughout the county	November 2016	November 2021	Utility companies-AEP and First Energy		Prevention	Should require little to no additional funding	Local Funding

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Status: On-going										
Greenbrier 22	Misc.	20	Develop a database of special needs populations which require electric power for life support equipment	November 2016	November 2021	GCEMA	Committee on Aging, Health Clinics	Emergency Services	Should require little to no additional funding	Local Funding
Status: On-going										
Greenbrier 23	Misc.	15	Install repeaters as needed and maintain emergency generators at tower sites.	November 2016	November 2021	GCEMA/911 Center		Emergency Services	Up to $50,000 depending on generator	HSGP, Local Funding thru 911 Funds
Status: On-going. All tower sites have generators, but replacements will be needed based upon age of each unit.										
Greenbrier 24	Hazmat	7	Conduct commodity flow studies to define the types and quantities of materials present or transiting through the county	November 2016	November 2021	Greenbrier County LEPC	GCEMA	Emergency Services	Up to $5,000 if contractor is used.	HMEP
Status: On-going. Commodity Flow study updated and completed in 2015										
Greenbrier 25	Hazmat	7	Work with the Regional Response Team and county response team(s) to provide a fast and effective response to an incident	November 2016	November 2021	GCEMA, WVDHSEM	WV State Fire Marshal, SERC	Emergency Services	Partially funded currently but may not continue	WVDHSEM SERC
Status: On-going. Hazmat supplies have been provided to all County VFD's										
Greenbrier 26	Misc.	20	Coordinate with assets in the county to more effectively estimate losses from a disaster	November 2016	November 2021	GCEMA	Critical Facilities	Prevention	May require additional funding	Local Funding
Status: On-going.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Greenbrier 27	Dam Failure	18	Maintain a partnership with parties that are stakeholders in the monitoring and general condition of dams throughout Greenbrier County. Provide technical and manpower support to evaluate the status of these dams and report to the Core Planning Team on a yearly basis.			WV Conservation Agency	WVDEP GCEMA	Prevention	Should require little to no additional funding	
Status: On-going.										
Greenbrier 28	Misc.	5	Purchase and install generators at emergency shelter sites (some of which co-exist with fire departments) and critical facilities.			GCHSEM	Greenbrier County Commission	Emergency Services	Up to $80,000 per installation	HMGP funds
Status: On-going. The project was not included in the prior HMP update but has been initiated within that cycle. One generator has been installed thru HMGP funding for a county shelter and one for the emergency shelter in the Town of Alderson. Three more applications have been submitted for shelters.										
Greenbrier 29	Misc.	23	Replacing powerlines and poles in AEP service areas in the county.			Service Electric	AEP	Structural Mitigation	Being handled by AEP	N/A
Status: On-going. This project is already in progress but was not included in the past HMP update. The project is being handled by Service Electric and paid for by AEP.										
Greenbrier 30	Misc.	11	Undertake Source Water Protection Planning measures following state guidelines			Municipal Water Providers, Local PSDs	GCHSEM	Prevention	Unknown	
Status: On-going. This project is already in progress but was not included in the past HMP update.										
Greenbrier 31	Misc.	11	Purchase and install generators at Critical Infrastructure locations to mitigate shutdowns due to extensive power outages			Municipal Water/WWTP Providers, Town Halls	GCHSEM, WVDHSEM	Prevention	Unknown	HMGP funds
Status: New. Applications have been submitted for HMGP funding										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Greenbrier 32	Misc.	3	Purchase and install an Emergency Alert system for the State Fair of West Virginia due to the large public attendance and weather risks over an extensive unprotected area.			State Fair of West Virginia	GC HSEM, WVDHSEM	Prevention, Public Information and Awareness	Unknown	Homeland Security Funding
Status: New. Application has been submitted for Homeland Security funding.										
Greenbrier 33	Flooding	7	Install additional river or stream gauges in high risk areas to gather critical flood data and provide rapid notification to residents, possibly by the installation of sirens or other alert methods.			WVDHSEM	GCHSEM	Prevention, Public Information and Awareness	Unknown	WVDHEM, Hazard Mitigation funds
Status: New. Discussions have taken place regarding the locations needed, but requests have not been submitted yet.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Alderson 1	Flooding	1	Investigate and implement strategies to reduce flood damage and loss in the Town of Alderson, including but not limited to acquisitions, elevations and relocations of flood prone properties.	November 2016	November 2021	Alderson Floodplain Manager	Greenbrier County Floodplain Manager, Greenbrier County Emergency Management Agency (GCEMA)	Structural Projects	Depends on the projects being undertaken.	HMPG, Local Funding
Status: On-Going**.** Efforts to rehabilitate and dredge the Monroe County Creek were hindered by logistical, permitting and planning issues. Recent events may create an opportunity to acquire the one Repetitive Loss property in Alderson.										
Alderson 2	Flooding	2	Study the feasibility of installing backflow prevention devices on outlets of storm drains that drain into the river.	November 2016	November 2021	Alderson City Council		Prevention	No additional funding to study feasibility	Local Funding
Status: New										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Lewisburg 1	Drought	1	Identify and maintain backup water supplies to make water available to citizens	November 2016	November 2021	Lewisburg Public Works	GCEMA	Prevention	Should require little to additional funding	Local Funding
Status: On-going.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Quinwood 1	Misc.	1	Develop and distribute information to the town's critical facilities describing the proper policies and procedures to be conducted in the event of a bomb threat.	November 2016	November 2021	Quinwood Town Council	GCEMA	Public Education and Awareness	No additional funds should be required	Local Funding
Status: On-going. Town representatives believe this project to be worthy of inclusion and elected to list it as on-going, even though it had not been completed in the previous plan cycle.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Rainelle 1	Drought	2	Identify and maintain backup water supplies to make water available to citizens	November 2016	November 2021	Greenbrier County PSD #2	Rainelle Town Council, GCEMA	Prevention	Little to no additional funding	Local Funding
Status: On-Going.										
Rainelle 2	Misc.	1	Purchase and install generators at critical facilities.	November 2016	November 2021	Rainelle Town Council	GCEMA	Structural	Up to $80,000 per installation	HMGP
Status: New. The project was not included in the prior HMP update but has been initiated within that cycle. Three applications have been submitted for HMGP funds.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Renick 1	Wildfire	1	Distribute an informational brochure including information on the burning ban and the leading causes of wildfires, as well as steps the general public can take to avoid starting wildfires	November 2016	November 2021	Renick Town Council	GCEMA, Greenbrier County LEPC	Public Education and Awareness	Up to $2,500	PDM, Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Ronceverte 1	Misc.	1	Purchase and install generators at critical facilities.	November 2016	November 2021	Ronceverte City Council	Greenbrier County Homeland Security and Emergency Management	Structural	Up to $80,000 including installation.	HMGP
Status: New. The project was not included in the prior HMP update but has been initiated within that cycle. One application for HMGP funds has been submitted										
Ronceverte 2	Flooding	2	Take steps to address flooding due to storm water.	November 2016	November 2021	Ronceverte City Council	FEMA	Flood Mitigation	Unknown at this time	FEMA, DOH
Status: New. This plan is in the Initial planning stages. This was not included in the prior HMP update but was begun within the plan's life cycle.										
Ronceverte 3	Flooding	3	Coordinate with the Army Corps of Engineers Flood Wall Project to implement it for Ronceverte	November 2016	November 2021	Ronceverte City Council	Army Corps Region 4	Flood Mitigation	$54 Million	Army Corps, FEMA, WV Infrastructure, Congressional Allocation
Status: New. A letter has been send to the Corps of Engineers to begin the project. This was not included in the prior HMP update but was begun within the plan's life cycle.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Rupert 1	Flooding	2	Continue to apply for HMGP funds for acquisitions, elevations, or relocations of the three (3) identified repetitive loss properties in Rupert	November 2016	November 2021	Rupert Floodplain Manager	Greenbrier County Floodplain Manager, GCEMA	Structural Projects	Approx. $71,300	HMPG
Status: On-going.										
Rupert 2	Misc.	1	Purchase and install generators at critical facilities.	November 2016	November 2021	Rupert Town Council	GCEMA	Structural	Up to $80,000, including installation	HMGP
Status: New. The project was not included in the prior HMP update but has been initiated within that cycle. One generator application has been submitted.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
WSS1	Hazmat	2	Make the public aware of the hazardous materials risk, what they can do it a spill occurs, and stress the importance of evacuation planning	November 2016	November 2021	Greenbrier County LEPC	White Sulphur Springs Fire Department, GCEMA	Public Education and Awareness	Up to $2,500	PDM, Local Funding
Status: On-going.										
WSS2	Misc.	1	Purchase and install generators at critical facilities.	November 2016	November 2021	White Sulphur Springs City Council	GCEMA	Structural	Up to $80,000 including installation	HMPG
Status: On-Going. The project was not included in the prior HMP update but has been initiated within that cycle. One generator application has been submitted.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Nicholas 1	Misc.	10	Purchase and re-distribute the booklet *Getting Ready: A Family Emergency Guide* prepared by the State of West Virginia	November 2016	November 2021	Nicholas County Office of Emergency Services (NCOES)		Public Education and Awareness	Little to no cost	Local Funding
Status: On-going.										
Nicholas 2	Flooding	1	Continue to review and update floodplain ordinances to regulate development within the 100 year flood plain. Make sure the public is aware of requirements in the ordinances.	November 2016	November 2021	NCOES	Nicholas County Commission	Prevention	No significant additional funding	Local Funding
Status: On-going.										
Nicholas 3	Flooding	2	Continue to train and re-certify the county Floodplain Coordinator to assist citizens in complying with the floodplain ordinances	November 2016	November 2021	NCOES		Public Education and Awareness	No significant additional funding	Local Funding
Status: On-going.										
Nicholas 4	Flooding	11	Continue to update the GIS data later of flood maps on the county mapping database to identify floodplain areas of Nicholas County.	November 2016	November 2021	NCOES	Nicholas County Assessor	Public Education and Awareness	Little to no funding required	Local Funding
Status: On-going.										
Nicholas 5	Flooding	8	Continue working with municipalities to update floodplain ordinances adopted prior to 1987	November 2016	November 2021	NCOES		Prevention	Little to no funding required	Local Funding
Status: On-going.										
Nicholas 6	Flooding	2	Continue training the county and municipal development officials on NFIP requirements	November 2016	November 2021	NCOES			Little to no funding required	Local Funding
Status: On-going.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Nicholas 7	Flooding	4	As funds become available, undertake buyout and/or elevation projects to lessen the number of repetitive loss properties	November 2016	November 2021	NCOES		Prevention	Little to no funding required	Local Funding
Status: On-going.										
Nicholas 8	Misc.	11	Continue to review all comprehensive plans to ensure that designated growth areas are no in hazard areas. If they are, build mitigation measures into development plans	November 2016	November 2021	NCOES	Nicholas County Economic Development, Region 4 PDC	Prevention	Little to no funding required	Local Funding
Status: On-going.										
Nicholas 9	Misc.	8	Continue to review all capital improvement plans to ensure that infrastructure improvements are not directed towards hazardous areas. If they are, build mitigation measures into plans	November 2016	November 2021	NCOES	Nicholas County Economic Development, Region 4 PDC	Prevention	Little to no funding required	Local Funding
Status: On-going.										
Nicholas 10	Misc.	4	Coordinate with county emergency services personnel to participate in exercises of simulated biological and hazardous materials incidents to practice response efforts	November 2016	November 2021	NCOES	Nicholas County LEPC	Emergency Services	Up to $10,000 if a contractor is used	EMPG, SHSG, HMEP, SERC, Local Funding
Status: On-going.										
Nicholas 11	Misc.	13	Maintain updates to plans that detail specific actions to be taken when weather events such as ice, snow, flooding, and etc. strike. Plans should include who is responsible for such actions	November 2016	November 2021	NCOES	Nicholas County LEPC, Emergency Services Providers	Emergency Services	Up to $5,000 apiece if a contractor is used	EMPG, SHSG, HMEP, SERC, Local Funding

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Status: On-going.										
Nicholas 12	Misc	4	Purchase and install permanent generators for critical facilities	November 2016	November 2021	NCOES		Structural	Up to $80,000, including installation	HMGP
Status: New.										
Nicholas 13	Misc.	4	Purchase mobile generators and install hookups for these generators at critical facilities.	November 2016	November 2021	NCOES		Structural	Up to $80,000, including installation	EMPG, PDM, Local Funding
Status: New										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Richwood 1	Misc.	1	Continue to review all community and economic development plans to ensure that designated growth areas are not in hazard areas. If they are, build mitigation measures into plans	November 2016	November 2021	Town Council	Region 4 PDC, Nicholas County Economic Development, Nicholas County Commission	Prevention	Little to no funding required	Local Funding
Status: On-going.										
Richwood 2	Flooding	2	Raise Route 39 from Go-Mart to Bridge Ave.	November 2016	November 2021	Town Council	WVDOT	Structural	Unknown at this time	HMGP, State funding, local funding
Status: New										
Richwood 3	Severe Weather	3	Bury Utility lines	November 2016	November 2021	Town Council	Local Power Company	Structural	Unknown at this time	Local Funding, Local service providers
Status: New										
Richwood 4	Misc.	4	Develop Emergency Response Plan Police/Fire/Etc.	November 2016	November 2021	Town Police/Fire Chiefs	Town Council	Emergency Services	Little to no additional funding	Local Funding
Status: New										
Richwood 5	Misc.	5	Develop Green spaces into parks/ playgrounds/ Fair grounds/ fitness trails/Etc.	November 2016	November 2021	Town Council	WVDEP	Natural Resource Protection	Unknown at this time	Local Funding
Status: New										
Richwood 6	Flooding	6	Work to restore Stream Corridors	November 2016	November 2021	Town Council		Prevention	Unknown at this time	HMGP, state funding, local funding
Status: New										
Richwood 7	Flooding	7	Separate Storm Water / Sewer systems	November 2016	November 2021	Town Council		Prevention	Unknown at this time	HMGP
Status: New										
Richwood 8	Flooding	8	Relocate Wastewater Treatment Plant out of the floodplain.	November 2016	November 2021	Town Council		Structural	Unknown at this time	HMGP
Status: New										
Richwood 9	Misc.	9	Install fixed generators at critical facilities	November 2016	November 2021	Town Council		Structural	Up to $80,000 including installation.	HMGP

