Andrew County, MO

Hazard Mitigation Plan

11/14/2016 Amended 8/30/2019 Amended 9/16/2019

Mo-Kan Regional Council 224 North 7th Street St. Joseph, MO 64501 <u>www.mo-kan.org</u>

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Appendix A: Adoption Resolution

Andrew County

Amazonia

Bolckow

Cosby

Country Club

Fillmore

Rea

Rosendale

Savannah

Avenue City School District

North Andrew School District

Savannah School District

Rosendale Fire Protection District

Andrew County Health Department

Appendix B: Maps and Reports

Hydrological Features

Essential Facilities

Transportation Routes

Dam Locations and Hazard Level

Dysart Lake Dam Potential Inundation Boundary Happy Holler Dam Potential Inundation Boundary Keller Lake Dam Potential Inundation Boundary Lake La Verne Dam Potential Inundation Boundary Savannah City Reservoir Dam Potential Inundation Boundary Schweizer Lake Dam Potential Inundation Boundary Smith Lake Dam Potential Inundation Boundary Thompson Lake Dam Potential Inundation Boundary Amazonia 100-Year Flood Boundary Bolckow 100-Year Flood Boundary Rosendale 100-Year Flood Boundary Andrew County 100-Year Flood Boundary Sinkholes Cropland and Grassland Hazus-MH: Flood Event Report

Appendix C: Public Involvement

Sample Letters to Planning Committee Members Hazard Mitigation Timeline Public Meeting Flyers Newspaper Coverage Public Meeting Presentation Community Profile Worksheet Cascading Hazards Worksheet Hazard Analysis Worksheet Ranking of Mitigation Methods Worksheet STAPLEE Criteria and Evaluation Worksheet Planning Committee Sign-In Sheets and In-Kind Documentation

Andrew County Hazard Mitigation Plan

The basis for authority to create a natural hazard mitigation plan lies in Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165. This legislation was enacted under Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000), P.L. 106-390. Section 104 is the legal basis for the Federal Emergency Management Agency's (FEMA) Interim Final Rule for 44 CFR Parts 201 and 206, published in the Federal Register on February 26, 2002.

This plan is an update of the original plan, which was approved by FEMA and adopted by Andrew County jurisdictions in 2011. Andrew County's first Hazard Mitigation Plan (HMP) was approved by FEMA in 2005.

Stafford Act Impact

The Stafford Act allows jurisdictions like Andrew County that have an approved hazard mitigation plan to be eligible for federal hazard mitigation funds. The Stafford Act was amended in 2007 to include school and special districts. To be eligible, each jurisdiction must participate in the multi-jurisdictional planning process and adopt the revised plan.

Assurance Statements of Compliance

This multi-jurisdictional mitigation plan complies with the planning guidance for the Missouri State Emergency Management Agency (SEMA) and FEMA's; FEMA regulations, rules, guidelines, and checklists; Code of Federal Regulations; and existing federal and state laws; and other reasonable criterion as Congress, state legislators and SEMA/FEMA may establish in consultation with local governments while the plan is being developed.

This plan also meets the minimum planning requirements for all FEMA mitigation programs, such as Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) and Pre-Disaster Mitigation (PDM) and where appropriate, other FEMA mitigation related programs such as the National Earthquake Hazards Reduction Program (NEHRP), the National Flood Insurance Program (NFIP) and the Community Rating System (CRS).

Planning Process

The citizens of Andrew County and their elected representatives provided the basis of this plan through their involvement, which was coordinated by the Mo-Kan Regional Council (Mo-Kan).

SEMA contracted the Missouri Association of Councils of Government (MACOG) to develop and revise the hazard mitigation plans in conjunction with local governments. The 19 regional planning commissions of MACOG provide an effective method for local governments to work together to share technical staff and address common problems in need of an area-wide approach. They also can effectively deliver programs that might be beyond the resources of an individual county or municipal government. The intent of the regional planning commissions in Missouri is to be of service to their member counties and municipalities and to bring an organized approach to addressing a broad cross-section of area-wide issues. They also are available to assist their member entities in coordinating the needs of the area with state and federal agencies or with private companies or other public bodies.

Most of the rural regional planning commissions in Missouri were formed under Chapter 251 of the Revised Statutes of the State of Missouri. All regional councils in Missouri operate as "quasi-governmental" entities. In Missouri, regional planning commissions are advisory in nature, and county and municipal governments hold membership on a voluntary basis.

Through SEMA's scope of work, Andrew County contracted Mo-Kan Regional Council to prepare its Hazard Mitigation Plan. Mo-Kan provides services to county and municipal governments in four counties in Missouri and two counties in Kansas.

In accordance with Missouri's Sunshine Law (RSMo 610.010, 610.020, 610.023, and 610.024), the plan will be presented for public review and comment. The public has been encouraged to participate in the process.

All jurisdictions within Andrew County were informed of the planning process and encouraged to participate. This was achieved through individual contact with officials from each jurisdiction, including but not limited to the county, communities and school districts.

Hazard Mitigation Planning Committee		
Jurisdiction	Name	
Andrew County	Bob Caldwell, Presiding Commissioner	
	Ray Furst, Commissioner	
	Darryl Howard, Commissioner	
	Roger Latham, Emergency Management Director	
	George Birdsong, Emergency Management Director In-	
	Training	
	Sarah Miller, County Clerk	
	Bryan Atkins, Sheriff	
	Andrew Hoffman, Administrator	
	Lesley Schulte, Public Health Emergency Response	
City of Amazonia	Rick Russell, Mayor	
Avenue City School District	Becky Grimes, Superintendent	
Village of Bolckow	Cliff Watts, City Clerk	
Village of Cosby & Cosby-Helena Fire	Jon Neely, Mayor	
Department	Teresa Neely, City Clerk	
	Dennis Ford, Fire Fighter	
Village Country Club	Gary Chambers, City Clerk	
City of Fillmore	Ron Lance, Fillmore Fire Department	
	Marilyn Lance, Fillmore Fire Department	
North Andrew School District	Jim Schultz, Superintendent	
Village of Rea	Kathy Roach, City Clerk	
City of Rosendale & Fire Department	Robert Rowe, Rosedale Fire Department	
	Daniel Brewer, Rosendale Fire Department	
	Garry Pittman, Rosendale Fire Department	
Savannah School District	Dr. David Brax, Superintendent	
City of Savannah	Bruce Lundy, City Administrator /Police Lieutenant	
Northwest Health Services	Rodney Hummer, Clinic Manager	
University of Missouri Extension Office	e Jim Humphrey, Associate Extension Professional & Live	
	Stock Specialist	

Participation

Each jurisdiction in Andrew County was invited and encouraged to participate in the development of this plan. DMA 2000 requires that jurisdictions represented by a multi-jurisdictional plan participate in the planning process and formally adopt the plan. Each participating jurisdiction was required to meet plan participation requirements as defined by the planning committee at the beginning of the process.

At its initial meeting, the planning committee decided that to participate in the plan, each jurisdiction must try to be present at two of the planning meetings, or be in contact with Mo-Kan staff and submit worksheets. All jurisdictions met participation requirements. Two of the planning meeting dates conflicted with school board meetings, making it difficult for superintendents to attend, but they stayed in close contact with Mo-Kan staff throughout the process. Representatives from Amazonia and County Club Village did not attend the planning meetings, but Mo-Kan staff met with their City Councils and held work sessions. Two other communities, Rea and Bolckow, did not attend planning meetings as well but both jurisdictions completed the Community Data Questionnaire and were in contact with Mo-Kan staff.

Elected officials, concerned citizens, law enforcement and public safety personnel, city and county staff members, Mo-Kan staff and volunteers have participated in this hazard mitigation planning process. They have planned meetings, completed worksheets, supplied research and data, and communicated with Mo-Kan staff. Documentation in the form of sign-in sheets for attendance as well as time sheets for group meetings is included in Appendix C.

Planning Meetings

This plan is an update of the 2011 plan. The first Andrew County Hazard Mitigation Plan was adopted in 2005. Throughout the planning process, the plan was reviewed and has been revised.

The initial planning meeting for updating the plan was held August 25, 2015, at the Andrew County Sheriff's Office and Jail. At this meeting, the hazard mitigation process was outlined to members of the planning committee. The committee reviewed the 2011 Hazard Mitigation Plan. Members of the planning committee began working on detailed profiles of their respective jurisdictions. When the plan was updated in 2011, at that time the planning

committee recognized the importance of public input and confirmed that public outreach would be an important aspect of the updated plan. The emergency management director gave an example of a successful action; during the last plan's update the county purchased weather radios to sell to the public for \$10.00. This action made the weather radios affordable for households (primarily low and moderate income) and churches to purchase and the radios were an effective and low cost method of notifying the public of an imminent threat.

The second planning meeting was held September 8, 2015, at the Andrew County Sheriff's Office and Jail. At this meeting the committee received hazard analysis worksheets and asked to complete a cascading disaster analysis. Planning committee members also reviewed mitigation goals and actions of the 2011 plan. The committee agreed to change Goal Two's first objective from "decrease the *occurrence* of disasters" to "decrease the *impact* of disasters". They felt the previous verbiage could be misunderstood to claim that the plan could reduce the number of disasters, such as tornados and severe storms, and that the word "impact" better described the mitigation focus of the objective.

There was discussion about the current FEMA funded grant project at the local Boy Scout Camp, Camp Geiger, where a series of storm shelters are under construction. Wide-spread acknowledgement for the need for storm shelters at the sprawling camp ground occurred during a 2011 HMP planning meeting, which materialized into the current project. There was also discussion regarding two of Andrew County's school districts submitting NOIs (Notice of Intent) for building hardened school gyms and how the grant process works. The emergency management director explained to new members of the planning committee how participation in the plan helps communities learn about funding options for mitigation projects.

The third planning meeting was held on October 13, 2015, at the Andrew County Sheriff's Office and Jail. The committee discussed which goals had been achieved, which should be continued and which were no longer applicable. Some of the topics discussed were the fire department's noon tests throughout the county, the community of Rosendale's need for a new outdoor storm warning siren and the role of storm spotters. In addition, new action plans were discussed. The dates for submitting evaluations of the previous actions and forms for new actions were set. Jurisdictions were informed of the adoption process for the plan and it was

agreed upon that the plan would first be adopted by the Andrew County Commission before other jurisdictions could adopt the plan.

Throughout the process, Mo-Kan staff was in contact with representatives from each of the jurisdictions to obtain information for each portion of the plan. Jurisdictions that were not able to attend planning or public meetings were in contact with Mo-Kan staff to provide information and participated in the formulation of the plan.

On October 8, 2015, a work session was held with Andrew County Commissioners and Emergency Management staff to evaluate actions from the former plan and to discuss actions for the updated plan.

On December 3, 2015, a work session was held with the City Clerk of County Club Village at Country Club Village City Hall. The community data questionnaire and evaluations of the previous plan was collected and other relevant information was discussed. The following week, Mo-Kan staff spoke before the Country Club Village City Council at their city hall to discuss the plan, ask for input and explain the adoption process.

On December 7, 2015, a work session was held with Amazonia's City Council at the Lion's Club. Community needs were discussed at this meeting. The main focus was the need for a new outdoor storm warning siren. The plan was discussed, input was requested and the adoption process was explained. On December 10, 2015, the Amazonia mayor met with Mo-Kan staff to evaluate former actions and discuss updates.

Public Involvement and Outreach

Input from the public and stakeholders were received at public meetings as well as other informational gatherings. Documentation in the form of sign-in sheets and time sheets for attendance for the above mentioned events are included in Appendix C.