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Status: New										
Richwood 10	Flooding	10	Construct Flood Walls/Dykes/Abatements where needed and feasible	November 2016	November 2021	Town Council		Property Protection	Unknown at this time	HMGP
Status: New										
Richwood 11	Flooding	11	Periodically clear local rivers of debris and other impediments.	November 2016	November 2021	Town Council		Prevention; Natural Resource Protection	Unknown at this time	Local funding
Status: New										
Richwood 12	Flooding	12	Repair as needed those sidewalks that serve as retaining walls.	November 2016	November 2021	Town Council		Prevention; Structural	Unknown at this time	HMGP, local funding
Status: New										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Summersville 1	Hail, Thunderstorms, Tornados, Wind, Winter Storms	1	Continue to coordinate with the National Weather Service on a daily basis to monitor imminent severe weather.	November 2016	November 2021	Mayor City Recorder City Council Chief of Police Staff Designees	NCOES	Public Awareness	No significant additional funding.	Local Funding
Status: New										
Summersville 2	Misc	2	Develop written policies to define goals, mitigate impacts of natural disasters and establish long term goals.	November 2016	November 2021	Local Citizens Mayor City Recorder City Council Planning Commission	NCOES	Emergency Services	No significant additional funding.	Local Funding
Status: New										
Summersville 3	Hail, Thunderstorms, Tornados, Wind, Winter Storms	3	Coordinate any warning system with the Nicholas County Board of Education to enhance protection to students and faculty under threat of severe weather.	November 2016	November 2021	Mayor City Recorder Chief of Police (NCBOE) Staff Designees	NCOES	Public Awareness	No significant additional funding.	Local Funding
Status: New										
Summersville 4	Misc.	4	Continue to improve mitigation training and provide public information to the citizens of Summersville and surrounding areas before, during and after emergency incidents.	November 2016	November 2021	Mayor City Recorder Chief of Police SCTV Local Radio Staff Designees	NCOES	Public Awareness and Education	No significant additional funding.	Local Funding
Status: New										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Summersville 5	Flooding	5	Continue to train and recertify the City's Floodplain Coordinator to assist citizens in complying with the floodplain ordinance.	November 2016	November 2021	Summersville Floodplain Manager Summersville Code Official	NCOES	Prevention	No significant additional funding	Local Funding
Status: On-going. The city felt that ensuring its floodplain coordinator is current with the latest regulations would be a benefit to the town.										
Summersville 6	Flooding	6	Continue to keep local ordinances and codes updated and enforce the regulations consistent with current laws.	November 2016	November 2021	Summersville Floodplain Manager Summersville Code Official	NCOES	Prevention	No significant additional funding.	WV Flood Maps WV Building Code
Status: New										
Summersville 7	Flooding	7	Continue to encourage and recommend building with proper flood resistant construction techniques.	November 2016	November 2021	Summersville Floodplain Manager Summersville Code Official	NCOES	Prevention	No significant additional funding	WV Building Code Engineered Design Standards
Status: New										
Summersville 8	Winter Weather	8	Continue to maintain and upgrade current snow removal capabilities throughout the City.	November 2016	November 2021	Mayor City Recorder City Council City Staff	NCOES	Emergency Services	No significant additional funding.	Local Funding
Status: New										
Summersville 9	Wind	9	Continue to develop programs to keep trees from threatening lives, property and infrastructure during severe windy weather.	November 2016	November 2021	Mayor City Recorder City Council City Forestry Council	NCOES Mon. Power Company	Prevention	No significant additional funding.	Local Funding
Status: New										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Summersville 10	Hazardous Materials	10	To coordinate with City / County First Responders for training exercises of simulated chemical / hazardous materials incidents.	November 2016	November 2021	Mayor City Recorder City Council City Police City Fire Dept.	NCOES WVSP NCSD EMS HAZ. MAT. TEAM	Emergency Services	No significant additional funding	Local Funding
Status: New										
Summersville 11	Misc.	11	Continue to identify and install back-up power to tower sites and special needs locations.	November 2016	November 2021	Mayor City Recorder City Council Planning Commission	NCOES	Structural projects	No significant additional funding	Local Funding
Status: New										
Summersville 12	Misc.	12	Continue to provide emergency shelters at the Nicholas County Senior Center and SVFD.	November 2016	November 2021	Mayor City Recorder City Council City Staff Designees	NCOES	Emergency Services	No significant additional funding	Local Funding
Status: New										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 1	Flooding	3	Review and update floodplain ordinances to ensure full compliance with National Flood Insurance Program (NFIP) standards.	November 2016	November 2021	Pocahontas County Floodplain Manager	Pocahontas County Commission, PCOEM	Prevention	Enforcement may require funding	Local Funding
Status: On-going										
Pocahontas 2	Flooding	3	Educate local government representatives about the NFIP and its requirements. This project may include the facilitation of public forums to encourage questions regarding the NFIP.	November 2016	November 2021	Pocahontas County Floodplain Manager	Pocahontas County Commission, PCOEM	Public Education and Awareness	Little to no additional funding	Local Funding
Status: On-going										
Pocahontas 3	Flooding	1	Coordinate with appropriate agencies to obtain updated NFIP{ policy-holder information within Pocahontas County	November 2016	November 2021	Pocahontas County Floodplain Manager	Pocahontas County Commission, PCOEM	Prevention	Little to no additional funding	Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 4	Flooding	4	Coordinate with FEMA to maintain an updated list of repetitive loss properties throughout Pocahontas County and the municipalities therein	November 2016	November 2021	Pocahontas County Floodplain Manager	PCOEM	Prevention	Little to no additional funding	Local Funding
Status: On-going. Originally completed during the last hazard mitigation cycle, local officials elected to keep it in the plan to demonstrate the importance of maintaining current information.										
Pocahontas 5	Flooding	5	Input repetitive loss properties into a GIS database for use in future mitigation activities	November 2016	November 2021	PCOEM	WVDHSEM, FEMA	Prevention	Should not require significant additional funding	Local Funding
Status: On-going										
Pocahontas 6	Flooding	9	As funds become available, undertake buyout and/or elevation projects to lessen the number of repetitive loss properties. This project also includes non-RL properties. As part of this process, hold a series of public meetings with property owners to identify specific project areas and to gauge interest in project participation	November 2016	November 2021	Pocahontas County Floodplain Manager	Pocahontas County Commission, PCOEM	Prevention	Approx. $64,000 per purchase	HMPG
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 7	Flooding	2	Coordinate with WVDOH to repair or install culverts in an effort to alleviate backup onto roads during high volume rain incidents	November 2016	November 2021	PCOEM	Municipal Town Councils	Emergency Services	Requires little to no additional funding	Local Funding
Status: On-going										
Pocahontas 8	Drought	8	Develop a portable bulk water system that can be moved where it is needed during severe drought conditions	November 2016	November 2021	PCOEM	WVDOH	Emergency Services	Requires little to no additional funding	Local Funding
Status: On-going										
Pocahontas 9	Drought	1	Coordinate with local fire departments to haul water upon request to county residents and facilities	November 2016	November 2021	PCOEM	Local VFDs	Emergency Services	Requires little to no additional funding	Local Funding
Status: On-going. This project has been completed in the past, local officials elected to re-list the project as agreements need regular upkeep.										
Pocahontas 10	Thunderstorms, Tornado, and Wind Events	5	Promote the NWS "Storm Ready" program	November 2016	November 2021	PCOEM	Pocahontas County Commission, NWS	Prevention	Costs may be reimbursable	
Status: On-going										
Pocahontas 11	Wildfires	2	Determine the suitable locations for and consider the installation of dry hydrants throughout the county	November 2016	November 2021	PCOEM	Local VFDs	Emergency Services	Up to $750 per hydrant	U.S. Forest Service
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 12	Mass Movement	1	Work with the WV Division of Forestry to coordinate to promote re-seeding after extraction occurs in the timber industry	November 2016	November 2021	Pocahontas County Commission	WV Division of Forestry	Prevention	Enforcement of new regulations may require funding	WVDOF
Status: On-going										
Pocahontas 13	Winter Weather	8	Coordinate with the DVOH and/or private contractors to ensure that snow can be quickly cleared from major thoroughfares	November 2016	November 2021	PCOEM	WVDOH	Emergency Services	Coordination should not require additional funding	Local Funding
Status: On-going. This project has been completed in the past, local officials elected to re-list the project because of the high probability of winter weather.										
Pocahontas 14	Hazmat	1	Coordinate with local officials and representatives from organizations filing Tier II reports to produce more detailed plans regarding spills and public protective measures	November 2016	November 2021	Local VFDs	Pocahontas County LEPC	Emergency Services	Coordination should not require additional funding	Local Funding
Status: On-going. This project has been completed in the past, local officials elected to re-list the project as facilities may change year to year.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 15	Terrorism	5	Compile a list of potential targets for international terrorism throughout Pocahontas County. This list should include not only sites, but also scenarios. Further, the list should be kept secure	November 2016	November 2021	PCOEM	Pocahontas County LEPC	Emergency Services	Should not require additional funding	Local Funding
Status: On-going. This project has been completed in the past, local officials elected to re-list the project to encourage continuation of these efforts.										
Pocahontas 16	Terrorism	3	Coordinate with local law enforcement providers (and potentially representatives from community assets) to monitor for suspicious persons or groups throughout the county.	November 2016	November 2021	Pocahontas County Sheriff	PCOEM, Municipal Police Departments, WV State Police (WVSP)	Emergency Services	Will not require additional funding	Local Funding
Status: On-going. This project has been completed in the past, local officials elected to re-list the project to encourage continuation of these efforts.										
Pocahontas 17	Misc.	6	Develop an alternative communications plan that utilizes local fire departments and their ability to communicate by radio should telephone service be interrupted.	November 2016	November 2021	Frontier Communications	Local VFDs, Pocahontas County 911, PCOEM	Emergency Services	Little to no additional funding	Local Funding
Status: On-going. This project has been completed in the past, local officials elected to re-list the project to encourage continuation of these efforts as technology changes.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 18	Misc.	1	Coordinate with Frontier Communications as they update their emergency planning to ensure common expectations between the company and local resources during emergency incidents	November 2016	November 2021	Frontier Communications	PCOEM	Emergency Services	No local funding would be necessary	N/A
Status: On-going										
Pocahontas 19	Misc.	1	Inventory residencies and businesses throughout the county utilizing propane for heating. Explain the potential for propane leaks and/or explosions and educate residents/business owners on how to safeguard their assets from damage	November 2016	November 2021	PCOEM	Pocahontas County LEPC	Public Education and Awareness	No significant additional funds should be required	Local Funding
Status: On-going										
Pocahontas 20	Misc.	1	Compile a general list of the types of incidents that could occur in Pocahontas County and result in mass casualties	November 2016	November 2021	Pocahontas Memorial Hospital	PCOAM, Local VFDs	Emergency Services	No additional funds should be required	Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 21	Misc.	5	Enlist local civic organization to assist in the creation of emergency preparedness displays for use in libraries, during festivals or other gathers, civic group meetings, etc. Examples include: Basic hazard Awareness, animals in disaster, business continuity planning, children's safety, and hazard information targeting tourists	November 2016	November 2021	PCOEM	Local 4-H Clubs, Pocahontas County Convention and Visitors Bureau (CVB), Local Businesses, Various Civic Organizations, Farm Bureau, Pocahontas County LEPC	Public Education and Awareness	Up to $200 a piece	Local Funding
Status: On-going										
Pocahontas 22	Misc.	1	Update and maintain a call list to alert business owners and critical facilities of potential threats so that appropriate preventive actions can be taken	November 2016	November 2021	PCOEM	Pocahontas County 911	Emergency Services	No additional funds should be required	Local Funding
Status: On-going. This project has been completed in the past, local officials elected to re-list the project to encourage continuation of these efforts.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 23	Misc.	1	Send pre-canned news releases to media outlets for more rapid dissemination during emergency incidents. Include enough media outlets to ensure coverage of the majority of the county	November 2016	November 2021	PCOEM	Pocahontas County LEPC, Local Media Outlets	Public Education and Awareness	No funding required	
Status: On-going										
Pocahontas 24	Misc.	1	Coordinate with the Pocahontas Times, Allegheny Mountain Radio, and other county organizations with internet websites to include links to such emergency sources as the NEWS (for information about rain, river gauges, and weather warnings), etc.	November 2016	November 2021	PCOEM	Pocahontas Times	Public Education and Awareness	No funding required	
Status: On-going										
Pocahontas 25	Misc.	1	Review and update the Pocahontas County Emergency Operations Plan and include participation from municipalities in the planning process.	November 2016	November 2021	PCOEM	Local First Responders	Emergency Services	Up to $5,000 if a contractor is used.	EMPG, HSGP, HMEP, Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 26	Misc.	7	Encourage municipalities to either adopt the county emergency operations plan or develop their own plan that is fully consistent with the county plan	November 2016	November 2021	PCOEM		Emergency Services	Up to $5,000 if a contractor is used	EMPH, HSGP, Local Funding
Status: On-going										
Pocahontas 27	Misc.	1	Encourage local shipping companies and critical facilities to develop a "critical supply transportation plan" to ensure that the necessary supplies and/or materials they need to operate can be delivered during emergency incidents	November 2016	November 2021	Pocahontas County LEPC	PCOEM	Emergency Services	No funding required	
Status: On-going										
Pocahontas 28	Misc.	1	Coordinate with the American Red Cross (ARC) to determine suitable shelter sites and create agreements for the use of those facilities during emergencies	November 2016	November 2021	Local Chapter of the ARC	PCOEM	Emergency Services	No funding required	
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Pocahontas 29	Misc.	1	Coordinate with such agencies as the ARC, WVDHSEM, U.S. Department of Homeland Security (USDHS), etc., to post-incident relocation and recovery	November 2016	November 2021	PCOEM	Local Chapter of the ARC, WVDHSEM, USDHS	Emergency Services	No funding required	
Status: On-going										
Pocahontas 30	Misc.	1	Undertake Source Water Protection Planning measures following state guidelines	November 2016	November 2021	Municipal Water Providers, Local PSDs		Prevention		
Status: New. This project has been started, but was not included in the prior HMP update.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Durbin 1	Flooding	1	Review and update the floodplain ordinance to ensure full compliance with the National Flood Insurance Program (NFIP) standards	November 2016	November 2021	Durbin Floodplain Manager		Prevention	Enforcement may require funding	Local Funding
Status: On-going.										
Durbin 2	Flooding	2	Educate town council members and residents about the NFIP and its requirements. This project may include the facilitation of public forums to encourage questions regarding the NFIP.	November 2016	November 2021	Durbin Floodplain Manager		Public Education and Awareness	Little to no additional funding	Local Funding
Status: On-going.										
Durbin 3	Flooding	3	Coordinate with appropriate agencies to obtain updated NFIP policy-holder information within Durbin	November 2016	November 2021	Durbin Floodplain Manager		Prevention	Little to no additional funding	Local Funding
Status: On-going.										
Durbin 4	Flooding	4	Design and construct a sewage treatment plan out of the floodplain	November 2016	November 2021	Durbin Town Council	Region 4 PDC	Structural Projects	$500,000 to $2,500,000	CDBG, WV Infrastructure & Jobs Development Council (WVIJDC), United States Department of Agriculture (USDA), HMGP
Status: On-going.										
Durbin 5	Flooding	5	Coordinate with FEMA to maintain an updated list of repetitive loss properties throughout Durbin	November 2016	November 2021	Durbin Floodplain Manager	PCOEM	Prevention	Little to no additional funding	Local Funding
Status: On-going.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Durbin 6	Misc.	6	Either adopt the county Emergency Operations Plan or develop a town specific operations plan that is fully consistent with the county plan.	November 2016	November 2021	Durbin Town Council	PCOEM	Emergency Services	Up to $5,000 if a contractor is used.	EMPG, HSGP, Local Funding
Status: On-going.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Hillsboro 1	Thunderstorm, Wind	1	Promote any new construction and/or roof remodeling at the municipal level to be designed to withstand 90 mph winds	November 2016	November 2021	Hillsboro Town Council		Prevention	No additional funding required.	Local funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Marlinton 1	Flooding	1	Review and update the floodplain ordinance to ensure full compliance with NFIP standards	November 2016	November 2021	Marlinton Floodplain Manager		Prevention	Enforcement may require funding	Local Funding
Status: On-going. FEMA representatives were in the area on August 16th, 2016 to discuss.										
Marlinton 2	Flooding	2	Educate town council members and residents about the NFIP and its requirements. This project may include the facilitation of public forums to encourage questions regarding the NFIP.	November 2016	November 2021	Marlinton Floodplain Manager		Public Education and Awareness	Little to no additional funding	Local Funding
Status: On-going. FEMA representatives were in the area on August 16th, 2016 to discuss.										
Marlinton 3	Flooding	3	Coordinate with appropriate agencies to obtain updated NFIP policy-holder information within Marlinton	November 2016	November 2021	Marlinton Floodplain Manager		Prevention	Little to no additional funding	Local Funding
Status: On-going										
Marlinton 5	Flooding	5	Coordinate with FEMA to maintain an updated list of repetitive loss properties in Marlinton	November 2016	November 2021	Marlinton Floodplain Manager	PCOEM	Prevention	Little to no additional funding	Local Funding
Status: On-going, FEMA is working on collecting information, cannot do anything until that information is disseminated.										
Marlinton 6	Misc.	6	Either adopt the county Emergency Operations Plan or develop a town-specific operations plan that is fully consistent with the county plan.	November 2016	November 2021	PCOEM	Marlinton Town Council	Emergency Services	Up to $5,000 if a contractor is used,	EMPG, HSGP, Local Funding
Status: On-going,										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Webster 1	Flooding	5	Institute stricter floodplain enforcement	November 2016	November 2021	Webster County Floodplain Coordinator	WCOES, Webster County Commission, FEMA	Prevention	No additional funding should be required	Local funding
Status: On-Going										
Webster 2	Flooding	7	Identify all Repetitive Loss (RL) and flood prone non-RL properties within the county and coordinate with owners who would like to participate in future elevation, buyout and retrofitting projects	November 2016	November 2021	Webster County Floodplain Coordinator	WCOES, Webster County Commission	Prevention	Approx. $47,500 per structure purchased	HMPG
Status: On-Going										
Webster 3	Flooding	4	Clean waterways to prevent water from backing up and possibly flooding certain areas	November 2016	November 2021	None	WCOES, Municipal Public Works Partners, WVDOH	Natural Resource Protection	Unknown	HMGP, State funding, local funding
Status: On-Going										
Webster 4	Mass Movements	6	Coordinate with WVDOH implementing a plan of action to take when coordinating clean-up efforts	November 2016	November 2021	WCOES (as the county POC)	WVDOH, Municipal Public Works Partners	Emergency Services	Little to no additional funding	Local funding
Status: On-Going										
Webster 5	Misc.	3	Identify assets within the county for more accurate loss estimates and work with the private sector to make resources available in concert with the LEPC's resource manual	November 2016	November 2021	Webster County LEPC	WCOES	Emergency Services	Up to $5,000 if a contractor is used.	HMEP, Local Funding
Status: On-Going										
Webster 6	Misc.	1	Undertake Source Water Protection Planning measures following state guidelines	November 2016	November 2021	West Virginia American Water, Local PSDs	WCOES	Prevention	Little to no additional funding	Local funding
Status: New. This project has been started, but was not included in the prior HMP update.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Webster 7	Misc.	2	Install generators at shelter sites	November 2016	November 2021	WCOES		STructural	Up to $80,000 each, including installation.	HMGP
Status: New										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Camden on Gauley 1	Flooding	1	Identify culverts, storm drains, etc. that frequently back-up, causing flash flooding.	November 2016	November 2021	Town Council	WVDOH	Prevention	Identifying these locations will require little to no additional funding	Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Cowen 1	Mass Movement	1	Coordinate with local agencies to develop a plan of action for the identified landslide prone areas	November 2016	November 2021	Town Council	WCOES, WVDOH, Webster County Commission	Emergency Services	Up to $10,000 if a contractor is used	PDM, Local Funding
Status: On-going										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Webster Springs	Flooding	1	Clean waterways to prevent water from backing up and possibly flooding certain areas	November 2016	November 2021	Town of Addison	WCOES, Municipal Public Works Partners, WVDOH	Natural Resource Protection	Unknown	HMGP, State Funding, Local Funding
Status: On-going										