Andrew County Commissioners, Mo-Kan staff and the emergency management director attended a series of Back-to-School Nights as part of the public outreach effort. At these meetings the public was invited to participate in the hazard mitigation plan process and provided information on how to create a home emergency plan. These events occurred on: August 17, 2015, at John Glenn Elementary School, County Club Village August 17, 2015, at Avenue City Elementary School, Helena August 17, 2015, Helena Elementary School, Cosby

August 17, 2015, Minnie Cline Elementary School, Savannah

August 18, 2015, Savannah High School, Savannah

August 19, 2015, North Andrew, Rosendale

The August 17, 2015, meeting at the Avenue City School had an additional component that the other Back-to-School nights did not. The county's presiding commissioner held a community meeting with parents and teachers regarding the hazard mitigation plan. The school had recently constructed a hardened gym for a tornado shelter, which was toured by parents during the meeting.

Another public meeting was held on September 15, 2015, at the Andrew County Sheriff's Office and Jail. The meeting was open to the public and was attended by staff of the Andrew County Sheriff Department. The *Savannah Reporter*, the local weekly newspaper advertised the meeting. The discussion focused on the plan in general and the role of the sheriff's office in its implementation.

On October 22, 2015, a public meeting was held at the Andrew County's Senior Center. The meeting was open to the public and the *Savannah Reporter*, the local weekly newspaper, advertised the meeting (Appendix C). Discussion focused on the hazard mitigation plan, the special concerns of seniors and creating a home emergency plan. Other discussion topics included what the contingency plan is in case the water reservoir is not available and where people living in a mobile home park should go when the public tornado shelters (fire station, courthouse, etc.) are closed at night.

The Local Emergency Planning Committee was also involved in the planning process. At their January 28, 2016, the committee evaluated the actions they were responsible for completing. Although no new actions were created, several current actions were modified to increase their effectiveness.

Through the use of public notices and newspaper advertisements members of the public were made familiar with hazard mitigation planning and the involvement of Andrew County and jurisdictions. During the planning process there was discussion about how jurisdictions and individuals could participate, what the benefits to mitigation are and how to make use of the grant funding opportunities.

Adoption by Local Governing Bodies

To demonstrate commitment towards fulfilling hazard mitigation goals, local jurisdictions must formally adopt this hazard mitigation plan. The plan must be adopted for the jurisdiction to be eligible to apply for and/or receive project grants under the Hazard Mitigation Grant Program, Pre-Disaster Mitigation, Flood Mitigation Assistance and Severe Repetitive Loss programs.

All of the original plan participants are involved in the updated plan. The "X" indicates the jurisdiction has completed the corresponding activity.

Hazard Mitigation Participation by Jurisdiction						
Jurisdiction	Meetings	Worksheets	In contact with Mo- Kan staff	Work sessions	Formal Adoption	Status
Andrew County	Х	Х	Х	Х	Х	Continuing
Amazonia		Х	Х	Х	Х	Continuing
Avenue City R-9 School District		Х	Х		Х	Continuing
Bolckow		Х	Х		Х	Continuing
Cosby	Х	Х	Х		Х	Continuing
Country Club Village		Х	Х	Х	Х	Continuing
Fillmore	Х	Х	Х		Х	Continuing
North Andrew R-VI School District	X	Х	Х		Х	Continuing
Rea		Х	Х		Х	Continuing
Rosendale	Х	Х	Х		Х	Continuing
Rosendale Fire District	Х	Х	Х	Х	Х	Continuing
Savannah	Х	Х	Х		Х	Continuing
Savannah R-III School District	Х	Х	х		Х	Continuing
Northwest Health Services	X	N/A	X		X	N/A

Copies of adoption resolutions are included in Appendix A.

Scope of the Disaster Mitigation Plan

Due to the limited scope of the Stafford Act, federal statute limitations constraining the scope of the plans, parallel efforts being made in the homeland defense arena and funding limitations, SEMA has limited hazard mitigation plans to natural disasters.

Man-made disasters such as weapons of mass destruction, terrorism, industrial accidents and technological hazards are not addressed in this plan, except in the scope of cascading natural disasters that trigger man-made incidents. The potential for a natural disaster to broaden into a technological hazard is recognized. The planning committee chose not to include man-made disasters in the plan's update but will revisit the option during the next update.

Executive Summary

Andrew County is located in Northwest Missouri. The county has abundant natural resources and thriving communities. The county is susceptible to a number of natural disasters, several of which can occur with little-to-no warning.

Mitigation is the effort to reduce the loss of life and property by lessening the impact of these disasters. This plan outlines the disasters that present threats to the county and steps to mitigate the potential impact.

Section 1 of this plan provides general background data for Andrew County. This includes demographic and population statistics, identification of critical facilities and description of natural resources. Each community and school district is profiled. Understanding "where you are" is a fundamental component of the planning process.

Section 2 identifies and explores the types and likelihood of a hazard occurring in Andrew County. It provides a general overview of each of the identified natural hazards: dam failure, drought, earthquake, flood, heat wave, land subsidence, severe winter weather, thunderstorm, tornado and wildfire. The analysis includes historical occurrences, the likelihood and severity of future events.

Section 3 provides a capability and vulnerability assessment of Andrew County should one of the identified disasters occur. It outlines the county's disaster response capabilities and seeks to identify those areas in which the county may improve in disaster mitigation. A brief assessment of each municipality's readiness regarding hazard mitigation is also included. The

section assesses the vulnerability of the jurisdictions for particular hazards and provides a measurement of potential losses.

Section 4 provides mitigation goals, objectives, and mitigation plans in response to each identified natural disaster. Each disaster has specific problems identified with its respective occurrence, overall goals to reduce a disaster's effect, specific objectives towards achieving those goals and implementation plans for the county to pursue. Action items are identified for each jurisdiction.

The overall goals of this and any mitigation plan are to 1) protect the lives, property and livelihood of all citizens; 2) ensure uninterrupted government and emergency function during a natural hazard event; and 3) manage growth through sustainable principles and practices to limit development in hazard-prone areas. These goals, and the other information contained within this plan, will be reviewed every five years under the coordination of Andrew County.

The Andrew County Mitigation Plan is a multijurisdictional plan that represents local governments, school districts and entities within the county.

Transferability of the Data

Background and statistical data for this plan was collected from a variety of sources, including U.S. Census Bureau, U.S. Geological Society, U.S. Army Corps of Engineers, Missouri Department of Natural Resources, Missouri Department of Conservation, Farm Service Agency, Center for Agricultural, Resources and Environmental Systems at the University of Missouri-Columbia and National Climatic Data Center. The Missouri State Hazard Mitigation Plan was updated in 2011 and provided information regarding many hazards affecting Andrew County.

The research gathered during the production of this plan, the maps generated in its support and the general increase of awareness among citizens are all assets that are transferable to other sectors of community preparedness.

This document, its maps, as well as all other documents and files generated to support this plan, are available in an easily transferable electronic format. However, release of some of this data may be restricted by federal, state or local law.

The appropriate Federal Freedom of Information Act and Missouri Sunshine Law procedures will be followed for all data requests. This data may also appear in future disaster

mitigation, response or recovery plans or in plans for parallel efforts in combating terrorism or technological hazards. Anyone wanting a copy of this report or any data generated in its production should write to either of the following addresses:

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Tom Bliss, Executive Director Mo-Kan Regional Council 224 N. 7th Street St. Joseph, Mo 64501 (816) 233-3144 tom@mo-kan.org

Funding Acknowledgment

The Federal Emergency Management Agency (FEMA) Stafford Act Program, the Missouri State Emergency Management Agency (SEMA), and Mo-Kan Regional Council made this project possible. Andrew County and its citizens provided in-kind matching funds to complete this plan.

Plan Production Staff

The following Mo-Kan Regional Council staff members assembled the Andrew County Hazard Mitigation Plan under the guidance of the Andrew County Planning Committee:

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Section 1: Community Profile

Rich with fertile soils, vegetation and wildlife, Andrew County's natural resources made it attractive for Native Americans and pioneer settlers. Farmers cultivated the land to produce abundant crops and livestock. Today, Andrew County continues to thrive as a rural county, with small towns and growing residential areas that provide housing for many residents who work in nearby communities.

This section profiles Andrew County and its jurisdictions. The planning committee reviewed this section from the original plan which was adopted in 2005 and updated throughout.

Geography

Andrew County is located in northwest Missouri, approximately 45 miles north of Kansas City and 120 miles south of Omaha, Neb. See Figure 1.1. Savannah, the county seat, is located at 39°56'28" North, 94°49'51" West. The county has a total area of 436 square miles, which includes 433 square miles of land surface and 3.7 square miles of water. The Missouri River forms the west-



Source:http://publicrecords.onlinesearch es.com/maps/map-of-Andrew-County-Missouri.php

ern border of the county between Kansas and Missouri. Andrew County is served by Interstate 29; U.S. Highways 71 and 59 are also main routes. Rail, truck, barge and air transportation is readily available.

Climate

The climate of northwest Missouri is continental in nature with cold winters, hot summers and is subject to extreme changes in temperature, humidity, cloudiness and wind speeds. The average growing season is 170 days. The mean annual temperature is 52.2 degrees Fahrenheit, with an average January temperature of 26.2 degrees and an average July temperature of 78.2. The average annual precipitation is 31.22 inches. Of this total, 75 percent usually falls in April through September, the growing season for most crops. Tornadoes and severe thunderstorms strike in the region. These storms are usually local in extent and of short duration. Hail occurs during the warmer parts of the year. The average seasonal snowfall is 20.5 inches. The greatest recorded snow depth was 51.1 inches and occurred during the winter of 1925-1926. In an average year, there are 23 days with at least one inch of snow cover on the ground, but it is unusual for the snow cover to last more than seven consecutive days. Prevailing winds are from the south, and average wind speed is highest in April, at 13 miles per hour.

Physiography

The bedrock of Andrew County is classified as being Quaternary and Pennsylvanian bedrock. Alluvium soil formed in the Missouri River flood plain and consists mainly of a rich mixture of sand, silt and clay. These soils are 100 to 150 feet thick. The rest of the region is underlain with bedrock Figure 1.2

from the Upper Pennsylvanian Age and is characterized by an alternation of thin shale, limestone and sandstones (see Figure 1.2). In some places, the limestone may be up to 300 feet thick, but usual thicknesses are only a few feet.





Source: http://www.dnr.mo.gov/geology/geosrv/Missouri.pdf

Topography and Water Resources

The topography of Andrew County consists of rolling hills, valleys and ample drainage provided by streams and rivers. Ground elevations along the Missouri River range from 800 to 900 feet above sea level. Ground elevations reach approximately 1,100 feet in southern Andrew County. Most land is approximately 900 feet above sea level.

The region's rivers and streams played a significant role in influencing the settlement patterns of Andrew County. The waterways provided not only a source of water, but also a dependable means of transportation. Important streams found in Andrew County include the Platte River, Nodaway River (which helps form the western boundary of the county) and the 102 River. These streams flow through Andrew County and eventually empty into the Missouri River. A number of small lakes provide drinking water and recreational uses. A map of hydrologic features is included in Appendix B.

Well water from the area normally needs softening and treatment for removal of iron. The occurrence of water in glacial deposits is more variable than water from alluvial deposits. Some areas of Andrew County could support deep wells that would produce large quantities of water. In many cases, the bedrock is highly mineralized, making the water unfit for human consumption.

Geology, Soils and Minerals

The region generally consists of five geological groupings or land formations: Douglas, Kansas City, Lansing, Shawnee and Wabanausee Group. The Douglas Group is located in some parts of eastern Andrew County. This formation is commonly represented by a shale slope, which lies below a prominent limestone escarpment. The thickness of the group ranges from 110 to 150 feet.

The Kansas City Group lies between the two strata, and the subgroups are conformable, one upon the other. Rocks of the Kansas City Group are well exposed at many localities in western and northern Missouri and are present throughout Northwest Missouri in the subsurface, ranging from 1 to 50 feet in thickness.

The Shawnee Group is primarily located on Andrew County's western edge. The group is especially characterized by the relative abundance and greater thicknesses of the limestone beds

that are included in it as compared to the underlying Douglas Group and the overlying Wabaunsee Group. The thickness of the group in Missouri ranges from 230 to 250 feet.

The region's mineral resources include limestone, sand, gravel, clay and shale, coal and petroleum. Limestone is the only stone quarried in the region. Gravel is mined primarily from the glacial deposits. Clays and shales constitute most of the bedrock in the region. Andrew County has some coal reserves, but future extraction is not likely because the veins are so deep and thin that existing methods are too costly to be utilized.

Some oil exploration has occurred in the region. The ability to locate oil in the area is highly feasible from a geological standpoint. However, economics and the markets on a global scale have limited exploration efforts. Cost will affect exploration intensity and the development of any reserves of oil or gas that may be found.

History of Andrew County

Andrew County's first residents were members of the Sac, Iowa and Fox Indian tribes. The county was part of the Platte Purchase of 1836, which was relinquished to the state of Missouri by treaty. Andrew County's position between the Missouri River and the original western border of the state made it prime land for settlement. Like most of the land included in the Platte Purchase, Andrew County was well suited to agriculture. See Figure 1.3. Other counties included in the Platte Purchase were Platte, Buchanan, Holt, Nodaway and Atchison.

Joseph Walker was the county's first settler in 1835. He located five miles west of Savannah prior to the Platte

Purchase. A Kentucky native, Walker was living in Clay County, Mo., when he decided to move to Andrew County because of the rich land and abundant choice of game. A wave of settlers from Kentucky and Tennessee moved to the area in 1844 and most chose to settle near timberlands and mill sites.

Andrew County was incorporated on January 29, 1841, and named after the seventh president of the United States, Andrew Jackson.



Figure 1.3



Source: Mo-Kan Regional Council

The county seat was founded in 1841, and at that time was called Union. In June 1841, it was renamed to Savannah out of courtesy for Samuel Crowley, who was a member of the first county court. He was originally from Georgia and had a love for his native city of Savannah. Savannah, Mo., was incorporated as a town by legislative action on March 13, 1848, and incorporated as a third-class city on February 24, 1853. James Wood was the first settler on the present site of Savannah.

In addition to Savannah, towns established in Andrew County were Fillmore, Rochester, Amazonia (formerly Nodaway City), Whitesville, Bolckow, Rosendale, Empire Prairie, Nodaway Station and Elizabethtown.

Railroad Development

Until the late 1840s, most of the region's development was tied to transportation along the Missouri River. However, in 1846, a group of St. Joseph businessmen invested \$2 million in an enterprise known as the Hannibal & St. Joseph Railroad that became an influential factor in state history. With heavy investment from a Boston syndicate, the railroad was completed in February 1859.

After the Civil War, the emergence of railroad lines provided the opportunity for several towns to develop, businesses to grow and the population to increase. By the mid-1880s, a spider web of rail lines crisscrossed northern Missouri, connecting even the smallest community with the eastern and western markets.

The railroad broke the Missouri River's monopoly on transportation and altered the trade patterns of the region. Prior to its construction, products not being freighted west were shipped down the Missouri River to St. Louis, and from there to New Orleans, Chicago and the Northeast. At the outbreak of the Civil War, the Hannibal & St. Joseph Railroad was the only completed railroad across Missouri, making its control by the Union and the Confederates significant. For both armies, this railroad provided a link with the western tier of states and their much-needed military, political and economic support.

From 1860 to 1861, nearby St. Joseph, Mo., was home to the Pony Express mail delivery service. Although the Pony Express was short lived at only 18 months, this enterprise sealed the city's link to the history of America's western expansion.

Civil War and Westward Expansion

Andrew County was a border territory, so tensions ran high during and after the Civil War. Settlers were evenly divided for the causes of the North and South. Both northern and southern fractions set up camps in the area. Battles took place along Hackberry Ridge west of Savannah, and famous men like Joseph Hart and William "Bloody Bill" Anderson rode in the area.

With the onset of the Civil War, growth in the region ceased. The war, however, did seem to be a turning point in the region's economy. Farm production shifted from hemp and tobacco to small grains and livestock. Transportation shifted from steamboats and barges to railroads. Communication was through telegraph rather than by Pony Express.

As westward expansion took place, nearby St. Joseph grew in importance as a merchandise and wholesale shipping center. By the 1880s, meatpacking and grain milling became important industries in the region. In fact, the number of jobs in the manufacturing and food processing industries was greater than those employed in the agricultural sector. Smaller communities located on railroads also continued to prosper.

20th Century

Farming and ranching proved to be the main occupations into the 20th Century. The St. Joseph-Savannah Interurban Line was established in 1911, providing the availability of motorcars. The great growth from 1870 to 1900 tapered off by 1900. However, the area continued to be strong financially, and in wholesale and retail trade until the Great Depression. At that time, an out-migration from the region began that continued throughout the century. Mechanization of agricultural production displaced farm workers.

In recent years, Andrew County has begun to achieve modest population growth. While agriculture continues to be the dominant industry, small businesses are also successful. Housing developments have sprouted in southern Andrew County to provide housing for residents who work in nearby St. Joseph.

The Andrew County Historical Museum on Duncan Drive in Savannah preserves history on the people and places of Andrew County from 1841 to 2001. The Rural Way of Life Exhibit focuses on families, farms, towns, social life, agriculture, businesses, entertainment and industry.

Historic Properties and Archeological Sites

Three sites in Andrew County are listed on the National Register of Historic Places. The Andrew County Courthouse is a Romanesque building built in 1899 at Fourth and Main in Savannah. It continues to house county government operations. The J.F. Roberts octagonal barn

Figure	1.4
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Historic Structures and Places in Andrew County Missouri			
Place	Registered	Location	City
Andrew County Courthouse	9-11-1980	4th St. and Main St.	Savannah
Roberts, J.F., Octagonal Barn	11-18-1999	Jct. MO B and MO 48	Rea
Walnut Park Farm Historic	12-22-1999	Jct. of MO 59 and MO	St. Joseph
District		71	
Source: National Park Service			

was built about 1900 near the junction of Missouri Route B and Missouri Highway 48 near Rea. The Walnut Park Farm Historic District is located near the junction of U.S. Highways 59 and 71 north of St. Joseph.

The Archaeological Survey of Missouri (ASM) was created in the 1930s by Jesse Wrench and Brewton Berry, two professors at the University of Missouri. The purpose of the ASM was to document information about archaeological sites before they were destroyed. Today, the primary purpose continues to be one of documenting archaeological resources.

As of July 21, 2003, the ASM had documented 36,845 sites in Missouri, including 156 archaeological sites in Andrew County. The exact locations cannot be shown in order to protect the individual resources. This category may require special attention in the mitigation planning phase, depending on the locations. Today, the Archaeological Survey of Missouri is no longer conducting file searches or recording sites. The site files are available to qualified researchers who have received approval for their research through the American Archaeology Division director, and those can be accessed by contacting the University of Missouri.

Endangered Species

Andrew County is home to four species that are considered endangered. The flathead chub, lake sturgeon and pallid sturgeon are endangered fish species and the greater prairie chicken is an endangered bird species, as shown in Figure 1.5.

Endangered Species				
Species	Scientific Name	Status		
Flathead Chub	Platygobio gracilis	Endangered		
Greater Prairie Chicken	Tympanuchus cupido	Endangered		
Lake Sturgeon	Acipenser fulvescens	Endangered		
Pallid Sturgeon	Scaphirhynchus albus	Endangered		
Source: Missouri Department of Conservation				

Government

The Andrew County Courthouse is located at 401 Court St., Savannah, Mo., with office hours of 8 a.m. to 4:30 p.m. Monday through Friday. Information is posted online at <u>www.andrewcounty.org.</u> The County Commission meets on Mondays and Thursdays. Elected officials are listed in Figure 1.6.

Andrew County Elected Officials				
Presiding Commissioner	Bob Caldwell	816-324-5716		
Eastern District Commissioner	Ray Furst	816-324-5716		
Western District Commissioner	Darryl Howard	816-324-5716		
County Clerk	Sarah Miller	816-324-3624		
Circuit Clerk/Recorder Of Deeds	Tena Christmas	816-324-3921		
Prosecutor	Steven Stevenson	816-324-3535		
Assessor	Paul Garrison	816-324-3023		
Public Administrator	Janet Rosenauer	816-324-4221		
Sheriff	Bryan Atkins	816-324-4114		
Collector	Phil Rogers	816-324-3914		
Treasurer	Cindy Esely	816-324-3614		
Associate Circuit Judge	Michael J. Ordnung	816-324-4221		
Coroner	Doug Johnson	816-390-3425		
Source: Andrew County Commissioners				

Figure 1.6

Economy:

Employment by Industry

Andrew County's economy is closely linked to nearby St. Joseph, where many residents find employment. The economy of the region is dependent on agriculture and related industries. Principle manufacturing in the region includes grain handling and processing, ethanol and biodiesel production, food processing, cold storage, animal health research, pet food manufacturing, package container manufacturing, metal fabrication and chemical manufacturing.

Health care, education and government are other significant employers, as shown in Figure 1.7 and Figure 1.8.

Figure 1.7

Employment In Andrew County By Sector		
Sector	Number Employed	
Retail trade	771	
Construction	623	
Wholesale trade	185	
Finance, insurance, real estate, and rental and leasing	322	
Accommodation and food service	185	
Other services	553	
Source: Savannah Chamber of Commerce		

Figure 1.8

Top Employers In Andrew County					
	Employer	Product/Service	Number Employed		
1	Savannah R-III School District	Education	312		
2	Laverna Village Nursing Home	Care Facility	137		
3	Andrew County	Government	100		
4	Shady Lawn Care Center	Care Facility	63		
5	Apple Market	Grocery Store	52		
6	United Electric Cooperative	Utility	47		
7	Green Hills	Grocery Store	20		
8	City of Savannah	Government	25		
9	Walton Motors	Car Sales & Service	15		
	Source: Savannah Chamber of Commerce				

Agriculture

Agriculture forms a critical portion of Andrew County's economy. Andrew County farmers produce grains, grasses, livestock, timber and specialty value-added agriculture products. The number of farms in the county has increased since 1990; however, most of these farms are very small. The average farm in 2012 encompassed 240 acres. The county has about 826 farms, marketing an average of almost \$70,000 in agriculture products per year. About three-fourths of these products were crops and one-fourth livestock. See Figure 1.9.

Figure 1.9

Andrew County Agriculture				
	2002	2007	2012	
Number of Farms	847	988	826	
Average Size of Farms	264	241	240	
	acres	acres	acres	
Market Value of Products Sold	\$30.8	\$54.8	\$57.7	
	million	million	million	
Average Per Farm	\$36,407	\$55,422	\$69,830	
Source: USDA www.agcensus.usda.gov				

Natural disasters have a significant impact on agricultural production and the economy. The following agricultural disaster areas have been declared in Andrew County since 2005. The information in Figure 1.10 is provided by the Missouri Department of Agriculture.