4.0 PLAN MAINTENANCE

4.1 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.

4.1.1 Monitoring, Evaluating, and Updating the Plan

The Region 4 Planning and Development Council (Region 4 PDC) and the core planning team have established a method for the systematic and periodic review of this document. The Region 4 PDC and committee will monitor the performance of the plan in several ways (see below). Participating jurisdictions will also evaluate mitigation strategies as the chance to implement them arises.

As the plan is current for a five-year span, the Steering Committee will meet no later than the fourth year to conduct an overall review of the entire plan, its appendices, changes entered by the Master Copy of the plan. The Master Copy is where all additions, corrections and changes to the plan are made. This copy of the plan will be maintained by the Region 4 PDC. Based on the review, the plan will be brought up to date to reflect the most current information about the Core Committee, the planning process, the most current hazard data, vulnerability analysis, mitigation strategy and plan maintenance processes. The plan update will be done by the PDC or by contractor under the guidance of the PDC.

The formal updating process will consist of a series of meetings (either face-to-face or virtual) to review mitigation projects, the hazard identification and risk assessment, and to compare the two. The effectiveness of any implemented mitigation strategies should also be determined.

The core committee will evaluate the performance of the plan based on several criteria. For instance, the committee should consider revising mitigation

strategies if it appears that the plan is failing according to one of the following measures.

- **Cost Effectiveness:** Is sufficient funding available to implement the project at a cost manageable by the local government? If not, is funding available? Will the costs of implementing the project be significantly less than the cumulative future costs potentially incurred by an un-corrected situation?
- **Property Protection:** How significant will the action be at eliminating or reducing damage to structures and infrastructure?
- **Life Safety:** How effectively will the action protect lives and prevent injuries?
- **Environmental Impacts:** Will implementing the project adversely affect the environment in any way? Will implementing the project actually benefit the environment?
- **Social Impacts:** Will the public perceive the project as positively lessening hazard-related losses? Will implementing the project adversely affect any segment of the population?
- **Legal Impacts:** Do your governmental organizations and/or partner agencies have the authority to implement the actions?
- **Political Impacts:** Will implementing the project create negative political issues?
- **Overall Feasibility:** Do local policies and capabilities currently allow for the implementation of the project? Are programs available to assist in funding the implementation of the project? Do local leaders generally agree that implementing the project will be beneficial to the community?

The monitoring of this plan also includes methods for ensuring that projects are successfully implemented and contribute to the achievement of the mitigation goals outlined in Section 3.0. All of the individual projects listed in this plan are accompanied by a series of potential funding sources. Many of these funding sources require stringent project administration tasks (including performance measures and close-out procedures), all of which would be followed by the jurisdiction implementing a project. Adherence to these requirements will ensure the successful implementation of projects funded by such programs. For projects funded locally, existing purchasing policies will be followed, including competitive bidding, maintenance of invoice copies, regular departmental budget reviews, etc. All files

associated with purchasing at the local level are maintained. This procedure has been successful while implementing mitigation projects since the original development of this plan and will continue to be followed.

4.1.2 Planning Addendums

Addendums to this plan may become necessary during its life cycle as programs and priorities change. Addendums that are requested and approved at the local level may be passed through the Region 4 Planning and Development Council to the West Virginia Department of Homeland Security and Emergency Management (WVDHSEM) and to FEMA Region 3. Addendums that are approved by WVDHSEM and FEMA will be included in the plan and will not need to be adopted by resolution by the various municipalities of Region 4.

4.1.3 Implementation through Existing Programs / Capabilities Assessment

The following table identifies the types of plans, policies, and other local capabilities that enable or constrain the implementation of hazard mitigation efforts in the jurisdictions comprising Region 4.

COMMUNITY	PLANNING COMMISSION	COM-PREHENSIVE PLANS	FLOOD-PLAIN REGS	BLDG DEPT.	ZONING ORDIN-ANCES	CAPITAL BUDGET [1]	PUBLIC WORKS BUDGET[1]
Fayette County	YES[2]	YES (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Greenbrier County	YES[2]	YES (Local)/YES[2]	YES	YES	YES	(none)	Limited in-kind wages only
Nicholas County	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Pocahontas County	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Webster County	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Montgomery	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Mount Hope	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Oak Hill	YES[2]	YES (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Smithers	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Lewisburg	YES[3] (Local)/YES[2]	YES (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Ronceverte	YES[2]	NO (Local)/YES[2]	YES	YES	YES	(none)	Limited in-kind wages only
White Sulphur Springs	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Summersville	YES[2]	YES (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Ansted	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Fayetteville	YES[2]	YES (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Gauley Bridge	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Meadow Bridge	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Pax	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Thurmond	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	(none)
Alderson	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Quinwood	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Rainelle	YES (Local)/YES[2]	YES (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Renick	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Rupert	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Richwood	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Durbin	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Hillsboro	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Marlinton	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only
Camden-on-Gauley	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Cowen	YES[2]	NO (Local)/YES[2]	YES	NO	NO	(none)	Limited in-kind wages only
Webster Springs	YES[2]	NO (Local)/YES[2]	YES	NO	YES	(none)	Limited in-kind wages only

1. *Budget that would allow the jurisdiction to devote financial resources towards hazard mitigation activities.*
2. *Covered by a regional or otherwise multi-jurisdictional document.*
3. *Lewisburg's historic landmarks commission is also heavily involved in downtown development.*

The members of the core committee are leaders within the communities and agencies that they represent. They are often involved in the overall community, economic development, and capital improvements planning efforts of their jurisdictions. These individuals include (but are not limited to):

- Local government representatives (commissioners and mayors),
- Floodplain administrators, and
- Offices of emergency management personnel (from the county level).

As members with 'inside knowledge' of hazard mitigation, these individuals serve to integrate data, information, and (more generally) goals and actions from the hazard mitigation effort into these other localized plans. The steering committee elected to keep mitigation goals and objectives for the region general in nature. A broad goal, such as "Reduce the impact of flooding," allows for flexibility. Local stakeholders are able to creatively address flooding through a variety of different project types, in both minor and major ways.

Floodplain administrators, it should be noted, serve in a daily role as supporters of hazard mitigation. Through such roles as floodplain ordinance enforcement, these individuals advise the mitigation steering committee and other partners within the region as to the efforts that are working, those that need revision, etc. Further, floodplain administrators often coordinate field level mitigation decisions (e.g., permit approval, decisions to pursue community rating system status, etc.). In Greenbrier County, the county-level plans and permitting department also addresses compliance with floodplain ordinances, zoning issues, subdivision approval, zoning appeals, farmland protection, geographic information systems (GIS) and dilapidated buildings and neglected properties.

Additionally, hazard mitigation is integrated into other planning efforts for the region through the daily responsibilities of the Region 4 Planning & Development Council staff. The council's staff serves to both coordinate and support planning efforts throughout the region. Significantly, the PDC serves as the custodial agency for the region's Comprehensive Economic Development Strategy (CEDS). Hazard mitigation features in the CEDS document as a consideration for economic development in the region. Council staff also supports individual county economic development authorities and other non-profit organizations that take an interest in the region. In such a role, the council staff is uniquely positioned to recommend and/or

highlight mitigation issues through the conduct of those development efforts. In other areas, the council staff coordinates development efforts. The PDC frequently supports infrastructure development in the region. As an example, the PDC may be able to suggest the inclusion of such concepts as green infrastructure/low-impact development as parts of projects designed to address stormwater management.

Generally, a mix of jurisdiction-specific personnel and agencies serving multiple jurisdictions ensures that each specific jurisdiction in Region 4 aptly considers hazard mitigation.

- **Jurisdiction-Specific Participants:** County and municipal floodplain coordinators, local government representatives from every jurisdiction in the region on the regional council
- **Participants Serving Multiple Jurisdictions:** Region 4 PDC staff, county emergency managers (serve the municipalities within their county area), county-level economic development agencies

To date, local policies have not hindered hazard mitigation efforts. The jurisdictions participating in this planning process have used a variety of funding to complete mitigation projects in the past, including the Hazard Mitigation Grant Program, Homeland Security Grant Program, Emergency Management Performance Grant, Community Development Block Grant, and local funding. Local government policies and programs have supported the use of this funding and, thus, the implementation of mitigation projects. Further, all participating government jurisdictions have demonstrated a capability to successfully implement and administer mitigation projects.

4.1.4 Continued Public Involvement

The Region 4 PDC understands that the general public must be involved in the initial planning process, as well as the updates to the completed plan. As such, the Core Committee will invite the public to participate as the plan is updated through attendance at future public and Core Committee meetings, distributing questionnaires, etc. Further, as the updated plan is adopted, the public will be given the chance to comment on the updated plan prior to its adoption by passage resolution or ordinance.

The PDC, at a minimum, will maintain file copies of the Hazard Mitigation Plan that are available for review and inspection during routine business hours. The PDC intends to log all comments received regarding the mitigation plan. Members of the public are invited to contact the PDC with comments regarding hazard events, etc. Local officials are also invited to review the plan's effectiveness at determining hazard susceptibility based on data from hazard events as they occur.

5.0 APPENDICES

APPENDIX 1: EVIDENCE OF PUBLIC AND STAKEHOLDER INVOLVEMENT

This appendix contains evidence that the public and participating jurisdictions were involved in the development of the hazard mitigation plan. It contains copies of sign-in sheets from meetings as well as copies of newspaper and/or other advertisements providing notice of those meetings. It also contains copies of Risk Assessment Survey announcements through traditional and social media.

Hazard Mitigation.

A Hazard Mitigation Plan is mandatory for our communities (Fayette, Greenbrier, Nicholas, Pocahontas & Webster Counties) to be eligible for FEMA funding.

Please participate by taking our survey at www.surveymonkey.com/r/r4risk

Or tell us in person! Upcoming public meetings are tentatively scheduled as follows (please check back for updates):

Fayette County: Wednesday, April 13th, 9:00 a.m. @ the office of Fayette County Emergency Management, 1047 Nick Rahall Greenway, Fayetteville

Greenbrier County: Thursday, April 14th, 10:00 a.m. @ the Greenbrier County Health Department, 9207 Seneca Trail, Ronceverte

Nicholas County: Wednesday, May 4th, 3:00 p.m. @ the office of Region 4 PDC, 885 Broad Street, Suite 100, Summersville

Pocahontas County: Thursday, May 19th, 11:00 a.m. @ the McClintic Public Library, Marlinton

Webster County: Wednesday, May 11th, 10:00 a.m. @ the First Methodist Church, 120 Church Street, Webster Springs

Click HERE to view the current Hazard Mitigation Plan.

THE POCAHONTAS TIMES
206 Eighth Street, Marlinton, WV 24954
304-799-4973

CERTIFICATE OF PUBLICATION

State of West Virginia
County of Pocahontas

I, Jaynell Graham, Editor of The Pocahontas Times, a weekly newspaper of general circulation published at Marlinton, West Virginia in the County of Pocahontas, State of West Virginia, do certify that publication of advertisements (case # or description) **Hazard Mitigation Plan Public Meetings** attached hereto was made in **1** issue(s) of the newspaper, dated **May 12, 2016,**

.

Given under my hand this **12th** day of **May**, 20 **16**

Jaynell Graham
Editor

$ **20.13**
Publication Fee

Subscribed and Sworn to before me

This **12th** day of **May**, 20 **16**

My Commission expires February 11, 2020

Signature _____
Notary Public

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
JACLYN N. HOLLANDSWORTH
26 LONESOME HOLLOW LANE
MARLINTON, WV 24954
My commission expires February 11, 2020

Legal Notices

PUBLIC SERVICE COMMISSION
OF WEST VIRGINIA
CHARLESTON

ASE NO. 15-1734-E-T-PC

PPALACHIAN POWER COMPANY and WHEELING POWER COMPANY, both dba ERICAN ELECTRIC POWER

pplication for approval of demand response and backup and
aintenance service tariff provisions.

NOTICE OF EVIDENTIARY HEARING

n October 23, 2015, Appalachian Power Company and Wheeling Power Company operating as American Electric Power (Companies), filed with the Public Service mission of West Virginia a tariff containing terms and conditions for furnishing electservice to approximately 473,331 customers in cities, towns, villages, unincorporated nicipalities, and rural areas in their service territories in the counties of Boone, Brooke, ell, Clay, Fayette, Greenbrier, Jackson, Kanawha, Lincoln, Logan, Marshall, Mason, owell, Mercer, Mingo, Monroe, Nicholas, Ohio, Putnam, Raleigh, Roane, Summers, ne, and Wyoming.

he Commission suspended the tariffs to permit a full examination of the proposed f changes consisting of two new riders for demand response service, Rider D.R.S.— Capacity and Rider D.R.S. and a new Standard Backup and Maintenance Service edule, Schedule S.B.S.

he Commission will hold the evidentiary hearing in this matter on August 2, 2016, :30 a.m., in the Howard M. Cunningham Hearing Room, Public Service Commission ding, 201 Brooks Street, Charleston, West Virginia, and continuing as necessary eafter.

embers of the public may observe the evidentiary hearing.

PPALACHIAN POWER COMPANY
WHEELING POWER COMPANY

7/14 1t

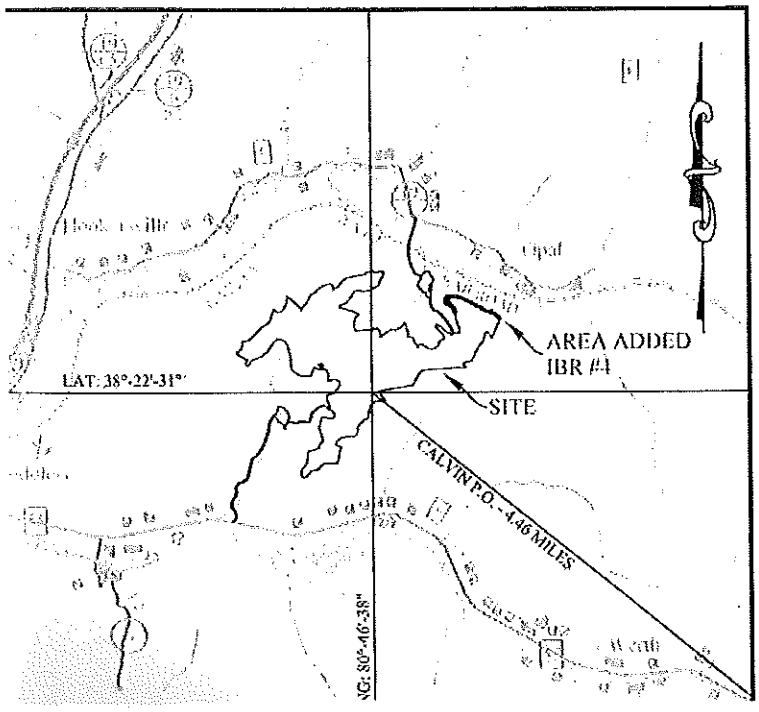
HAZARD MITIGATION PLAN

ical emergency management professionals, in conjunction with Region 4 Planning and lopment Council, are tackling the task of updating the region-wide Hazard Mitigation . This plan is important to the continued eligibility of FEMA funding within our comities.

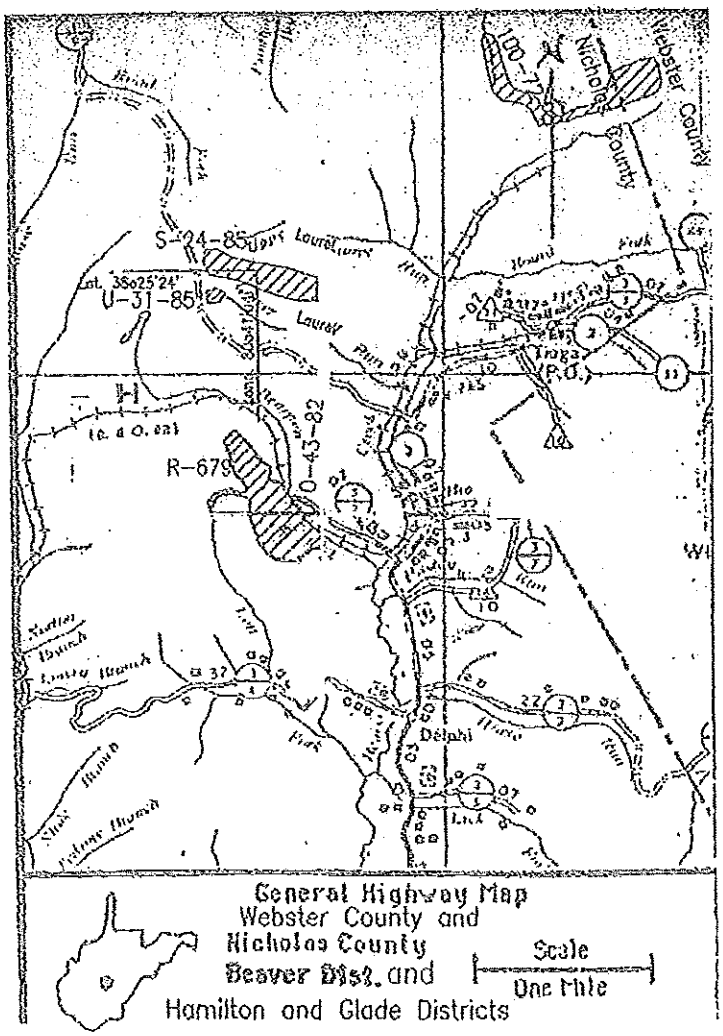
public meeting for residents of Nicholas County will be held on Wednesday July 20, at 5:30 p.m. at the Summersville City Hall, 400 North Broad Street, in Summersville This meeting is intended to solicit comment for planning and purpose only.

or more information please contact Region 4 Planning and Development Council by e at (304) 872-4970 ext. 303 or by e-mail at chughart@reg4wv.org or visit us on the at reg4wv.org.

7/14 1t



Legal Notices



S-24-85 Lower Laurel Surface Mine
NPDES Permit No. WV0032115

ADVERTISEMENT

Notice is hereby given that GAULEY EAGLE HOLDINGS INC., 279 Ballpar Ste 103, Craigsville, WV 26205 has submitted an application with the Departm Environmental Protection (DEP), 254 Industrial Drive, Oak Hill, WV 25901 for a P release on Permit Number S002485 issued for 191.62 acres.

The permit is located in Nicholas County 1 mile Northwest of Tioga, WV, on Laurel Run of Big Beaver Creek of Gauley River.

Gauley Eagle Holdings Inc. completed backfilling and regrading on 10/01/19 is requesting release of 60 percent of the reclamation performance bond currently amount of $192,000.00.

Written comments will be received at the DEP address above until 08/20/2016, ty (30) days from date of final publication.

6/30, 7/7, 7/14, 7

Hazard Mitigation

NAME	MUNICIPALITY/COUNTY	E-MAIL ADDRESS
1. Jamie Meadows	Region 4	
2. Taylor Jones	JH Consulting	TJones@jhcpreparedness.com
3. Jeffery Harvey	JH Consulting, LLC	jharvey@jhcpreparedness.com
4. Cassandra Hughart	Region 4	
✓ 5. Theresa White	Region 5 DHSEM, Liaison	Theresa.g.white@wv.gov
6. Tiffany Cottle	Fayette County	tcottle@fayettecountywv.org
7. Shawn Dunbrack	WVDHSEM R4 Liaison	SHAWN.D.DUNBRACK@WV.GOV
✓ 8. Al Whitaker	Greenbrier Co. HSEM 911	AL.Whitaker@greenbriercounty.cmax.net
9. James Bennett	Fayette County 911	JBennett@FayetteCounty911wv.org
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2/29/16 Haz Mit Conf. Call

- 56 survey responses so far

- Jamie - Richard, webster
- Cassie
- Al Whitaker
- John
- Taylor

Get back w/ Taylor w/ any comments by end of week.
Taylor discussed social vulnerability. Using CDC information to compile.

Follow up on assest inventory w/ steering committee.

AL working on comments.

In person meeting in March. Go over project list.

Reach back out to Folkson outreach

Remove ~~Wier~~ Weir from e-mail chain

Call Greenbrier valley about new contact.

Respond to outreach inquiry. Include note about security settings.