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Figure	L	.10

Andrew County Agricultural Disaster Declarations		
Туре	Date	
Drought	Jan. 1, 2005	
Drought	Jan. 1, 2006	
Severe storms, tornadoes, flooding	March 30, 2006	
Severe winter storms	Dec. 6, 2007	
Severe freeze	March 30, 2007	
Severe storms, tornadoes, flooding	May 4, 2007	
Rain, flood damage	May 5, 2007	
Severe storms, flooding	May 5, 2007	
Excessive moisture, flooding	March 1, 2008	
Severe storms, flooding	June 1, 2008	
Drought	July 17, 2012	
Drought	August 9, 2012	
Drought	January 17, 2013	
Severe storms, tornadoes, flooding	July 20, 2015	
Source: http://agriculture.mo.gov/disaster		

Figure 1.11

Income

The 2009-2013 per capita income of Andrew County was \$25,302, as shown in Figure 1.11. The median household income was \$54,336 and 8.2 percent of the population had income below the poverty level.

Per Capita Income				
1990 2000 2009-2013				
Andrew County	\$10,984	\$19,375	\$25,302	
Missouri	\$12,989	\$19,936	\$25,649	
United States	\$19,920	\$21,587	\$28,155	
Source: U.S. Bureau of Census				

Transportation:

Adequate transportation linkages are an essential part of modern living. Residents and businesses depend upon accessible, sound transportation to provide for the movement of traffic and transportation of goods. Andrew County is served by several modes of transportation, which provide the economic lifeline to local companies, citizens and their communities. A map of transportation routes is included in Appendix B.

Roadways

Interstate 29 passes through western Andrew County. Interstate 229 serves downtown St. Joseph and the northern portion of I-229 is located in southern Andrew County. U.S. Highway 59 and U.S. Highway 71 are major north-south corridors, passing near the county seat of Savannah. U.S. Highway 169 travels through the eastern part of the county. Nearly all of the state routes are dual-lanes and for the most part, are adequate to handle the current and projected traffic volumes.

Freight

More than 40 general commodity interstate motor carriers offer service to the region, including nationally known carriers such as Consolidated Freightways, Yellow Freight Systems Inc., Roadway Express, Crouse Cartage Co. and Wichita Southeast Kansas Transit. A number of small companies also provide service to the Kansas City and Omaha regions. Truck traffic through the county has increased with industrial development in nearby Buchanan County, especially with the operation of Triumph Foods, a pork processing facility which receives many hogs from Iowa and Minnesota.

Railroad

Two major railroads and three switching lines serve the region. The two carriers serving the area are Burlington Northern – Santa Fe and the Union Pacific Railroad. Switching yards are located in St. Joseph, Mo., and Atchison, Ks. No rail passenger service is available in the region

with the nearest Amtrak station located in Kansas City. There has been some discussion about opening a rail passenger route connecting the Kansas City-Omaha markets but most studies show that such a route would need heavy public subsidies.

Airports

Rosecrans Airport serves the public as a commercial airport. While technically located in St. Joseph, the airport requires crossing the Missouri River into Kansas. Rosecrans has airfreight service and is home to the 139th Airlift Wing unit of Missouri Air National Guard, which actively uses the airport for training and operations. Air passenger service is provided by Kansas City International (MCI), which is located 37 miles south of St. Joseph. There are two private landing strips within Andrew County.

Public Transportation

Andrew County is served by the OATS, The Organized Alternative Transit System (OATS) is a non-profit corporation offering personalized transportation. OATS is funded by federal, state and county funds. The Jefferson Bus Line operates in St. Joseph connecting it with Kansas City. The area also has taxi services; most are based in St. Joseph.

Waterways and Ports

The St. Joseph Regional Port Authority is located in Buchanan County, which is adjacent to Andrew County. The port handles rail and barge shipments. Barges pass through Andrew County on the Missouri River.

Utility Services:

Water

The City of Savannah built a 2-million-gallon capacity water treatment plant in 2008. The plant gets water from wells in the Missouri River bottom and serves the residents of Savannah. There are four water districts that serve the rest of Andrew County. Andrew County Public Water Supply District #1 serves eastern portions of the county and purchases water from the City of Savannah. Public Water Supply District #2 serves the Cosby area and buys water from Missouri American Water Co., which has a treatment facility in St. Joseph. Public Water Supply District #3 serves the Fillmore area and buys water from the City of Savannah. Public Water Supply District #4 serves the northern portion of the county, including Bolckow and Rea and operates its own pump station. In addition, some residents in eastern Andrew County are served by DeKalb County Public Water District #1.

Electricity and Natural Gas

Electricity is supplied by KCP&L and United Electric Cooperative. Missouri Gas Energy is the only natural gas supplier. Rural areas are serviced by propane gas and suppliers are Ferrellgas and United Cooperatives in Savannah; MFA Oil & Propane and Heet Gas of King City.

Telephone

Telephone service is provided by AT&T and SuddenLink. Major cell phone providers covering the area are AT&T, Sprint, Verizon and T-Mobile.

Public Services:

Wastewater Collection and Treatment

The communities of Savannah, Amazonia, Bolckow, Cosby and Country Club Village are served by municipal sewer district, as shown in Figure 1.12. Other communities and rural residents rely on septic systems.

Andrew County Municipal Sewer Services			
Community Municipal Sewer Availabilit			
Amazonia	Yes		
Bolckow	Yes		
Cosby	Yes		
Country Club Village	Yes		
Fillmore	No		
Rea	No		
Rosendale	No		
Savannah	Yes		

Figure 1.12

Law Enforcement

Andrew County is served by county-wide 911 services. All calls are routed through the sheriff's department, which dispatches police fire and ambulance. All areas of the county are served by law enforcement, although many of the communities utilize part-time help in assisting the Andrew County Sheriff and Missouri State Highway Patrol with problems in their municipalities. The Highway Patrol Troop H has 12 road patrol officers serving Andrew and Buchanan Headquarters in St. Joseph. Additional officers counties from Troop H are available to assist with road patrol in situations such as snowstorms. There are 78 officers stationed in Troop H in northwest Missouri.

The Sheriff's Department and two municipal police forces serve Andrew County. The Sheriff's Department has thirteen full-time Figure 1.13

officers, four reserve officers and twelve vehicles (see Figure 1.13). The department also has six full-time dispatchers. The City of Savannah has twelve officers and ten vehicles for use. Country Club Village employs two officers and has two vehicles for use.

Fire Protection

Andrew County is served by six fire Departments (see Figure 1.14). Most of these are volunteer departments. The City of Savannah employs two firefighters, who work with volunteers in the city and rural fire departments. In the majority of cases, more than one department comes to the aid

Law Enforcement Officers			
	Officers	Vehicles	
Missouri Highway Patrol	12	12	
Andrew County	13	12	
Country Club Village	2	2	
Savannah	12	10	
Source: Andrew County LEPC			

Figure 1.14

Andrew County Fire Fighters				
	Firefighters	Vehicles		
Bolckow FPD	12	3		
Cosby/Helena FPD	32	6		
Fillmore FPD	25	8		
Rosendale FPD	21	5		
Savannah/Savannah	60	21		
Rural Fire				
Source: Andrew County LEPC				

of a fire, depending upon the proximity of the various fire stations to the point of emergency.

Ambulance

The Andrew County Ambulance District covers most of Andrew County. In the eastern, rural areas of the county, a portion is served by the Grand River Ambulance District, which is based in King City, Mo.

Recycling

Andrew County is part of the Missouri Region D Recycling and Waste Management District. Savannah, Country Club Village and North Andrew School District conduct recycling programs. In addition, residents are encouraged to take recyclable materials to the recycling trailer, which visits eight locations in the county every month, as shown in Figure 1.15.

Visit Each Month	First Saturday	Second Saturday
8:00 – 9:00 a.m.	Fillmore	· · · · ·
	Water Plant	
9:00 – 10:00 a.m.		Amazonia
		Lions Hall
9:30 – 10:30 a.m.	Helena	
	Main Street	
11:00 a.m 12:00	Cosby	
p.m.	Main Street	
12:30 - 1:30 p.m.	Avenue City	Bolckow
	Oil & Grocery	Downtown
1:30 - 2:30 p.m.	Country Club	Rosendale
	John Glenn School	Main Street
Source: Region D Recyc	cling and Waste Management	

Figure	1.15

Health Care

The Andrew County Health Department at 106 N. Fifth St., Savannah, provides a number of health services. The department is open during periods of extreme heat to provide air conditioned space and ice water for residents. Services provided directly to residents include immunizations, blood pressure and blood sugar checks, STD testing and counseling. The department also administers the Women, Infants and Children nutrition program. Environmental services are provided by the department, which has a staff of seven. Mosaic Life Care operates an acute care hospital, with an emergency and trauma center and specialty centers for cardiac, cancer and maternity treatment in St. Joseph.

News Media

The *Savannah Reporter* newspaper provides weekly local news coverage. The *St. Joseph News-Press* is a daily newspaper providing local and regional news coverage. The *Kansas City Star* is available by mail circulation only.

KQ2 is an ABC affiliate television station out of St. Joseph providing local news, weather and sports coverage. News-Press3Now (Fox affiliate) is a local cable television news station that is affiliated with the *St. Joseph News-Press*. Cable service is provided from St. Joseph SuddenLink, and it is available in all cities over 1,000 in population.

Available radio stations include five stations based in St. Joseph: KFEQ 680 AM news and talk, KESJ 1550 AM sports, KSJQ 92.7 FM, country music, KKJO 105.5 FM contemporary music; KGNM 1270 AM and 102.5 FM Christian talk and music. KAAN in Bethany: 95.5 FM/870 AM is also received in the county.

Housing

The availability of affordable, adequate housing is a primary determinant of a region's ability to attract new residents and stimulate economic growth. Andrew County has a variety of housing choices, from multifamily, entry-level single family, upscale communities, and a wide variety of housing choices for seniors and the medically disabled. The wide variety of housing types available in Andrew County generally meets all levels of need for individuals and families alike. According to the US Census, 76.7 percent of the homes in Andrew County are owner-occupied and 23.3 percent of county residents live in renter-occupied units. Figure 1.16 shows the housing numbers and average price of a single family home. Figure 1.17 shows the age of owner-occupied homes in Andrew County.

Figure 1.17

Housing Numbers				
And Average Costs				
Housing Average				
	Units	Price		
Amazonia	141	\$54,600		
Bolckow	112	\$60,000		
Cosby	70	\$53,300		
Country Club	1125	\$164,800		
Village				
Fillmore	104	\$53,800		
Rea	18	\$56,700		
Rosendale	70	\$22,100		
Savannah	2,197	\$99,800		
Source: US Census, 2010				

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Age of Owner- Occupied Housing	Number	Percent
Built 2010 or later	54	.07
Built 2000 to 2009	936	12.8
Built 1990 to 1999	972	13.3
Built 1980 to 1989	903	12.4
Built 1970 to 1979	1,343	18.4
Built 1960 to 1969	661	9.1
Built 1950 to 1959	603	8.3
Built 1940 to 1949	344	4.7
Built 1939 or earlier	1,480	20.3
Source: U.S. Census, 2010		

Land Use:

Of the 436 square miles comprising Andrew County, 310 square miles (71 percent) are in agricultural production, leaving 126 square miles (29 percent) not in agricultural production. **Commercial**

Andrew County's seat, the City of Savannah, is the trade center for the county. The majority of Savannah's commercial development is in the southern half of the community along Business Route U.S. 71. Additionally, the city has undertaken a successful downtown revitalization process and was named a DREAM "Downtown Revitalization and Economic Assistance for Missouri" community.