Hazard Mitigation Steering Committee
June 14, 2016
10:00 am

NAME	MUNICIPALITY/COUNTY	E-MAIL ADDRESS
1. Jamie Meadows	Region 4	
2. SHAWN DUNBRACK	WVDHSEM	SHAWN.D.DUNBRACK@WV.GOV
3. PAULA BROWN	Greenbrier Co HSEM	paula.brown@greenbriercountyema.net
4. Tiffany Cottle	FCOEM	tcottle@fayettecountywv.org
5. Cassie Hughart	Region 4	
6. Theresa White	WVDHSEM	theresa.g.white@wv.gov
7. Jim Lawson	NCHSEM	Jim.Lawson@Nicholasoes.org.
8. Kelsi Bennett	Region 4	
9. Richard Rose	Webster County OEM	via telephone
10. Jeff Harvey	J.H. Consulting	via telephone
11.		
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Region 4 Planning & Development Council

Serving Fayette, Nicholas, Greenbrier, Pocahontas and Webster Coun

Contact | The Council | Region 4 Team | Inf

October 2016

Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	1
3	4	5			
10	11	12 Hazard M			

12

x

Hazard Mitigation Steering Committee Meeting

Wednesday, October 12, 10:30am-10:00am

10.12.16

HazardMit Steering Committee

Cassandra Hughart
Jamie Meadows
Shawn Wolford
Taylor Jones
Paula Brown
Al Whitaker
Richard Rose
Kevin Walker

Fayette County
HMP Public Meeting
Sign-in Sheet
April 13, 2016

1.	JASON FAVOR	
2.	Tiffany Cottle	
3.	Rebecca Jones	
4.	Kevin Walker	FC Director
5.	Joseph E. Dooley	
6.	Jon ~~PFEIFFER~~	WV PSC
7.	Barbara Painter	SHLS
8.	Denise Scalph	FCC
9.	Debbie Berry	Fay. Co. Comm.
10.	Delpha Bennett	Fayetteville First Church of God
11.	Theresa White	WV DHSEM Region 5
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GVCC-LEPC HAZARD MITIGATION MEETING

APRIL 14, 2016 10:00AM-NOON GREENBRIER COUNTY HEALTH DEPARTMENT

NAME	AGENCY	EMAIL	PHONE
Reba Moller	City of Ronceverte	administrator@cityofronceverte.com	304/6475455
Tia Humphreys	Gbr. Co. Health Dept.	tiw.r.willis@wv.gov	(304) 667-2793
Cindy Henthorn	Gbr Valley ARC DRS	cindy.henthorn@redcross.org	3049228565
Connie Rose	GVMC	connie.rose@gvmc.com	304-647-6509
Travis Copenhaver	Town of Alderson	mayor@aldersonwv.org	304-661-2566
Wayne Brown	Deer Holler Farm	Wayne1317@gmail.com	304-645-1339
Andy Pendleton	Town of Rainelle	AndyPen24@icloud.com	304-647-9233
Kelly Banton	Greenbrier County Comm.	kelly.banton@greenbriercounty.net	304-647-6689 ext.0
Paula Brown	GCHSEM	paula.brown@greenbriercountyema.net	304-645-5444
Cassandra Hughart	Region 4 PDC	chughart@reg4wv.org	304-872-4970
Taylor Jones	JH Consulting	TJones@jhpreparedness.com	304-473-1009
Jamie Meadows	Region 4 PDC	jmeadows@reg4wv.org	304-872-4970
Al Whitaker	Greenbrier Co HSEM/911	Al.Whitaker@greenbriercountyema.net	304-645-5444
David Neal	American Red Cross	David.Neal@Redcross.org	304-255-1508
Matt Ford via phone			
James Lewis via phone			

NICHOLAS COUNTY LEPC/E-911 ADVISORY BOARD

JULY 20, 2016

NAME	EMAIL	AGENCY
Dyann Martin		NC DHSEM
DEREK McMURRAY	DEREK@BRIGHTHORIZONSWV.ORG	BRIGHT HORIZONS
Rodney Boyce	Rodney.J.Boyce@wv.gov	Nicholas Co. Health Dept.
JAY NOWAK	chief@summersvillewv.org	Summersville P.D.
DANIEL TAYLOR	danieltaylor@redicareamb.com	REDICARE
Michael Cox	michaelcox@redicareamb.com	Redi Care
David Cox		Beaver Dist. Rep.
WAYNE BOX	waynebox@FEMA.DHS.GOV	FEMA
Rebecca Stone	rstone@shsinc.org	Seneca Health Services
John Miller	bowmiller@yahoo.com	Nicholas Co. Commission
Lyle Neal	ccexcavating@yahoo.com	Nicholas Co Commission
Sasha Lefler	sashalefler5875@gmail.com	Jan Care
Jennifer Anderson	jennands1@yahoo.com	Jan care
KEN ALTIZER	cleekenz@FRONTIER.COM	Co. Commission

Pocahontas County
HMP Public Meeting
Sign-in Sheet
May 19, 2016

1. Cassandra Hughart
2. Heather Nida - Allegheny Mountain Radio - Prg Director
3. John Laycock 2133 Edray Rd Marlinton - LEPC 799 7191
4. Jessica Shinaberry Pocahontas Co Health Dept 799-4154
5. Mike Riggsby Pocahontas Memorial Hosp. 799-7400
6. Michelle Dallessandro USEPA START, Tech Law 304 830 1444 mdallessandro@techlawinc.com
7. Cindy Wilfong Poc Co. Health Dept 304-799-4154
8. Anne M. Walker Hillsboro 304-653-8879
9. Michael O'Brien PCHSEM 304 799 3985
10. Shawn Dunbrack WV DHSEM 304-799-6973
11.
12.
13.
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Webster County
HMP Public Meeting
Sign-in Sheet
May 11, 2016

1.	David Neal	304-255-1508	David.Neal@redcross.org
2.	Todd Farlow	304-847-2943	coordinator@wcfrn.com
3.	Sue Talbott	304-847-7291	Webstermain@citlink.net
4.	Phyllis Henderson	304-847-8633	pmhendrson33@hotmail.com
5.	Jenny Farley	304-847-2801	Jenny.R.Farley@wv.gov
6.	Donald Shaffer	304-849-8496	shafferdonnie@gmail.com
7.	Michael L. Robinson	304-657-2245	mrobinson@cog-wv.org Mikerobinson92@yahoo.com
8.	Shawn Dunbrack	304-807-5630	SHAWN.D.DUNBRACK@WV.GOV
9.	Jack Hayhurst	304-226-5301	
10.	George Clutter	304-847-5483	
11.	Kathie Hamrick	304-847-5483	mary.k.hamrick@wv.gov
12.	Sandra Cochran	304-847-5483	sandra.j.cochran@wv.gov
13.	Richard Rose	304-847-2122	Websteroes@citlink.net
14.	Jami Meadows	304-872-4970	jmeadows@reg4wv.org
15.			
16.			
17.			
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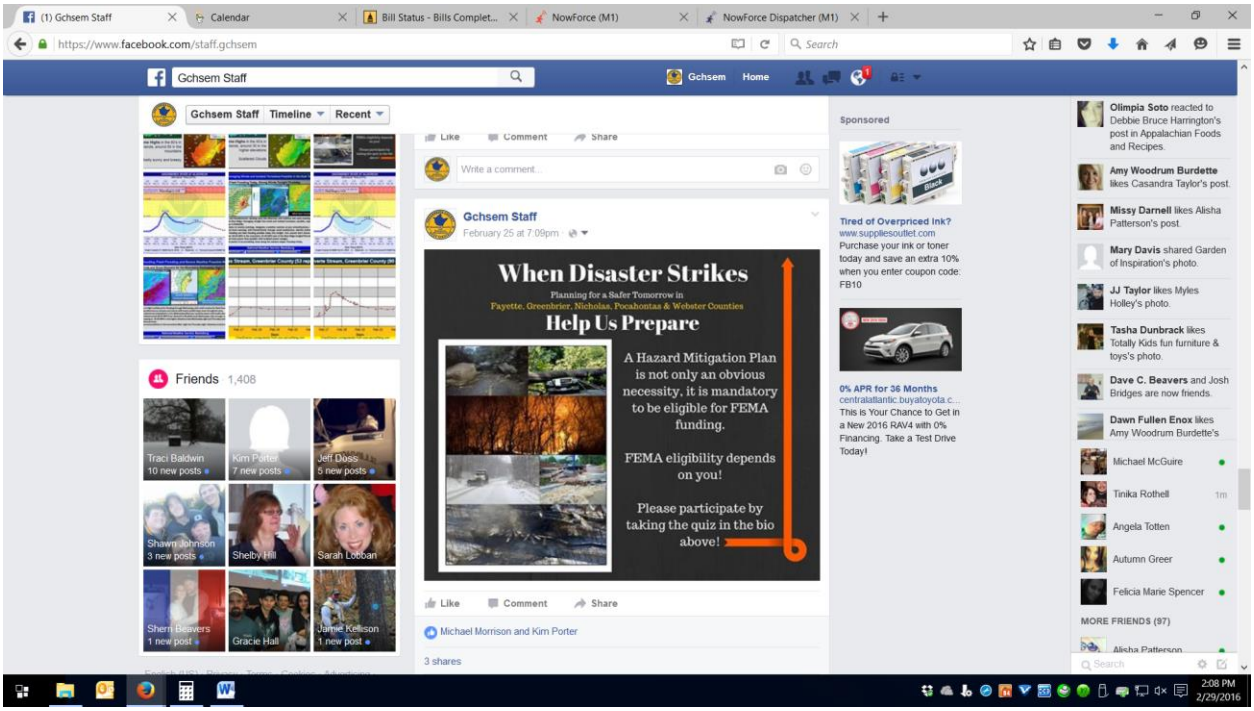
Hazard Mitigation - October 16, 2015

Sign in sheet

Jamie Meadows
Al Whitaker
Theresa White
MIKE JUDY
John Tuggle
TIM Richardson
Jeff Harvey
Gary Weer


(1) Gchsem Staff
Calendar
Bill Status - Bills Complet...
NowForce (M1)
NowForce Dispatcher (M1)
https://www.facebook.com/staff.gchsem
Search
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Timeline
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Comment
Share
Write a comment...
Gchsem Staff
February 25 at 7:09pm
When Disaster Strikes
Planning for a Safer Tomorrow in
Fayette, Greenbrier, Nicholas, Pocahontas & Webster Counties
Help Us Prepare
A Hazard Mitigation Plan is not only an obvious necessity, it is mandatory to be eligible for FEMA funding.
FEMA eligibility depends on you!
Please participate by taking the quiz in the bio above!
Like
Comment
Share
Michael Morrison and Kim Porter
3 shares
Friends 1,408
Traci Baldwin
10 new posts
Kim Porter
7 new posts
Jeff Doss
5 new posts
Shawn Johnson
3 new posts
Shelby Hill
Sarah Lobban
Sherri Beavers
1 new post
Gracie Hall
Jamie Kellison
1 new post
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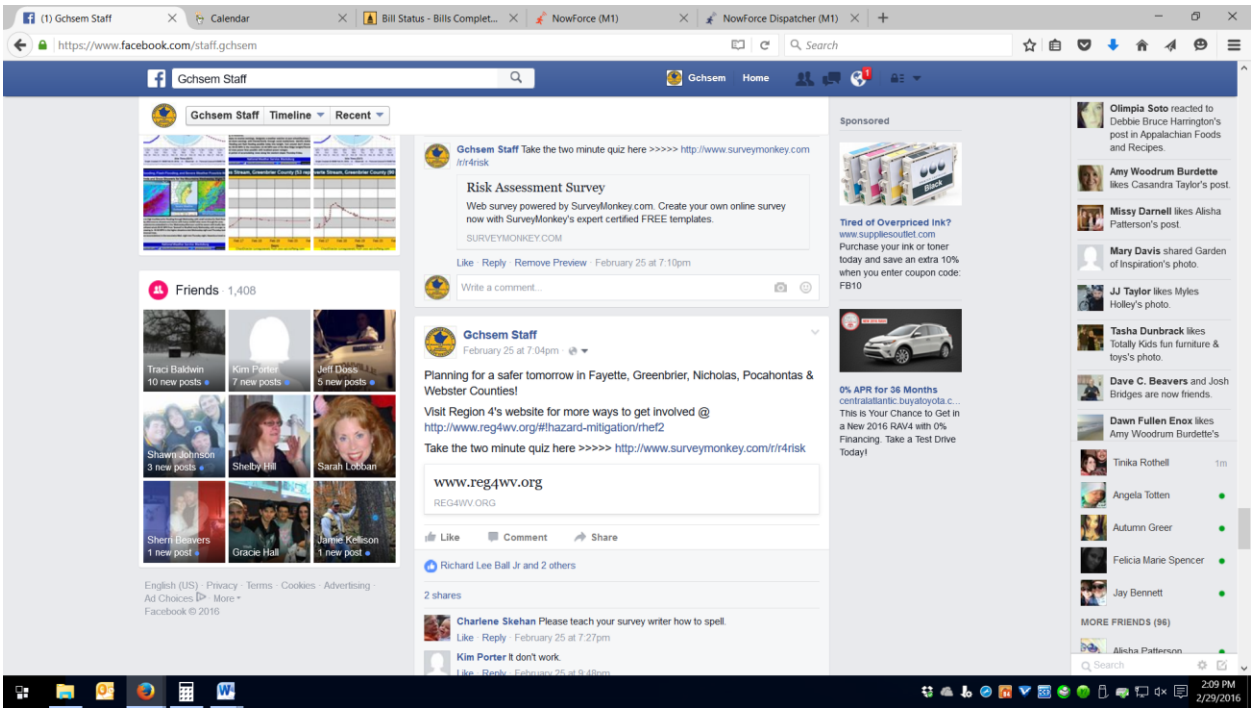
Olimpia Soto reacted to Debbie Bruce Harrington's post in Appalachian Foods and Recipes.
Amy Woodrum Burdette likes Casandra Taylor's post.
Missy Darnell likes Alisha Patterson's post.
Mary Davis shared Garden of Inspiration's photo.
JJ Taylor likes Myles Holley's photo.
Tasha Dunbrack likes Totally Kids fun furniture & toys's photo.
Dave C. Beavers and Josh Bridges are now friends.
Dawn Fullen Enox likes Amy Woodrum Burdette's
Michael McGuire
Tinika Rothell
1m
Angela Totten
Autumn Greer
Felicia Marie Spencer
MORE FRIENDS (97)
Search
2:08 PM
2/29/2016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NowForce (M1)
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Gchsem Staff Take the two minute quiz here >>>>> http://www.surveymonkey.com/r/r4risk
Risk Assessment Survey
Web survey powered by SurveyMonkey.com. Create your own online survey now with SurveyMonkey's expert certified FREE templates.
SURVEYMONKEY.COM
Like · Reply · Remove Preview · February 25 at 7:10pm
Write a comment...
Gchsem Staff
February 25 at 7:04pm
Planning for a safer tomorrow in Fayette, Greenbrier, Nicholas, Pocahontas & Webster Counties!
Visit Region 4's website for more ways to get involved @ http://www.reg4wv.org/#hazard-mitigation/rhef2
Take the two minute quiz here >>>>> http://www.surveymonkey.com/r/r4risk
www.reg4wv.org
REG4WV.ORG
Like
Comment
Share
Richard Lee Ball Jr and 2 others
2 shares
Charlene Skehan Please teach your survey writer how to spell.
Like · Reply · February 25 at 7:27pm
Kim Porter It don't work.
Like · Reply · February 25 at 8:48pm
Friends 1,408
Traci Baldwin
10 new posts
Kim Porter
7 new posts
Jeff Doss
5 new posts
Shawn Johnson
3 new posts
Shelby Hill
Sarah Lobban
Sherri Beavers
1 new post
Gracie Hall
Jamie Kellison
1 new post
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Tinika Rothell
1m
Angela Totten
Autumn Greer
Felicia Marie Spencer
Jay Bennett
MORE FRIENDS (96)
Search
2:09 PM
2/29/2016

Prioritization Matrix Instructions

1 List projects across the top row of the matrix.

2 On a scale of 1 to 5 (5 being the best), score each project according to the criteria in the left-hand column. Score each project according to your opinion of its merit. No comparison is made during the initial scoring.

3 Tally the score for each project by adding the numbers in the column under the project. Place the answer in the same column of the "Total" row.

4 The highest score is the highest-priority project. (NOTE: Multiple projects may have the same ranking.)

5 Definition of Scoring Criteria:

Ease of Implementation:	Do local policies and capabilities currently allow for the implementation of the project? Are programs available to assist in funding the implementation of the project?
Cost Effectiveness:	Is sufficient funding available to implement the project at a cost manageable by the local government? If not, is funding available? Will the costs of implementing the project be significantly less than the cumulative future costs potentially incurred by an un-corrected situation?
Social Impacts:	Will the public perceive the project as positively lessening hazard-related losses? Will implementing the project adversely affect any segment of the population?
Political Impacts:	Will implementing the project create negative political issues?
Economic Impacts:	Is the cost/benefit ratio of implementing the project acceptable? Will implementing the project adversely affect the local economy?
Overall Positive Impact:	Do local leaders generally agree that implementing the project will be beneficial to the community?

Project Prioritization Matrix

PROJECT → / **CRITERIA**											
Ease of Implementation											
Cost Effectiveness											
Social Impacts											
Political Impacts											
Economic Impacts											
Overal Position Impact											
TOTAL											

APPENDIX 2: SURVEY RESULTS

Question 1

What hazards do you believe exist in your community? (Check all that apply.)

Answer Options	Response Percent	Response Count
Dam Failure	15.1%	13
Drought	40.7%	35
Earthquake	12.8%	11
Extreme Temperatures (cold/hot)	57.0%	49
Flooding	87.2%	75
Hailstorms	53.5%	46
Hazardous Materials	48.8%	42
Mass Movement (landslides, sinkholes, etc.)	39.5%	34
Terrorism	22.1%	19
Thunderstorms	68.6%	59
Tornados	22.1%	19
Wildfire	52.3%	45
Wind	72.1%	62
Winter Storms	96.5%	83
Other (please specify)	8.1%	7
	answered question	86
	skipped question	0

Number	Response Date	Other (please specify)
1	Mar 2, 2016 3:22 PM	Pandemic Exposure
2	Feb 26, 2016 11:56 AM	Safety of drinking water sources
3	Feb 26, 2016 4:50 AM	Utility failure (water or power)
4	Feb 26, 2016 3:56 AM	Contaminated public water
5	Feb 26, 2016 2:27 AM	B j
6	Feb 26, 2016 12:28 AM	My definition of hazards are potential extremes..that's how I based my answers.
7	Feb 26, 2016 12:23 AM	Ignorant neighbors

Question 2

Which hazard do you believe poses the largest risk for your community? (Choose 3.)

Answer Options	Response Percent	Response Count
Dam Failure	4.8%	4
Drought	3.6%	3
Earthquake	1.2%	1
Extreme Temperatures (cold/hot)	15.5%	13
Flooding	81.0%	68
Hailstorms	0.0%	0
Hazardous Materials	20.2%	17
Mass Movement (landslides, sinkholes, etc.)	9.5%	8
Terrorism	2.4%	2
Thunderstorms	21.4%	18
Tornados	1.2%	1
Wildfire	6.0%	5
Wind	35.7%	30
Winter Storms	67.9%	57
Other (please specify)	3.6%	3
answered question		84
skipped question		2

Number	Response Date	Other (please specify)	Categories
1	Mar 2, 2016 3:22 PM	Prolonged Power Outages	
2	Feb 26, 2016 11:56 AM	Possible water source contamination	
3	Feb 26, 2016 12:23 AM	Ignorant neighbors	

Question 3

In the past 10 years, which hazards do you recall having occurred in your community? (Check all that apply.)		
Answer Options	**Response Percent**	**Response Count**
Dam Failure	0.0%	0
Drought	17.9%	15
Earthquake	7.1%	6
Extreme Temperatures (cold/hot)	47.6%	40
Flooding	81.0%	68
Hailstorms	25.0%	21
Hazardous Materials	27.4%	23
Mass Movement (landslides, sinkholes, etc.)	15.5%	13
Terrorism	0.0%	0
Tornados	8.3%	7
Wildfire	9.5%	8
Wind	64.3%	54
Winter Storms	88.1%	74
Other (please specify)	10.7%	9
	answered question	84
	skipped question	2

Number	Response Date	Other (please specify)	Categories
1	May 13, 2016 1:38 PM	Derecho storm	
2	Apr 15, 2016 3:03 PM	Derecho	
3	Apr 14, 2016 8:43 PM	Derecho	
4	Mar 2, 2016 3:22 PM	Water and Power Failure	
5	Feb 26, 2016 2:11 PM	Electrical Power failures	
6	Feb 26, 2016 10:45 AM	Derechio	
7	Feb 26, 2016 4:50 AM	Loss of power & water supply	
8	Feb 26, 2016 3:56 AM	Contaminated public water	
9	Feb 26, 2016 2:24 AM	none	

Question 4

Think back to a recent hazard occurrence (any from questions 1, 2 or 3). How would you rate your community's ability to handle the hazard event?		
Answer Options	**Response Percent**	**Response Count**
Excellent	11.0%	9
Good	37.8%	31
Average	35.4%	29
Poor	15.9%	13
Horrible	0.0%	0
answered question		82
skipped question		4

Question 5

During this event did you receive information or warnings from your local public officials/emergency management officials?		
Answer Options	**Response Percent**	**Response Count**
Yes	69.5%	57
No	30.5%	25
answered question		82
skipped question		4

Question 6

How did you receive this information?		
Answer Options	**Response Percent**	**Response Count**
Television	38.2%	21
Newspaper	10.9%	6
Radio	52.7%	29
Media Website (TV, print or radio)	27.3%	15
Social Media	81.8%	45
Website	29.1%	16
Text Message	52.7%	29
answered question		55
skipped question		31

Question 7

Was the information timely, accurate and helpful? (Choose as many as apply.)		
Answer Options	**Response Percent**	**Response Count**
Timely	74.5%	41
Accurate	74.5%	41
Helpful	81.8%	45
None of the above	0.0%	0
	answered question	55
	skipped question	31

Question 8

Do you/does your household have a 72-hour kit? (http://www.ready.gov/build-a-kit)		
Answer Options	**Response Percent**	**Response Count**
Yes	36.8%	21
Yes, but not complete	29.8%	17
Yes, but out of date	1.8%	1
No	31.6%	18
	answered question	57
	skipped question	29

Question 9

Do you have homeowner's/renter's insurance?		
Answer Options	**Response Percent**	**Response Count**
Yes	93.0%	53
No	7.0%	4
	answered question	57
	skipped question	29

Question 10

Does your insurance include flood insurance?		
Answer Options	**Response Percent**	**Response Count**
Yes	19.2%	15
No	80.8%	63
	answered question	78
	skipped question	8

Question 11

If you live in a Special Flood Hazard Area (SFHA), do you have floodplain insurance?		
Answer Options	**Response Percent**	**Response Count**
Yes	20.4%	10
No	79.6%	39
	answered question	**49**
	skipped question	**37**

Question 12

Are you willing to spend your money on mitigation activities for your home?		
Answer Options	**Response Percent**	**Response Count**
Yes	68.6%	48
No	31.4%	22
	answered question	**70**
	skipped question	**16**

Question 13

Have you performed any improvements to your home to reduce your risk from a hazard?		
Answer Options	**Response Percent**	**Response Count**
Yes	69.9%	51
No	30.1%	22
	answered question	**73**
	skipped question	**13**

Question14

Please indicate what improvements you have made.		
Answer Options	**Response Percent**	**Response Count**
Elevating the structure	7.4%	4
Tree maintenance/removal	74.1%	40
Roof repair/replacement	50.0%	27
Clearing underbrush	42.6%	23
Other (please specify)	22.2%	12
	answered question	54
	skipped question	32

Number	Response Date	Other (please specify)	Categories
1	May 13, 2016 1:40 PM	Replacing old siding for wind and cold events	
2	May 12, 2016 10:09 PM	Winterize	
3	May 3, 2016 5:53 PM	Generator	
4	Mar 1, 2016 10:38 PM	standby generator	
5	Feb 27, 2016 3:12 PM	Getting generator to keep pipes from freezing	
6	Feb 26, 2016 2:33 PM	whole home generator	
7	Feb 26, 2016 2:08 PM	generator	
8	Feb 26, 2016 1:48 PM	emergencey generator	
9	Feb 26, 2016 11:58 AM	Additional heating	
10	Feb 26, 2016 4:53 AM	Generator & water storage	
11	Feb 26, 2016 3:59 AM	Whole house generator	
12	Feb 26, 2016 1:03 AM	generator purchase	

Question 15

Age:		
Answer Options	**Response Percent**	**Response Count**
Under 18	1.3%	1
18-24	2.6%	2
25-34	13.2%	10
35-44	15.8%	12
45-54	27.6%	21
55-64	31.6%	24
65-74	6.6%	5
75 years or older	1.3%	1
	answered question	76
	skipped question	10

Question 16

Gender:		
Answer Options	**Response Percent**	**Response Count**
Male	42.9%	33
Female	57.1%	44
	answered question	77
	skipped question	9

Question 17

Please indicate your level of household income:		
Answer Options	**Response Percent**	**Response Count**
<$20,000	11.0%	8
>$20,000	1.4%	1
$20,001 - $40,000	17.8%	13
$40,001 - $60,000	24.7%	18
$60,001 - $80,000	16.4%	12
$80,001 - $100,000	11.0%	8
>$100,000	17.8%	13
	answered question	73
	skipped question	13

Question 18

Please indicate your level of education:		
Answer Options	**Response Percent**	**Response Count**
Less than a high school diploma	2.6%	2
High school diploma/GED	19.5%	15
Some college/trade school	35.1%	27
Associate's degree	10.4%	8
Bachelor's degree	15.6%	12
Graduate degree	16.9%	13
PhD	0.0%	0
	answered question	77
	skipped question	9

Question 19

Zip Code:	
Answer Options	**Response Count**
	72
answered question	**72**
skipped question	**14**

Number	Response Date	Response Text
9	Apr 25, 2016 3:48 PM	24901
11	Apr 15, 2016 2:40 AM	24901
12	Apr 14, 2016 8:44 PM	24901
47	Feb 26, 2016 11:58 AM	24901
50	Feb 26, 2016 5:30 AM	24901
51	Feb 26, 2016 4:54 AM	24901
53	Feb 26, 2016 4:00 AM	24901
60	Feb 26, 2016 12:30 AM	24901
54	Feb 26, 2016 3:42 AM	24910
55	Feb 26, 2016 3:36 AM	24910
46	Feb 26, 2016 12:28 PM	24915
1	May 13, 2016 1:40 PM	24920
37	Feb 26, 2016 2:09 PM	24920
2	May 12, 2016 11:50 PM	24924
48	Feb 26, 2016 11:52 AM	24925
64	Feb 26, 2016 12:19 AM	24925
5	May 11, 2016 11:15 PM	24927
38	Feb 26, 2016 2:00 PM	24927
63	Feb 26, 2016 12:24 AM	24931
14	Apr 12, 2016 4:59 PM	24934
32	Feb 26, 2016 2:42 PM	24934
4	May 12, 2016 12:43 PM	24944
3	May 12, 2016 10:09 PM	24946
26	Feb 27, 2016 3:12 PM	24946
6	May 11, 2016 9:44 PM	24954
7	May 11, 2016 6:29 PM	24954
8	May 3, 2016 5:53 PM	24954
15	Mar 25, 2016 2:15 PM	24954
25	Mar 1, 2016 4:20 AM	24954
27	Feb 27, 2016 3:47 AM	24954
28	Feb 26, 2016 10:07 PM	24954
30	Feb 26, 2016 3:14 PM	24954
31	Feb 26, 2016 3:04 PM	24954
33	Feb 26, 2016 2:33 PM	24954
34	Feb 26, 2016 2:21 PM	24954
35	Feb 26, 2016 2:15 PM	24954
36	Feb 26, 2016 2:14 PM	24954