However, the region's major commercial center is located in St. Joseph. The Shoppes at North Village are a modern lifestyle shopping center located just south of Andrew County on U.S. Highway 169, also known as the Belt Highway. The center is easily accessible for Andrew County residents and contains four anchor stores, a movie theater, numerous restaurants and specialty stores. The adjacent North Pointe Shopping Center contains restaurants and health clinics, with space available for retail stores.

Residential

Residential development in the area consists primarily of single-family homes with most concentrated in communities that have water and sewer services. In general, this means that incorporated communities are also where the single-family residential units are located. Andrew
County has experienced some subdivision and scattered rural non-farm housing development around the communities of Amazonia, Country Club and Savannah. There has been some residential growth along U.S. Business Route 71.

Other land uses

Another major land use in Andrew County is recreational areas. Many of the region's communities have public squares and local parks. Outside of the municipal residential areas, there are several recreational areas.

- 1. Savannah City Reservoir
- 2. Happy Holler Lake
- 3. Bob's Fishing Lake
- 4. Worthwine Island Conservation Area
- 5. Rochester Falls Conservation Area
- 6. Honey Creek Conservation Area

A number of lakes provide drinking water, land conversation and recreational opportunities.

Demographics

According to the 2010-2014 American Community Survey by the US Census, there are 17,379 people, 6,710 households and 4,689 families residing in Andrew County. The population density is 40 people per square mile. There are 7,296 housing units at an average density of 15 houses per square mile. The racial makeup of the county is 97 percent white, 0.8 percent black or African-American, 0.3 percent Native American, 0.5 percent Asian, less than 0.1 percent Pacific Islander, 0.2 percent from other races, and 0.5 percent from two or more races. Hispanics or Latinos of any race make up 2.2 percent of the population.

Of the 6,710 households, out of which 27.7 percent have children under the age of 18 living in them, 60.2 percent are married couples living together, 6.1 percent have a female householder with no husband present, and 30.1 percent are non-families. Individuals make up 24.5 percent of all households and 11.3 percent have someone living alone who is 65 years of age or older. The average household size is 2.55 persons and the average family size is 3.03.

In the county, the population is distributed in a typical bell-curve with 23.5 percent under the age of 18, 7.9 percent aged 18 to 24, 22.8 percent aged 25 to 44, 29.32 percent from 45 to 64,

and 16.5 percent who are 65 years of age or older. The median age is 42 years. The median income for a household in the county is \$53,986, and the median income for a family is \$67,320. The per capita income for the county is \$25,302. Regarding income, 9.3 percent of the population and 7.8 percent of families are below the poverty line.

General Population Patterns

The population of Andrew County increased during the last decade, according to an estimate from the U.S. Census Bureau. The county has seen small but consistent growth, unlike many rural counties experiencing out-migration. The larger communities in Andrew County, Savannah and Country Club Village, are experiencing growth, while the smaller communities struggle to maintain their population. Figure 1.18 shows the population changes in Andrew County and its incorporated cities.

Population of Cities in Andrew County						
	1980	1990	2000	2010	2014 Estimate	Change from 2010-2014
Andrew County	13,980	14,632	16,492	17,291	17,379	+373
Amazonia	314	257	277	257	308	+51
Bolckow	245	253	234	187	189	+2
Cosby	148	121	143	124	125	+1
Country Club Village	1,234	1,746	1,846	2,449	2,475	+26
Fillmore	265	256	211	184	186	+2
Rea	78	62	56	50	50	0
Rosendale	223	186	180	143	144	+1
Savannah Source: U.S. Census	4,184	4,401	4,762	5,057	5,129	+72

Figure 1.18

Population Changes

Figure 1.19 shows that Andrew County has grown by 5.1 percent since 2000, while nearby St. Joseph has grown by 3.9 percent during the same time. Andrew County has experienced slower growth than the Missouri's growth rate.

Population Changes in Andrew County				
	County	Missouri		
Population, 2014 estimate	17,379	6,063,589		
Population, percent change 2010 to current estimate	0.05	1.2		
Population, 2010	17,291	5,988,923		
Population, percent change, 2000 to 2010 4.6 6.6				
Source: US Census				

Jurisdiction Profiles:

Amazonia

Amazonia is located in southwest Andrew County and was founded in 1857. The estimated population in 2014 was 308 and a total land area of 0.37 square miles. Critical structures include Amazonia Elementary School, U.S. Post Office, Savannah Rural Fire Station, Lions Hall and Veterans of Foreign Wars Hall. See Figure 1.20.

Figure 1.20

Total Population	308
Leadership structure	Mayor / Council
Classification	Fourth Class
Median household income	\$31,875
Total housing units	141
Water service	Andrew County PWSD #3
Electric service	KCP&L
Sewer	Amazonia
Law enforcement	Andrew County Sheriff
Fire service	Savannah Rural Fire
Ambulance service	Andrew County Ambulance
Source: US Census, 2010	·

Bolckow

Bolckow is located in north central Andrew County on Missouri Route B. The town was founded in 1868. The 2014 estimated population was 189 and a total land area of 0.3 square

miles. Critical structures are the city water treatment plant, U.S. Post Office, Bolckow Fire Station and telephone building. The city also has a church located in the former school building. See Figure 1.21.

Total Population	189
Leadership structure	Mayor / Council
Classification	Village
Median household income	\$37,250
Total housing units	112
Water service	Andrew County
	PWSD #4
Electric service	KCP&L
Sewer	Amazonia
Law enforcement	Andrew County
	Sheriff
Fire service	Bolckow Fire
	Protection
Source: US Census, 2010	1

Figure 1.21

Cosby

Cosby is a village located in southeast Andrew County on Missouri Route O. It was founded in 1882. It had an estimated population in 2014 of 125 and a land area of 0.1 square miles. Critical structures include the U.S. Post Office, two Public Water Supply District #2 buildings, sewer treatment facility, Lions Hall and Eastern Star Hall, Cosby/Helena Fire Station, telephone company building, Best Seat in the House business and a former bank building owned by Cosby. See Figure 1.22.

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Total Population	125
Leadership structure	Town Council
Classification	Village

Median household income	\$51,250
Total housing units	70
Water service	Andrew County PWSD #2
Electric service	KCP&L
Sewer	Cosby
Law enforcement	Andrew County Sheriff
Fire service	Helena/Cosby Fire Protection
Source: US Census, 2010	

Country Club

Country Club is a village located in south central Andrew County on U.S. Highway 59 adjacent to St. Joseph, Mo. The village had a total population of 1,846 in 2000, which has grown to an estimated 2,475 in 2014, and covers a total area of 3.94 square miles, which has increased from the last plan due to annexation. Country Club has a city hall, John Glenn Elementary School, Savannah District Fire Station, the St. Joseph Country Club and several small businesses. See Figure 1.23.

Total Population	2,475
Leadership structure	Chairman & Board of Trustees
Classification	Village
Median household income	\$66,680
Total housing units	1,125
Water service	Missouri American Water
Electric service	KCP&L
Sewer	St. Joseph
Law enforcement	Country Club Village
Fire service	Savannah Rural Fire
Source: US Census, 2010	

Figure 1.23

Fillmore

Fillmore is a city located in western Andrew County on Routes A and H. The city had an estimated population of 186 in 2014 and a total land area of 0.1 square miles. Critical structures are the U.S. Post Office, Fillmore Fire Station, Masonic Lodge and Country Music Opry Hall. See Figure 1.24.

Figure	1	.2	4

Total Population	186
Leadership structure	Mayor / Council
Classification	Fourth Class
Median household income	\$41,875
Total housing units	104
Water service	Andrew County PWSD #3
Electric service	KCP&L
Sewer	Amazonia
Law enforcement	Andrew County Sheriff
Fire service	Fillmore Fire Protection
Source: US Census, 2010	

Rea

Rea is a located in northern Andrew County on Missouri Highway 48. In 2014 the city had an estimated population of 50 and a total land area of 0.1 square miles. Rea was founded in 1877. See Figure 1.25.

Figure	1	.25
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Total Population	50
Leadership structure	Town Council
Classification	Village
Median household income	\$36,875
Total housing units	18
Water service	Andrew County PWSD #4

Electric service	KCP&L
Sewer	Amazonia
Law enforcement	Andrew County Sheriff
Fire service	Rosendale Fire Protection
Source: US Census, 2010	

Rosendale

Rosendale was founded in 1869 and is located on Missouri Highway 48 in northern Andrew County. The city's estimated population in 2014 was 144 people and the area was 0.3 square miles. The city is entirely located in the floodplain of the 102 River and susceptible to flooding. It is also a concern that the access roads flood on Missouri Highway 48 to the east and west of Rosendale and State Route C to the south. Critical structures are the Lions Hall and Trimmers Grocery. The U.S. Post Office and North Andrew School have relocated outside of city limits and out of the floodplain. See Figure 1.26.

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Total Population	144
Leadership structure	Mayor / Council
Classification	Fourth Class
Median household income	\$37,500
Total housing units	70
Water service	Andrew County PWSD #4
Electric service	KCP&L
Sewer	Amazonia
Law enforcement	Andrew County Sheriff
Fire service	Rosendale Fire Protection
Source: US Census, 2010	

Savannah

Savannah is the seat of Andrew County and is located near the geographic center of the county. U.S. Highway 59 is the main highway through the city. Savannah was founded in 1841. The city had a population of 4,762 in the 2000 census. The population was estimated to have grown to 5,129 in 2014. The city has an area of 3.25 square miles.

Critical infrastructure in Savannah includes:

- Andrew County Courthouse, which is the center of the downtown square
- Savannah City Hall is on the south side of the square
- Savannah High School, Middle School and Minnie Cline Elementary School •
- Fire station •
- County jail
- Health department •
- Senior center
- Many of the county's businesses are located in Savannah
- Two nursing homes •
- Five child care facilities •

Figure 1.27 shows additional information about Savannah and Figure 1.28 provides information about Savannah's vulnerable populations.

8	

Figure 1.27

Total Population	5,129
Leadership structure	Council/Administrator
Classification	Fourth Class
Median household income	\$38,914
Total housing units	2,197
Water service	Savannah
Electric service	KCP&L
Sewer	Savannah

Law enforcement	Savannah Police
Fire service	Savannah Fire
Source: US Census, 2010	

Figure 1.28

Vulnerable Populations		
Child Care Facilities		
Facility	Address	
Community Action Partnership	304 N. 4 th St.	
Cornerstone Christian Child Care	16100 Highway 71	
Country Kids Learning Center	12895 State Route E	
Little Tots School House	12521 State Route RA	
Maple Tree Preschool	302 N. Third St.	
Long Term Care Facilities		
Facility	Address	
La Verna Village Nursing Home	904 Hall Ave.	
Shady Lawn Nursing Home	13277 State Route D	
Source: Missouri Department of Health and Senior Services		

School Profiles:

Avenue City School

The Avenue City School District has an elementary school with kindergarten through eighth grades located on U.S. Highway 169 near the unincorporated area of Avenue City. The enrollment is 191 students with 21 staff members. The estimated population at special events is 150 people.

Avenue City has an emergency operation plan and performs tornado and fire drills twice per year, with input from local emergency management officials. A safe room in case of tornado and high wind event was constructed as part of the bond issue in 2008. The district notifies parents and the public when school is canceled due to severe winter weather using text and voice messaging services. The school is completely air conditioned. See Figure 1.29.