40	Feb 26, 2016 1:24 PM	24954
41	Feb 26, 2016 1:22 PM	24954
43	Feb 26, 2016 1:12 PM	24954
44	Feb 26, 2016 12:52 PM	24954
45	Feb 26, 2016 12:40 PM	24954
49	Feb 26, 2016 10:47 AM	24954
56	Feb 26, 2016 2:23 AM	24954
66	Feb 26, 2016 12:15 AM	24957
62	Feb 26, 2016 12:24 AM	24962
58	Feb 26, 2016 1:03 AM	24966
10	Apr 15, 2016 3:08 PM	24970
65	Feb 26, 2016 12:18 AM	24970
17	Mar 9, 2016 1:49 PM	24986
61	Feb 26, 2016 12:28 AM	24986
21	Mar 3, 2016 4:19 PM	25136
20	Mar 7, 2016 1:24 PM	25880
39	Feb 26, 2016 1:48 PM	25901
70	Feb 24, 2016 6:29 PM	25901
42	Feb 26, 2016 1:13 PM	25958
16	Mar 24, 2016 7:36 PM	25962
23	Mar 1, 2016 10:39 PM	25979
13	Apr 14, 2016 6:46 PM	25984
52	Feb 26, 2016 4:27 AM	25984
57	Feb 26, 2016 1:09 AM	25984
59	Feb 26, 2016 12:33 AM	25984
18	Mar 8, 2016 12:57 PM	26201
22	Mar 2, 2016 3:24 PM	26218
29	Feb 26, 2016 5:23 PM	26282
19	Mar 7, 2016 3:06 PM	26288
24	Mar 1, 2016 7:01 PM	26452
67	Feb 25, 2016 8:06 PM	26610
69	Feb 24, 2016 7:26 PM	26610
68	Feb 25, 2016 4:27 PM	26651
71	Feb 24, 2016 6:16 PM	26651
72	Feb 24, 2016 5:53 PM	26651

Question 20

How long have you resided in your community?		
Answer Options	**Response Percent**	**Response Count**
Less than one year	1.3%	1
1-5 years	9.2%	7
6-10 years	13.2%	10
11-20 years	17.1%	13
More than 20 years	59.2%	45
answered question		**76**
skipped question		**10**

Question 21

Please feel free to provide any additional comment in the box below.	
Answer Options	**Response Count**
	6
answered question	**6**
skipped question	**80**

Number	Response Date	Response Text
1	May 13, 2016 1:42 PM	Once you plan for floods, winter events you should consider a "terror" event in DC area which will push people to PC as refugees. How do we house and care for them?
2	Feb 26, 2016 10:08 PM	I feel we get get as much assistance durning a emergency because we live in low income county.
3	Feb 26, 2016 5:00 AM	Nicole & social media alerts are great, but a little more info would be better... Instead of I-64 west bound closed due to Mva, maybe add tractor trailer overturned, will take approx. 2 hours to clear.
4	Feb 26, 2016 12:26 AM	It's a small town... Everyone wants to know what's going on. Preformed?? Please learn how to spell.
5	Feb 25, 2016 11:22 PM	our community need to have stream restoration.. to improve the chance of flooding in the east end of town from every time it rains it could flood
6	Feb 25, 2016 8:09 PM	Areas where rock slides and flooding are an apparent hazard are not well maintained,ex. removing overhangs and dredging streams on a regular basis.

APPENDIX 3: SOCIAL VULNERABILITY INFORMATION

The Social Vulnerability Index (SVI) tool was developed by the Centers for Disease Control and Prevention's (CDC) Agency for Toxic Substances and Disease Registry (ATSDR) to identify and map the subsets of the community that will most likely need more support before, during and after a disaster event. This tool is available for any user from the SVI website (http://svi.cdc.gov/) and runs on ESRI's ArcMap program.

The SVI uses variables that fall into four themes: socioeconomic, household composition, minority status/language, and housing/transportation. The variables are identified and described in the following tables. The variables are grouped by theme, which are color coded. Green variables are in the socioeconomic theme, household composition variables are orange, minority status/language variables are purple and housing/transportation variables are blue.

VARIABLE	DESCRIPTION
STATE_ABBR	State Abbreviation
STATE_NAME	State Name
FIPS	FIPS Code
LOCATION	Text description of tract, county, state
TOTPOP	Total population, 2010 SF1
E_TOTPOP	Population estimate, 2006-2010 ACS
M_TOTPOP	Population estimate MOE, 2006-2010 ACS
HU	Housing units, 2010 SF1
E_HU	Housing units estimate, 2006-2010 ACS
M_HU	Housing units estimate MOE, 2006-2010 ACS
HH	Number of households, 2010 SF1
E_POV	Persons below poverty estimate, 2006-2010 ACS
M_POV	Persons below poverty estimate MOE, 2006-2010 ACS
E_UNEMP	Civilian (age 16+) unemployed estimate, 2006-2010 ACS
M_UNEMP	Civilian (age 16+) unemployed estimate MOE, 2006-2010 ACS
E_PCI	Per capita income estimate, 2006-2010 ACS
M_PCI	Per capita income estimate MOE, 2006-2010 ACS
E_NOHSDIP	Persons (age 25+) with no high school diploma estimate, 2006- 2010 ACS
M_NOHSDIP	Persons (age 25+) with no high school diploma estimate MOE, 2006-2010 ACS
AGE65	Persons aged 65 and older, 2010 SF1
AGE17	Persons aged 17 and younger, 2010 SF1
SNGPRNT	Single parent household with children under 18, 2010 SF1
MINORITY	Minority (all persons except white, non-Hispanic), 2010 SF1

E_LIMENG	Persons (age 5+) who speak English "less than well" estimate, 2006-2010 ACS
M_LIMENG	Persons (age 5+) who speak English "less than well" estimate MOE, 2006-2010 ACS
E_MUNIT	Housing in structures with 10 or more units estimate, 2006- 2010 ACS
M_MUNIT	Housing in structures with 10 or more units estimate MOE, 2006-2010 ACS
E_MOBILE	Mobile homes estimate, 2006-2010 ACS
M_MOBILE	Mobile homes estimate MOE, 2006-2010 ACS
E_CROWD	At household level, more people than rooms estimate, 2006- 2010 ACS
M_CROWD	At household level, more people than rooms estimate MOE, 2006-2010 ACS
E_NOVEH	Households with no vehicle available estimate, 2006-2010 ACS
M_NOVEH	Households with no vehicle available estimate MOE, 2006- 2010 ACS
GROUPQ	Persons in institutionalized group quarters, 2010 SF1
E_P_POV	Proportion of persons below poverty estimate
M_P_POV	Proportion of persons below poverty estimate MOE
E_P_UNEMP	Proportion of civilian (age 16+) unemployed estimate
M_P_UNEMP	Proportion of civilian (age 16+) unemployed estimate MOE
E_P_PCI	Per capita income estimate, 2006-2010 ACS
M_P_PCI	Per capita income estimate MOE, 2006-2010 ACS
E_P_NOHSDIP	Proportion of persons with no high school diploma (age 25+) estimate
M_P_NOHSDIP	Proportion of persons with no high school diploma (25+) estimate MOE
P_AGE65	Proportion of persons aged 65 and older
P_AGE17	Proportion of persons aged 17 and younger
P_SNGPRNT	Proportion of single parent households with children under 18
P_MINORITY	Proportion minority (all persons except white, non-Hispanic)
E_P_LIMENG	Proportion of persons (age 5+) who speak English "less than well" estimate
M_P_LIMENG	Proportion of persons (age 5+) who speak English "less than well" estimate MOE
E_P_MUNIT	Proportion of housing in structures with 10 or more units estimate
M_P_MUNIT	Proportion of housing in structures with 10 or more units estimate MOE
E_P_MOBILE	Proportion of mobile homes estimate
M_P_MOBILE	Proportion of mobile homes estimate MOE
E_P_CROWD	Proportion of households with more people than rooms estimate
M_P_CROWD	Proportion of households with more people than rooms estimate MOE
E_P_NOVEH	Proportion of households with no vehicle available estimate
M_P_NOVEH	Proportion of households with no vehicle available estimate MOE
P_GROUPQ	Proportion of persons in institutionalized group quarters
E_PL_POV	Percentile of the proportion of persons below poverty estimate, no consideration of MOE
E_PL_UNEMP	Percentile of the proportion of civilian (age 16+) unemployed estimate, no consideration of MOE
E_PL_PCI	Percentile of per capita income estimate, no consideration of MOE

E_PL_NOHSDIP	Percentile of the proportion of persons with no high school diploma (age 25+) estimate, no consideration of MOE
S_PL_THEME1	Sum of E_PLxxx series for Socioeconomic theme
R_PL_THEME1	Percentile ranking for Socioeconomic theme
PL_AGE65	Percentile of the proportion of persons aged 65 and older
PL_AGE17	Percentile of the proportion of persons aged 17 and younger
PL_SNGPRNT	Percentile of the proportion of single parent households with children under 18
S_PL_THEME2	Sum of PLxxx series for Household Composition theme
R_PL_THEME2	Percentile ranking for Household Composition theme
PL_MINORITY	Percentile of the proportion minority (all persons except white, non-Hispanic)
E_PL_LIMENG	Percentile of the proportion of persons (age 5+) who speak English "less than well" estimate, no consideration of MOE
S_PL_THEME3	Sum of PLxxx series for Minority Status/Language theme
R_PL_THEME3	Percentile ranking for Minority Status/Language theme
E_PL_MUNIT	Percentile of the proportion of housing in structures with 10 or more units estimate
E_PL_MOBILE	Percentile of the proportion of mobile homes estimate
E_PL_CROWD	Percentile of the proportion of households with more people than rooms estimate
E_PL_NOVEH	Percentile of the proportion of households with no vehicle available estimate
PL_GROUPQ	Percentile of the proportion persons in institutionalized group quarters
S_PL_THEME4	Sum of PLxxx series for Housing/Transportation theme
R_PL_THEME4	Percentile ranking for Housing/Transportation theme
S_PL_THEMES	Sum of PLxxx series themes
R_PL_THEMES	Overall percentile ranking
F_PL_POV	Flag - for poverty, the proportion is in the 90th percentile (1= yes, 0 = no)
F_PL_UNEMP	Flag - for civilian unemployed, the proportion is in the 90th percentile (1 = yes, 0 = no)
F_PL_PCI	Flag - for per capita income, the proportion is in the 90th percentile (1 = yes, 0 = no)
F_PL_NOHSDIP	Flag - for no high school diploma, the proportion is in the 90th percentile (1 = yes, 0 = no)
F_PL_THEME1	Sum of flags for Socioeconomic Status theme
F_PL_AGE65	Flag - the proportion of persons aged 65 and older is in the 90th percentile (1 = yes, 0 = no)
F_PL_AGE17	Flag - the proportion of persons aged 17 and younger is in the 90th percentile (1 = yes, 0 = no)
F_PL_SNGPRNT	Flag - the proportion of single parent households is in the 90th percentile (1 = yes, 0 = no)
F_PL_THEME2	Sum of flags for Household Composition theme
F_PL_MINORITY	Flag - the proportion of minority is in the 90th percentile (1= yes, 0 = no)

F_PL_LIMENG	Flag - for limited English, the proportion is in the 90th percentile (1 = yes, 0 = no)
F_PL_THEME3	Sum of flags for Minority Status/Language theme
F_PL_MUNIT	Flag - for multi-unit housing, the proportion is in the 90th percentile (1 = yes, 0 = no)
F_PL_MOBILE	Flag - for mobile homes, the proportion is in the 90th percentile (1 = yes, 0 = no)
F_PL_CROWD	Flag - for crowded housing, the proportion is in the 90th percentile (1 = yes, 0 = no)
F_PL_NOVEH	Flag - for no vehicle access, the proportion is in the 90th percentile (1 = yes, 0 = no)
F_PL_GROUPQ	Flag - the proportion of persons in institutionalized group quarters is in the 90th percentile (1 = yes, 0 = no)
F_PL_THEME4	Sum of flags for Housing/Transportation theme
F_PL_TOTAL	Sum of flags for the four themes

APPENDIX 4: INACTIVE PROJECTS

This appendix contains those projects that have been listed as either Completed, Deleted, or Deferred. The projects are grouped by county, and have the project number assigned to them in the previous HMP update, where applicable.