Avenue City School District Facilities				
Facility	Square	Replacement	Contents	Occupancy
	Footage	Value	Value	

Source: Missouri United School Insurance Council

North Andrew R-VI School

North Andrew R-VI has a total enrollment of 368 students with 55 staff members. The schools are located at one facility near Rosendale. The high school has 116 students, the middle school has 90 students and the elementary has 162 students. The estimated attendance at special events is 800 people.

North Andrew has an emergency operations plan, performs tornado and fire drills and has an official policy for severe winter weather. The buildings are all air conditioned. A safe place is available for students and faculty to go to in the event of a tornado or high winds. See Figure 1.30.

T .	1	30
Figure		.30
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North Andrew School District Facilities				
Facility	Square Footage	Replacement Value	Contents Value	
Main School (K-12)	72,185	\$12,060,588	\$1,631,460	
Bus Barn/Maintenance Building	3,100	\$349,617	\$10,844	
Concession Stand	800	\$47,026	\$4,066	
Announcers Stand	288	\$11,266	\$1,354	
Storage Shed	288	\$4,658.	\$1,354	
Picnic Shelter	800	\$4,956	\$0	

Greenhouse #1	924	\$36,711	\$8,132
Greenhouse #2	648	\$29,833	\$6,777
Football Field Lights	0	\$0	\$21,801
Softball Field Lights	0	\$0	\$11,528

Source: Missouri United School Insurance Council

Savannah R-III School

The Savannah R-III School District has a total enrollment of 2,353 students and approximately 300 staff. The high school is located in Savannah and has 774 students. The middle school has 547 students and is located in Savannah. The district has four elementary schools with total enrollment of 1,032 students. The schools are located in Amazonia, Helena, Country Club and Savannah.

Savannah School District Facilities				
Facility	Square Footage	Replacement Value	Contents Value	Capacity
Savannah Middle School	81,530	\$12,953,122	\$686,999	615
Minnie Cline Elementary	67,910	\$10,995,055	\$1,245,877	664
Helena Elementary	19,186	\$2,983,158	\$403,994	114
Amazonia Elementary	18,426	\$2,887,939	\$376,882	153
John Glenn Elementary	30,283	\$4,752,125	\$600,569	279
Savannah High	120,583	\$1,300,000	\$1,399,072	803
PAT Building	3,544	\$589,938	\$91,000	3
Wrestling Weight Room	13,500	\$1,723,684	\$496,000	
Old Middle School Gym	10,500	\$1,408,200	\$9,000	
Maintenance Building	3,000	\$244,804	\$63,716	3
Savannah High Concession	330	\$313,950	\$27,114	

Figure 1.31

Storage Building	400	\$8,945	\$16,266	
Central Office	13,640	\$1,274,841	\$227,470	22
Building Trades House	2,024	\$201,400	\$20,400	
Storage Sheds		\$10,000	\$10,000	

Source: Missouri United School Insurance Council

Neighboring communities of influence:

St. Joseph, Missouri

St. Joseph is located at 39°45'29" North, 94°50'12" West. According to the U.S. Census Bureau, the city has a total area of 44.5 square miles. St. Joseph is the eighth largest city in Missouri and the county seat of Buchanan County. The city is also the industrial and retail hub for the region. Many residents of Andrew County work in St. Joseph and frequently visit the city for shopping, entertainment and to attend places of worship.

Kansas City Metro Area

The Kansas City Metropolitan Statistical Area totals 2,071,133 in population, and ranks as the 37th largest city in the United States, according to the 2010 US Census. Kansas City, Ks and Kansas City, Mo., are cities of approximately 147,335 and 459,787 people respectively. The entire Kansas City Metropolitan Area is located across Cass, Clay, Clinton, Jackson, Lafayette, Platte and Ray counties in Missouri, and Johnson, Leavenworth, Miami and Wyandotte counties in Kansas. Kansas City is easily accessed by Interstate 29 and US Highway 71, which passes through Andrew County and residents visit the city for shopping, entertainment and business.

Section 2: Hazard Identification

Identifying hazards which can affect the planning area is a central element of hazard mitigation planning. This section has been included in past plans. Updates have been made throughout this section, including updating events that have occurred, more information about the hazard and improving areas where data was not available in the previous plans.

The planning committee analyzed the potential natural hazards and determined that due to the location Andrew County was not at risk for certain natural hazards. Hazards not included in the plan are; tsunamis, volcanoes, avalanches, hurricanes, coastal storms, coastal erosion, expansive soils and landslides. Hazards which are included in the mitigation plan are; dam failure, drought, earthquakes, floods and levee failure, heat waves, land subsidence, severe winter weather, thunderstorms, tornados and wildfires. See Figure 2.1.

Figure	2.	1
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Hazard Identification				
	Hazards included in plan			
Dam failure				
Drought				
Earthquake				
Flood and Levee Failure				
Heat Wave				
Land Subsidence/Sinkhole	es			
Severe Winter Weather				
Thunderstorm/High Wind	/Lightning/Hail			
Tornado				
Wildfire				
Hazards not included	Reason for dismissal			
Tsunamis	Missouri is located deep within the continent			
Avalanche	Missouri does not have large mountains with significant snowfall			
Volcano	Missouri is not located near identified volcanic activity			
Hurricanes	Missouri is located far from large bodies of warm water			
Coastal storms	Missouri is located deep within the continent			
Coastal Erosion	Missouri does not have coastlines			
Expansive Soils	Missouri's soil does not contain expansive clays			
Landslide	Missouri does not have mountains or soils identified with landslide			

The committee then evaluated each of the other hazards and assessed the potential magnitude, frequency of occurrence, seasonal pattern, areas likely to be affected, probable duration and potential speed of onset

Several resources were investigated for the accumulated data relating to natural hazards. These include the Federal Emergency Management Agency (FEMA), the Missouri State Emergency Management Agency (SEMA), National Climatic Data Center (NCDC) and National Oceanic and Atmospheric Administration (NOAA) websites and databases. United States Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) were the primary sources for earthquake information. Other sources included county officials, existing county, regional and state plans, reports on the floods of 1993,1995 and 2011, levy district data, and information from local officials and residents.

Format for the Description of Each Hazard:

Description of Hazard

This section describes the type of hazard expected, possible pathways or areas likely to be affected and the type of damage that could be expected.

Historic Occurrences

This section describes the frequency, strength, number of lives lost, number of injuries and economic losses encountered in past incidents with this type of hazard.

Location

The geographic area of the county that each hazard could be expected to impact.

Probable Severity

This section ranks a disaster's potential to harm Andrew County in future events as critical, limited or negligible. Each level was assigned a coordinating number of measurement to assess vulnerability. These levels are defined as:

Critical: Death. Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for several days. More than 25 percent of property is damaged. **High**

Limited: Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one day. More than 10 percent and less than 25 percent of property is damaged. **Medium**

Negligible: Injuries and/or illnesses are treatable with first aid. Minimal quality-of-life impact. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property is damaged. **Low**

Cascading Disasters

Disasters often precipitate additional disasters. For instance, a mild earthquake that does little damage may cause an already structurally unsound earthen dam to collapse. The dam's collapse could release water into a drainage channel and kill or injure people downstream. Another example might be a wildfire that is ignited by a downed electrical line following a tornado or windstorm. Or, during a drought, windblown dust reduces visibility on a highway, causing a multi-car collision. Many different scenarios can be produced as a result of these base disasters cascading into other potential incidents of destruction. The more likely cascading relationships are outlined in Figure 2.2.

riguie 2.2

Cascading Hazards Resulting from Natural Disasters								
	Power and Communications	Water Supply	Business	Civil Unrest	Computer Failure	Transportation	Health and Environment	Government
Tornado	Х	Х	Х	Х	Х	Х	х	Х
Severe Thunderstorm/ High Wind/ Lightning/Hail	x	х	X		х	X		X
Flood	Х	Х	Х	Х	Х	Х	х	
Severe Winter Weather	Х	Х	Х		Х	Х	X	Х
Drought		Х	Х	Х			Х	
Heat Wave		Х		Х		Х	х	
Earthquake	Х	Х	Х	Х	Х	Х	X	Х
Dam Failure	Х	Х					х	
Wildfire							X	
Landslide		X				X	X	

Probable Risk

This section will state a disaster's potential to occur in Andrew County based upon historic records and other available information. Each disaster will show a percentage, reflecting the likelihood of occurrence

Next Disaster's Likely Adverse Impact on the Community

Based upon the preceding factors, this section ranks the next disaster's likely impact. When considering the next disaster's impact, its probability of reoccurrence, likely magnitude and how the community has addressed available mitigation options are considered. This is the most qualitative ranking. Pre- and post-disaster mitigation planning efforts are considered.

Dam Failure

A dam is defined by the National Dam Safety Act as an artificial barrier which impounds or diverts water and (1) is at least six feet high and stores at least 50 acre-feet of water; (2) is at least 25 feet high and stores at least 15 acre-feet of water; and (3) unless the barrier, because of the location or another physical characteristic of the barrier, is likely to pose a significant threat to human life or property if the barrier fails.

See Figure 2.3. Congress first authorized the U.S. Army Corps of Engineers to inventory dams in the United States with the National Dam Inspection Act of 1972. The National Inventory of Dams (NID) was first published in 1975, with updates as resources permitted over the next ten years. The Corps also began close collaboration with the Federal Emergency Management Agency (FEMA) and state regulatory offices to obtain more accurate and complete information.

The NID consists of dams meeting at least one of the following criteria:

• High hazard classification: Loss of one human life is likely if the dam fails,

• Significant hazard classification: Possible loss of human life and likely significant property or environmental destruction,

• Equals or exceeds 25-feet in height and exceeds 15 acre-feet in storage.



Source: NID, 2015

• Equals or exceeds 50 acre-feet in storage and exceeds 6-ft in height.

Of the 79,000-plus dams in the United States, less than five percent are under the control of the federal government. Missouri's Department of Natural Resources (DNR) regulates the design, construction and maintenance of 5,244 nonfederal, non-agricultural dams that are at least 35 feet high. Of these, 656 are routinely monitored by state officials. Dam owners have primary responsibility for the safe design, operation and maintenance of their dams. Owners are also



responsible for providing early warning of problems at the dam, for developing an effective emergency action plan, and for coordinating that plan with local officials.

Missouri's DNR Water Resources Center maintains a Dam and Reservoir Safety Program. The objective is to ensure that dams are safely constructed, operated and maintained pursuant to Chapter 236 Revised Statutes of Missouri. Under that law, a dam must be 35 feet or higher to be state regulated. These dams are surveyed by state inspectors at least every five years. However, most Missouri dams are less than 35 feet high and therefore are not regulated. While the state has, for many years, encouraged dam owners to inspect those unregulated dams; however, local inspections may not be consistent, capable and/or the condition of some of the smaller structures may be inadequate.

Oversight is extremely valuable to the owners as well as those people living downstream of the dam who could be flooded in the event the infrastructure should fail. Dams can fail for many reasons. The most common are:

• *Piping Failure*: internal erosion caused by embankment leakage, foundation leakage and deterioration of pertinent structures appended to the dam.

• *Erosion*: inadequate spillway capacity causing overtopping of the dam, flow erosion and inadequate slope protection.

• Structure Failure: caused by an earthquake, slope instability or faulty construction.

These failure types often are interrelated. For example, erosion, either on the surface or internal, may weaken the dam or lead to structural failure. In addition, a structural failure may shorten the seepage path and lead to a piping failure.

Historic Occurrences

Thousands of people have been injured, many killed, and billions of dollars in property damaged by dam failures in the United States. The problem of unsafe dams in Missouri was dramatically underscored by the December 2005 collapse of the upper reservoir of Ameren UE's Taum Sauk hydroelectric complex in Reynolds County. The result of the 5 million-ton torrent swept away a sleeping state park superintendent and seriously injured his family members. Overall, many of Missouri's smaller dams are becoming a greater hazard as they continue to age

and deteriorate.