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
2B.1.1	Misc.	N/A	Develop more in depth municipal asset list to better understand the value of structures within the town			Municipal Council	Fayette County Office of Emergency Services (FCOES)	Emergency Services	Part of regular operations	
Status: Completed**.** A community asset inventory was completed by WVU Capstone Students Identifying historical and tourism assets for long term economic opportunities. The Town has successfully removed eight dilapidated structures from the community.										
N/A	Misc.	N/A	Adopt the Fayette County Comprehensive Land Use and Zoning Plan			Municipal Council			Little to no cost to adopt and enforce	Local funding
Status: Completed. This project was not in the prior project list, but has been completed within the life of the previous Hazard Mitigation Plan update. The Town Council adopted the Fayette County Comprehensive Land Use and Zoning Plan which classified all properties within the municipality into specific land use categories. We now have specific allowable uses for all properties. The adoption of ordinance has improved the allowed uses of property and resulted in control of lot sizes, the removal of all Bill Boards from the community and creation of “public use areas” particularly in flood prone areas in and near the Floodplain. The zoning regulations include standards on controlling surface water issues by establishing standards for driveway culvert placement and size. The Building codes have been strengthened by requiring all new residential construction (including manufactured homes) to meet standards for downspouts and distribution of associated storm water. The requirement for Floodplain evaluation is now required for all new construction and permitting.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
2I.1.3	Winter Weather		Develop and implement programs to keep trees from threatening lives, property and public infrastructure during severe storm events			Utility Companies	Utility Companies	Prevention	Should require little to no additional funding	
Status: Deleted. Duplication of effort.										
3I.1.1	Thunderstorms		Maintain the county Wireless Emergency notification system			GCEMA	Greenbrier County Commission	Emergency Services	Up to $30,000 annually	Local Funding
Status: Completed**.** Two mass notification systems are in place – WENS and Nixle										
4I.1.1	Mass Movement		Publicize the location of karst geologic formations along with the hazards associated.			Greenbrier County Planning	GCEMA	Public Education and Awareness	No additional funding	
Status: Deleted. Planning Department relates that this is not needed.										
5I.1.1	Mass Movement		Continue to monitor identified areas in Greenbrier County that have limestone deposits or underground mining that may create sink holes. Update GIS database as necessary			Greenbrier County Planning	Greenbrier County Assessor	Public Education and Awareness	No additional funding	
Status: Deleted. Planning Department relates that this is not needed.										
7I.4,1	Misc.		Find a water resource (e.g. dry hydrants) for volunteer fire departments that is strategically located for fast response. Make this resource know to fire departments			Local Volunteer Fire Departments (VFDs)	GCEMA	Emergency Services	Should require little to no additional funding	
Status: Deleted. Determined to not be necessary.										
	Misc.		Purchase and place in service a mobile communications vehicle for use in Greenbrier County and the region.			GCEMA		Emergency Services	$300,000	Homeland Security Funding
Status: Completed. This project was not Included in the prior HMP update but has been completed within that cycle. The communications vehicle has satellite phone and internet capability and can be used to establish a communications post quickly after a disaster event. The vehicle can also be used to enhance communications at large events, such as the State Fair of West Virginia, Boy Scout Jamborees, Bridge Day, and the Friends of Coal Festival.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
1K.1.1	Flooding		Design and construct an inter-connect between Lewisburg and Ronceverte to help provide water if one plant is shut down due to contamination/damages from flooding			Lewisburg Public Works	Ronceverte Public Works, Region 4 PDC	Structural Projects	Up to $500,000	CDBG, Local Funding
Status: Deleted. Project has been deemed unfeasible per a SWPP Contingency Study performed for the city.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
1X.1.1	Flooding		Design and construct an interconnect between Lewisburg and Ronceverte to help provide water if one plant is shut down due to contamination/damages from flooding.			Ronceverte Public Works	Lewisburg Public Works, Region 4 PDC	Structural Projects	Up to $500,000	CDBG, Local Funding
Status: Deleted. The Ronceverte water plant was closed in 2009, all water is bought from Lewisburg.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
2J.1.1	Misc.		Either adopt the county emergency operations plan or develop a town-specific operations plan that is fully consistent with the county plan			PCOEM	Hillsboro Town Council	Emergency Services	Up to $5,000 if a contractor is used	EMPG, HSGP, Local Funding
Status: Completed, Hillsboro has adopted the Pocahontas County Emergency Operations Plan.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
Marlinton 4	Flooding	4	Construct flood levees along the Greenbrier Rive in Marlinton	November 2016	November 2021	Marlinton Town Council	U.S. Army Corps of Engineers (USACE)	Structural Projects	Approx. $1,000,000	HMGP, State Funding, Local Funding
Status: Differed. Not believed to be a viable project within the next five years.										

Project #	Hazard	Project Priority	Strategy	Start Date	End Date	Primary Coord.	Support Agencies	Mit. Type	Est. Cost	Resources
	Flooding		Supply schools, municipal agencies and other critical facilities with informational products on the meaning of announcements and advice on what actions to take			WCOES	Webster County LEPC	Public Education and Awareness	Up to $2,500	PDM, EMPG, SERC, HMEP, Local Funding
Status: Completed										
	Dam Failure		Coordinate with the SCS to develop a map showing areas that could be affected by a dam failure			WCOES	SCS, WVDEP	Emergency Services	No additional local funding	
Status: Completed										
	Flooding		Coordinate county efforts to meet the requirements of becoming a participant in the Community Rating System			Webster County Floodplain Coordinator	WCOES, Webster County Commission	Property Protection	No additional funding required	
Status: Deferred, not seen as feasible at this time.										
	Flooding		Coordinate with USDHS/FEMA and the WVDHSEM to complete the flood map modernization project			Webster County Floodplain Coordinator	FEMA	Property Protection	No additional funding required	
Status: Deferred										

APPENDIX 5: ADOPTING RESOLUTIONS

This appendix contains copies of the resolutions signed and adopted by each participating jurisdiction.

APPENDIX 6: CITATIONS

2014 Elk River chemical spill. (n.d.) Retrieved April 14th. 2016 from https://en.wikipedia.org/wiki/2014_Elk_River_chemical_spill

Adams, D. (2014, August 13.) Natural gas pipeline plan riles Floyd County. *The Roanoke Times.* Retrieved from http://www.roanoke.com/news/local/floyd_county/natural-gas-pipeline-plan-riles-floyd-county/article_3914934b-b5a1-5c4a-8f7d-d0a04fd5e74a.html

Agency for Toxic Substances and Disease Registry. (2010.) *SVI 2010 Database* [data file.] Retrieved from http://svi.cdc.gov/SVIDataToolsDownload.html

American Society of Civil Engineers. (2013.) *2013 Report Card for America's Infrastructure: Dam Section.* Retrieved from http://www.infrastructurereportcard.org/a/#p/dams/conditions-and-capacity

Associated of State Dam Safety Officials. (2012.) *Living With Dams: Know Your Risks.* Retrieved from http://www.damsafety.org/resources/downloads/?p=92fc7963-aa9e-4f6f-9f02-2b19cdda4422

Bedard Consulting, LLC. (2013.) *Rainelle Comprehensive Plan.* Retrieved from http://www.rainelle-wv.com/planning-and-zoning/

Bureau of Labor Statistics. (2015.) *County Data* [data file]. Retrieved from http://www.bls.gov/lau/#tables

City of Fayetteville. (2013.) *Fayetteville Comprehensive Plan Update.* Retrieved from https://fayettevilleplan.files.wordpress.com/2013/09/entire-draft-plan.pdf

CIty of Summersville. (2013.) *Summersville Comprehensive Plan.* Retrieved from http://www.summersvillewv.org/web_copy/Final_Plan.pdf

Dean Runyan Associates. (2013.) *Economic Impact of Travel on West Virginia 2000-2012 Detailed State and County Estimates.* Portland, Oregon. Retrieved from http://www.deanrunyan.com/doc_library/WVImp.pdf

Dewberry (2013.) *2013 West Virginia Statewide Standard Hazard Mitigation Plan Update.* Retrieved from http://www.dhsem.wv.gov/MitigationRecovery/Documents/2013%20WV%20Statewide%20Hazard%20Mitigation%20Plan%20Update.pdf

Emergency Planning and Citizen Right to Know Act of 1984, 44 U.S.C. § 11001 et seq. (2011). Retrieved from: https://www.gpo.gov/fdsys/pkg/USCODE-2011-

title42/html/USCODE-2011-title42-chap116.htm

Environmental Protection Agency. (2015.) *Drought*. Retrieved from https://www.epa.gov/natural-disasters/drought

Federal Emergency Management Agency (FEMA). (2014). Are you ready? An in-depth guide to civilian preparedness (IS-22). Retrieved from: http://www.fema.gov/media-library/assets/documents/7877

FEMA Region 3. (2016.) *Total Exposure in Floodplain (TEIF) 2.0.* [Data file.]

Greenbrier County Planning Commission. (2014.) *Greenbrier County Comprehensive Plan.* Retrieved from http://greenbriercounty.net/comp-plan/

Haddow, G.D., Bullock, J.A., & Coppola, D.P. (2014). Introduction to emergency management (5th ed.). Waltham, MA: Butterworth-Heinemann.

Hamill, G. (2015, March 4). Snowstorm costs Marlinton more than $25,000. *The Pocahontas Times.* Retrieved from http://pocahontastimes.com/snowstorm-costs-marlinton-more-than-25000/

Health Resources & Services Administration. *Various sections*. Accessed at http://www.hrsa.gov/index.html

Highway Loss Data Institute. (2012.) *Hail-related claims under comprehensive coverage.* Retrieved from http://www.iihs.org/media/a1aebe8a-9c5e-4d1a-8310-d19fbc1bc70f/1119311205/HLDI%20Research/Bulletins/hldi_bulletin_29.3.pdf

Horton, R., G. Yohe, W. Easterling, R. Kates, M. Ruth, E. Sussman, A. Whelchel, D. Wolfe, and F. Lipschultz. (2014) *Ch. 16: Northeast. Climate Change Impacts in the United States: The Third National Climate Assessment*. Retrieved from http://s3.amazonaws.com/nca2014/low/NCA3_Full_Report_16_Northeast_LowRes.pdf?download=1

Medina, Angeli. (2016). Promoting a culture of disaster preparedness*. Journal of Business Continuity & Emergency Planning*, 9 (3), 281-290.

Mountain Transit Authority. *Schedules/Fares*. Accessed at http://www.mtawv.com/schedulesfares/

Mountain Valley Pipeline. *Maps.* Retrieved from http://mountainvalleypipeline.info/maps/

Mountain Valley Pipeline. *Project Schedule.* Retrieved from http://mountainvalleypipeline.info/project-schedule/

National Floodplain Insurance Program. Community status book report. Retrieved from: http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book

National Severe Storms Laboratory. *Severe Weather 101 – Hail.* Retrieved from http://www.nssl.noaa.gov/education/svrwx101/hail/

National Weather Service. (2007) National weather service instruction 10-605. (Operations and Services Performance, NWSPD 10-16). Retrieved from: https://www.ncdc.noaa.gov/stormevents/pd01016005curr.pdf

New River Transit Authority. *Bus Schedules.* Accessed at http://newrivertransitauthority.org/bus-schedules/

NOAA National Climactic Data Center (NCDC). Thunderstorm wind history. Retrieved from: http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=54%2CWEST+VIRGINIA

NOAA National Climatic Data Center Storm Events Database. *Drought Events* [Data Set]. Retrieved from https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

NOAA National Climatic Data Center Storm Events Database. *Extreme Temperature Events* [Data Set]. Retrieved from https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

NOAA National Climatic Data Center Storm Events Database. *Flooding Events* [Data Set]. Retrieved from https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

NOAA National Climatic Data Center Storm Events Database. *Hail Events* [Data Set]. Retrieved from https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

NOAA National Climatic Data Center Storm Events Database. *Land Subsidence Events* [Data Set]. Retrieved from https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

NOAA National Climatic Data Center Storm Events Database. *Lightning Events* [Data Set]. Retrieved from https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

NOAA National Climatic Data Center Storm Events Database. *Tornado Events* [Data Set]. Retrieved from https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

NOAA National Climatic Data Center Storm Events Database. *Wildfire Events* [Data Set]. Retrieved from

https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

NOAA National Climatic Data Center Storm Events Database. *Wind Events* [Data Set]. Retrieved from https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

NOAA National Climatic Data Center Storm Events Database. *Winter Weather Events* [Data Set]. Retrieved from https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=39%2COHIO

Palmer Drought Index. (n.d.). Retrieved January 7, 2016 from Wikipedia: https://en.wikipedia.org/wiki/Palmer_drought_index

Plummer, Sarah. (2016, January 23). Locals dig out after first day of storm. *The Fayette Tribune.* Retrieved from http://www.fayettetribune.com/news/locals-dig-out-after-first-day-of-storm/article_990339d2-c203-11e5-beeb-5f6347ab1805.html

Public Service Commission of West Virginia. *Various utility data.* Retrieved from http://www.psc.state.wv.us/utilities/default.htm

Silver Airways. *Silver Airways Timetable*. Accessed at http://www.silverairways.com/docs/site/Timetable/timetable---january-2015.pdf

Sirk/Ford Initiative, LLC. (2011.) *2011 Comprehensive Plan Amendment Fayette County, WV.* Retrieved from http://www.fayettecounty.wv.gov/Documents/2011_Fayette_County_WV_Comprehensive_Plan_Amendment.pdf

Sirk/Ford Initiative, LLC. (2012.) *Update to the 1968 Comprehensive Plan.* Retrieved from http://cityofoakhill.homestead.com/Oak_Hill_Comprehinsive_Plan.pdf

Stanford University National Performance of Dams Program. *NPDP Dam Incident Database* [Data file.] Retrieved from http://npdp.stanford.edu/dam_incidents

Trask, Jason A. (2015). An academic approach to climate change emergency preparedness. *Journal of Business Continuity & Emergency Planning,* 9(2), 119-128.

U.S. DOT Pipeline and Hazardous Materials Safety Administration (PHMSA). Incident statistics. Retrieved from: http://phmsa.dot.gov/hazmat/library/data-stats/incidents

United States Census Bureau. (2015.) *American Fact Finder* [data file]. Retrieved from http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

United States Census Bureau. (2015.) *County Business Patterns* [data file]. Retrieved from http://www.census.gov/econ/cbp/

United States Geological Society. (2016.) *Earthquake Hazards Program.* Retrieved from http://earthquake.usgs.gov/earthquakes/

USDA Agricultural Research Service. *Plant Hardiness Zone Map.* Retrieved from http://planthardiness.ars.usda.gov/PHZMWeb/

USDA National Agricultural Statistics Service. *Quick Stats* [Data file.] Retrieved form http://quickstats.nass.usda.gov/

Verisk Insurance Solutions. (2014.) *Property Hail Claims in the United States: 2000-2013.* Retrieved from http://www.verisk.com/verisk/cls/landing/hail/hail-claims-report-verisk-insurance-solutions-underwriting.html

West Virginia Coalition to End Homelessness. (2015.) *West Virginia Point in Time Count Statewide Report January 2015.* Retrieved from http://wvceh.org/uploads/default/default2015_Statewide_PIT_Count_Report-FINALhq.pdf

West Virginia Department of Environmental Protection. (2009.) *West Virginia Definition of a Dam – Exemptions.* Retrieved from http://www.dep.wv.gov/WWE/ee/ds/Documents/Definition%20of%20a%20Dam-v4.pdf

West Virginia Geological & Economic Survey. (2016.) *Earthquake Epicenters of West Virginia: 1824 through 2016.* [Data file.] Retrieved from http://www.wvgs.wvnet.edu/www/earthquakes/seismic.html#Map

West Virginia Highlands Conservancy. (2002). Timbering and flooding in Fayette County, West Virginia. Charleston, WV: John M. Brown.

Wildland Fire Assessment System (2015) Observed fire class. Retrieved from http://www.wfas.net/index.php/fire-danger-rating-fire-potential--danger-32

WVU LAW Land Use & Sustainable Development Law Clinic. (2015.) *City of Lewisburg Comprehensive Plan.* Retrieved from http://www.lewisburg-wv.com/DocumentCenter/ComprehensivePlan.aspx