There have been 26 recorded dam failures in Missouri over the last 100 years. One drowning is recorded among all of these disasters. There are no known instances of dam failure in Andrew County that resulted in injury, a loss of life or imposed a considerable cost. Dam failures are typically related to, and can cascade from, other natural events. Flash floods, earthquakes and landslides can cause a dam failure, or accelerate the failure of an already weakened structure. Dam failures can result in the loss of crops, livestock, structures, homes, life and property. Many communities use dams for the storage of drinking water, recreation and natural habitat and the loss of a dam could have a significant effect upon a community.

NID has defined three levels of hazard potential – high, significant and low - as accepted by the Interagency Committee on Dam Safety.

DNR classifies hazard classes range from one to three. The lower the hazard class number the higher the risk. The definitions are:

- Class I: The area downstream from the dam that would be affected by inundation contains ten (10) or more permanent dwellings or any public building. Inspection of these dams must occur every two years.
- Class II: The area downstream from the dam that would be affected by inundation contains one to nine permanent dwellings, or one (1) or more campgrounds with permanent water, sewer and electrical services or one (1) or more industrial buildings. Inspection of these dams must occur once every three years.
- Class III: The area downstream from the dam that would be affected by inundation does not contain any of the structures identified for Class I or Class II dams. Inspection of these dams must occur once every five years.

Location

According to the Missouri DNR, Andrew County has 28 dams, only one of which is regulated by the department. The average dam height is 27.07 feet and has a cumulative drainage area of 10,708 acres. They are owned by local governments, water districts, homeowners associations or private individuals. Most of the dams are earthen structures. No

dams in Andrew County are used for power generation. Three dams in Andrew County are considered Class I by DNR: Savannah City Reservoir Dam, Happy Holler Dam and Keller Lake Dam. These are identified in Figure 2.4.



Source: Mo-Kan, 2016

The map in Figure 2.5 identifies the eight dams that are classified as high hazard potential and the one classified as significant in the NID for Andrew County. Individual potential inundation boundary maps are located in Appendix B. Additional information regarding the NID dams in



Figure 2.5

Figure 2.4

Source: Mo-Kan, 2016

Andrew County is provided below in Figure 2.6

National Inventory of Dams for Andrew County

Figure 2.6

	1	1	1			1	r	r
Dam Name	QIQIN	Hazard Potential *	NID Height (Ft.)	River	Nearest City *	Distance To City (Mi.) *	County	Enforcement Authority
SCHWEIZER LAKE	1011051				OT LOGENI			
DAM	MO11251	High	25	MILL CREEK	ST JOSEPH	15	ANDREW	N
KELLER LAKE DAM	MO11608	High	25	CREEK	ST JOSEPH	_	ANDREW	N
LAKELAND		ingn	20	CIULLI	51. FOSEI II			1,
ESTATES LAKE								
DAM	MO10499	High	25	TR-102 RIVER	ST JOSEPH	-	ANDREW	N
THOMPSON LAKE	MO10720	TT' 1	20	TR-CAPLES		~		NT
DAM	MO10/20	High	30	CREEK	AMAZONIA	5	ANDREW	N
DYSART LAKE DAM	MO11065	High	25	CREEK	ST IOSEPH	_	ANDREW	N
LAKE LA VERNE	MOTIOU	ingn	20	TR-PLATTE	51 JOSEF II			1
DAM	MO10086	High	30	RIVER	CAWOOD	1	ANDREW	Ν
SAVANNAH CITY	MO10038	High	34	MACE CREEK	AMAZONIA	5	ANDREW	N
RESERVOIR DAM								
HAPPY HOLLER			10					
DAM	MO12380	High	43	PLATTE RIVER	WHITESVILLE	-	ANDREW	Y
CULVED LAVE DAM	MO11026	Low	25	TR-THIRD FORK	UNION STAD		ANDDEW	N
CULVEK LAKE DANI	M011020	LOW	23	TR DILLON	UNION STAK	-	ANDKEW	IN
MONONAME 278	MO10784	Low	20	CREEK	AVENUE CITY	_	ANDREW	N
		Low	20	TR-LINCOLN				11
COLE LAKE DAM	MO11722	Low	25	CREEK	ST JOSEPH	-	ANDREW	Ν
PETERSON LAKE				TR-THIRD FK				
DAM	MO11810	Low	26	PLATTE RIVER	AGENCY	27	ANDREW	N
ANDREW COUNTY	1.0010000	Ŧ			OT LOOFDU	10		
LAKE DAM	MO10083	Low	25	DILLON CREEK	ST JOSEPH	10	ANDREW	N
FORD LAKE DAM	MO10558	Low	23	MACE CREEK	AMAZONIA	4	ANDREW	N
PARADISE LAKE	MO10041	Low	20	TR MACE CREEK	AMAZONIA	-	ANDREW	Ν
KELLEY LAKE DAM	MO10487	Low	26	TR-ONE HUNDRED AND TWO RIVER	ROCHESTER	-	ANDREW	N
SYBERT LAKE DAM-				TR-HUNDRED				
UPPER	MO12090	Low	25	AND TWO RIVER	ROSENDALE	-	ANDREW	N
ROACH SITE 005	MO12271	Low	26	HICKORY CREEK	WHITESVILLE	7	ANDREW	N
SCHWEIZER SITE 003	MO12270	Low	29	NODAWAY	NODAWAY	3	ANDREW	N
SYBERT LAKE DAM- LOWER	MO12094	Low	26	TR-HUNDRED AND TWO RIVER	ROSENDALE	-	ANDREW	N
CONNIE FIELD	MO50835	Low	37	102 RIVER	NONE	-	ANDREW	Ν

Dam Name	NIDID	Hazard Potential *	NID Height (Ft.)	River	Nearest City *	Distance To City (Mi.) *	County	Enforcement Authority
SCHWEIZER 004	MO50004	Low	27	NODAWAY	NODAWAY	3	ANDREW	Ν
				TR-CROOKED				
BASHOR DAM NO. 1	MO50135	Low	27	CREEK	ROCHESTER	13	ANDREW	N
CLINT MESSNER	MO50834	Low	33	MACE CREEK	NONE	-	ANDREW	Ν
JEFF & CARYL				TR-LONG				
LANCE DAM #1	MO50136	Low	26	BRANCH CREEK	AVENUE CITY	6	ANDREW	Ν
				TR-KELLOG				
LANCE NO 1	MO50000	Low	29	BRANCH	AVENUE CITY	18	ANDREW	N
LANDESS DAM SITE		Signif						
002	MO12272	icant	28	LINCOLN CREEK	NODAWAY	13	ANDREW	N

Source: National Inventory of Dams

The Savannah City Reservoir is located northwest of the city of Savannah in a rural area. The reservoir is a recreational area enjoyed by many residents. A few homes are located in the area around the reservoir. It is also located near U.S. Highway 71. The reservoir is a back-up water supply for the city of Savannah.

Happy Holler Dam is the only regulated dam. Happy Holler Lake Conservation Area includes a 622-acre conservation area. The park also includes camping sites, but there are no amenities. There are no homes or facilities in the area. Keller Lake Dam is a private dam located in an area north of the intersection of U.S. Highway 59 and Interstate 29. There are homes and businesses near the lake.

Coordination with FEMA Risk MAP Project

Risk Mapping, Assessment and Planning (Risk MAP) is the FEMA Program that provides communities with flood information and tools they can use to enhance their mitigation plans and take action to better protect their citizens. Through collaboration with state, tribal and local entities, Risk MAP delivers quality data that increases public awareness and leads to action that reduces risk to life and property. This data is not yet available to Andrew County.

As mentioned above, Andrew County does not currently have a Risk MAP watershed project. However, it does have an effective FIS/DFIRM (available from the Map Service Center). Once completed, Risk MAP will provide mitigation planning support in a variety of ways including helping in the assessment of risks and identifying action items to reduce vulnerability. In addition, this project will provide tools to improve the understanding of risk by local officials and the general public. Figure 2.7, Missouri Study Map 7-6-2015, illustrates the current status of Missouri counties in regard to Risk Map projects, including Andrew County.



Source: FEMA

Probable Severity

Due to location and size, dam failure would have a critical impact on the area immediately below the dam. Because the Savannah City Reservoir serves as a contingent water supply, dam failure could have a more significant impact.

Probable Risk

Dam failure is unlikely to happen in Andrew County. There is no record of a dam failure within the county. For the 26-year period from 1975 to 2001 for which dam failure statistics are

available, 17 dam failures were recorded. According to this data, the annual probability calculates to a 65% (17/26 = 0.65 or 65%) probability in any given year for at least one dam failure event somewhere in the State of Missouri. However, with over 5,000 dams in the State, this translates to an overall low probability per dam structure.

Adverse Impact

If a dam with a high hazard level, as determined by DNR, would fail, it would have a critical impact on the area immediately below the dam. Because the Savannah City Reservoir is a backup water supply, it could have a more significant impact. If a dam with a significant or low hazard level would fail, the impact would be negligible.

Drought

Drought is a natural hazard that is usually first experienced by farmers and the agriculture sector but its lingering presence can impact communities, economies, food and water supplies and the natural environment on national levels. The National Climatic Data Center (NCDC) estimates drought costs the U.S. economy about \$7 billion to \$9 billion per year. However,





particular years can be more damaging. Examples within the past thirty years include 1980, 1988, 2011 and 2012. NCDC reported losses from these events as four of the costliest droughts affecting the United States since 1980 (see Figure 2.8). These examples were prolonged and stretched across much of the United States; as a result damages led to massive outlays in crop insurance payouts, grocery price inflation and communities rationing water. Please see the attached chart identifying the costs adjusted for 2012 dollars. Andrew

County farmers and communities were among those affected.

To be considered a drought, the average balance of precipitation, ground and surface water supplies and evapotranspiration should be lower than normal over an extended period of time. If precipitation averages out for a year normally, but is received at the wrong times, a drought may be more severe than otherwise indicated by statistical measurements. Other weather events can exacerbate drought. High winds, low humidity and heat waves often increase the perception of conditions and can aggravate a drought's severity. Each of these examples of drought affects one or more economic arenas in Andrew communities. Given a significant level of severity, a drought can decimate a city, county or even a multi-state region.

Types of Drought

FEMA defines a drought as a period of prolonged dryness.

The most current standards categorize drought into five classes:

- Agricultural Drought: defined by soil moisture deficiencies;
- Hydrological Drought: defined by declining surface water and groundwater supplies;

• Meteorological Drought: defined by precipitation deficiencies;

• *Hydrological Drought and Land Use:* defined as a meteorological drought in one area that has hydrological impacts in another area; and

• *Socioeconomic Drought:* defined as droughts that impact supply and demand of some economic commodity.

Measuring Drought

To a farmer, a drought is a period of moisture deficiency that affects the crops under cultivation. Even two weeks without rainfall can stress many crops during certain periods of the growing season. To a meteorologist, a drought is a prolonged period of moisture deficiency. A drought lasting less than three months is considered to be short term; four to six months is a significant drought and more than six months can devastate a local agriculture-based economy. To a water manager, a drought is a deficiency in water supply availability and water quality. Drinking water suppliers may consider themselves in a drought status when demand for their water reaches a certain percentage of their maximum capacity to deliver the product. When temperature reaches a certain level and demand outpaces production, or it looks as if stores will be depleted before recharge occurs, drinking water suppliers may decide to invoke special rules designed to limit demand.

Drought Severity Classification

Short-term drought indicator blends focus on 1-3 month precipitation. Long-term blends focus on 6-60 months. Additional indices used, mainly during the growing season, include the USDA/NASS Topsoil Moisture, Keetch-Byram Drought Index (KBDI), and NOAA/NESDIS satellite Vegetation Health Indices. Indices used primarily during the snow season and in the West include snow water content, river basin precipitation, and the Surface Water Supply Index (SWSI). Other indicators include groundwater levels, reservoir storage, and pasture/range conditions. The Drought Monitor summary map identifies drought areas, labeling droughts by intensity, with D1 being the least intense and D4 being the most intense (see Figure 2.9). Areas labeled "D0" are drying out and/or possibly heading for drought, or are recovering from drought

but not yet back to normal, suffering long-term impacts such as low reservoir levels.



The Standard Precipitation Index (SPI) is based on the probability of precipitation for any time scale. The SPI shown in Figure 2.10 can be computed for different time scales, can provide





Source: www.ncd.noaa.gov

provide early warning of drought and help access drought severity, and is less complex than the Palmer Index, shown in Figure 2.11. The understanding of a deficit of precipitation has different impacts on groundwater, reservoir storage, soil moisture, snowpack and stream flow leading to the development of the SPI in 1993. The SPI is designed to quantify the precipitation deficit for multiple time scales. These time scales reflect the impact of drought on the availability of the different water resources. Soil moisture conditions respond to precipitation anomalies on a relatively short scale. Groundwater, streamflow and reservoir storage reflect the longer-term precipitation anomalies.



Source: www.ncd.noaa.gov

The SPI calculation for any location is based on the long-term precipitation record for a desired period. Positive SPI values indicate greater than average precipitation, and negative values indicate less than average precipitation. Because the SPI is normalized, wetter and drier climates can be represented in the same way, and wet periods can also be monitored using the SPI. The positive total of the SPI for all the months within a drought can be called the drought's magnitude. By understanding a region's SPI value and history, communities can plan for the increasing impacts of a drought as they enter into it.

Another tool, more readily understood by non-professionals, is the Palmer Drought Severity Index (PDSI), which is published jointly by NOAA and the U.S. Department of Agriculture. The Palmer index measures water supply and soil moisture. Many people in the agriculture and water utility communities use this index daily in their decision-making. When the PDSI is examined regionally, a sense of local drought conditions can be obtained.

Crop Moisture Index (CMI) is a derivative of the PDSI which looks at moisture supply in the short term for crop producing regions. The CMI monitors week-to-week crop conditions. Whereas the PDSI monitors long-term meteorological wet and dry spells, the CMI was designed to evaluate short-term moisture conditions across major crop-producing regions. Because it is designed to monitor short-term moisture conditions affecting a developing crop, the CMI is not a good long-term drought monitoring tool. The CMI's rapid response to changing short-term conditions may provide misleading information about long-term conditions. For example, a beneficial rainfall during a drought may allow the CMI value to indicate adequate moisture conditions, while the long-term drought at that location persists.

Objective Blends of Drought Indicators is a new method of predicting drought, severity and length. It is an amalgamation of other indexes and measurements with the goal of determining long- and short-term predictions. At this point, it is considered experimental. Figure 2.12 is an example of the Short-Term Drought Indicator Blend and Figure 2.13 is a comparative view of the different drought measurement indexes.



Figure 2.12

Source: www.ncd.noaa.gov

Figure 2.13

			Ranges				
Category	Description	Possible Impacts	<u>Palmer</u> <u>Drought</u> <u>Severity</u> Index (PDSI)	<u>CPC Soil</u> <u>Moisture</u> <u>Model</u> (Percentiles)	<u>USGS Weekly</u> <u>Streamflow</u> (Percentiles)	<u>Standardized</u> <u>Precipitation</u> Index (SPI)	<u>Objective</u> <u>Drought</u> <u>Indicator</u> <u>Blends</u> (Percentiles)
DO	Abnormally Dry	Going into drought: Short-term dryness slowing planting, growth of crops or pastures Coming out of drought: some lingering water deficits pastures or crops not fully recovered	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	 Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested 	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	Crop or pasture losses likely Water shortages common Water restrictions imposed	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	 Major crop/pasture losses Widespread water shortages or restrictions 	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	 Exceptional and widespread crop/pasture losses Shortages of water in reservoirs, streams, and wells creating water emergencies 	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Drought is often difficult to predict. It is the one natural disaster that comes on slowly, yet can have the most significant economic impact if it becomes extreme. Conversely, drought conditions can be remedied by nature.

Local Susceptibility

The State of Missouri is divided into six regions of similar climate conditions to classify drought susceptibility, with categories of slight, moderate and high susceptibility. Andrew County's susceptibility is rated low near the Missouri River, and high in areas outside of the influence of the Missouri River. Andrew County, as shown in Figure 2.14, falls in the highly likely probable category on the risk scale, as the majority of the county's agricultural production areas lay in the high susceptibility zone.





Source: DNR, Missouri Drought Plan, 2002

The effects include crop and livestock failures, drinking water supply depletion and economic disruptions. While the underlying geology of water saturated alluvium allows for ample groundwater supplies, these supplies take time to develop and can be considerably more expensive to tap than surface waters. They can also be of poorer quality than surface water drinking supply sources.

Historic Occurrences

The Federal Emergency Management Agency (FEMA) website lists one presidential disaster declaration with drought. This took place in September 1976. Since then, Missouri governors have identified a handful of drought disaster events, including February 2003 when Gov. Bob Holden declared 29 Missouri counties as disasters due to drought, including Andrew County. Drought had gripped the northern and western portions of the state since the previous summer. Gov. Holden asked for the disaster designations to help Missouri farmers whose corn yields in 2002 were down 21 percent from 2001. The soybean crop was off 11 percent from the year before.

A drought occurring in the fall and winter of 1988 created a water shortage in January and February 1989 because the water level was too low for the local water utility's pumps to extract water from the river. Fire trucks were used to pump water from the Missouri River to the water processing plant to provide water for fire protection. Drinking water was rationed as the shortage lasted several days.

Missouri was impacted by persistent drought in 2012. The University of Missouri and the Food and Agricultural Policy Research Institute estimated the financial losses to Missouri livestock and poultry operations exceeded \$547 million. Drought caused several agriculture-related disaster declarations for the county, as shown in Figure 2.15.

Andrew County - Drought						
Location	Date	Туре	Property	Crop Damage		
ANDREW	04/01/2000	Drought	0.00K	0.00K		
ANDREW	07/01/2012	Drought	0.00K	0.00K		
ANDREW	08/01/2012	Drought	0.00K	0.00K		
ANDREW	09/01/2012	Drought	0.00K	0.00K		

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				_	-

ANDREW	10/01/2012	Drought	0.00K	0.00K	
ANDREW	11/01/2012	Drought	0.00K	0.00K	
ANDREW	12/01/2012	Drought	0.00K	0.00K	
ANDREW	01/01/2013	Drought	0.00K	0.00K	
ANDREW	02/01/2013	Drought	0.00K	0.00K	
ANDREW	03/01/2013	Drought	0.00K	0.00K	
ANDREW	09/01/2013	Drought	0.00K	0.00K	
Totals:			0.00	.000K	
Source: <u>https://www.ncdc.noaa.gov/stormevents/</u>					

Thirty residents in Andrew County participated in emergency cost-share assistant contracts to drill or deepen wells or expand irrigation systems to address water needs brought on by the drought (see Figure 2.16).





Location

All areas of Andrew County are at risk for drought.

Probable Severity:

Andrew County is susceptible to drought in any given year. The DNR's drought response system has four phases. Phase 1 begins when water monitoring analysis indicates anticipated drought consequences. The situation moves into Phase 2 when the PDSI reads -1.0 to -2.0. At the same time, stream flow, reservoir levels and groundwater levels are below normal over a period of several months. Phase 3 is based on a PDSI between -2.0 to -4.0 and various other factors. Phase 4, or activation of drought emergency procedures, generally begins when the PSDI exceeds -4.

Probable severity levels of a future drought are:

Phase:	Probable Severity:
Phase 1, Advisory:	Negligible
Phase 2, Alert:	Limited
Phase 3, Conservation:	Limited
Phase 4, Emergency:	Critical

Depending on the duration of a drought, it would lead to limitations on water use by domestic and commercial users, and adverse impacts on the agriculture sector of the economy. The impact could extend to tertiary sectors of the economy that depend on farming. While modern soil conservation efforts can help conditions from getting as severe as the Dust Bowl era, a deep and prolonged drought could cause catastrophic effects.

Probable Risk

Although it would be best to use at least a 20-year period from which to draw data on drought events in order to obtain a more accurate estimate of probability, only an 18-year record period is

available from the NCDC. Over the 18-year record period, Andrew County was in a drought for 11 months. There are a total of 216 months in the record period. The calculated risk percent from the number of months of drought and the total number of months in the record period equates to the annual average percentage of 5.09% probability of drought occurrence in the county.

Adverse Impact

The impact of the drought would depend on the severity and length of the drought. The impact to agriculture and related businesses would initially be limited, but could reach critical stages, also affecting drinking supplies, industry, the environment and potentially health.

Earthquake

The earth's crust is made up of gigantic plates (tectonic plates) that float on the semiliquid inner core of the earth. The plates are always in motion, although the motion is very slow and not noticeable without instrumentation. Where the plates join or have volcanic activity they form long linear boundaries. The stress is built up and stored at the boundary of these tectonic plates. The sudden release of stress creates a seismic wave which is often felt as an earthquake. Earthquakes have different levels of intensity. The Federal Emergency Management Agency (FEMA) describes an earthquake as a sudden rapid shaking of the earth caused by the breaking and shifting of rock beneath the surface.

While most earthquakes are caused by movement of the earth's tectonic plates, human activity can also produce earthquakes. Four main activities contribute to this phenomenon: storing large amounts of water behind a dam (and possibly building an extremely heavy building), drilling and injecting liquid into wells, and by coal mining and oil drilling.¹ Perhaps the best known example is the May 2008 Sichuan earthquake in China's Sichuan Province; this tremor resulted in 69,227 fatalities and is the 19th deadliest recorded earthquake. The Zipingpu Dam is believed to have fluctuated the pressure of the fault...; this pressure probably increased the power of the earthquake and accelerated the rate of movement for the fault.² Human activity accelerating movements of faults is growing in the central United States due to the fracking in the oil industry and the escalating number of earthquakes in the region.

The BBC writes, "Fracking is the process of drilling down into the earth before a highpressure water mixture is directed at the rock to release the gas inside. Water, sand and chemicals are injected into the rock at high pressure which allows the gas to flow out to the head of the well."³ See Figure 2.17. The US Geological Survey (USGS) notes they believe this endeavor leads to seismic activity. USGS reports, between the years 1973 and 2008, there was an average of 21 earthquakes of magnitude three and larger (M3+) in the central and eastern United States. This rate jumped to an average of 99 M3+ earthquakes a year in 2009 and 2013, and the rate continues to rise. In 2014, alone, there were 659 M3+ and larger earthquakes.

¹ Madrigal, Alexis, "Top 5 Ways to Cause a Man-Made Earthquake", <u>Wired News</u>, June 2008

² "How Humans Can Trigger Earthquakes", National Geographic, February 10, 2009

³ "What is Fracking and Why Is it Controversial", <u>BBC News</u>, December 16, 2015
While this has not directly affected Andrew County, there may be long-term effects for the region.



Figure 2.17

Tremors associated with earthquakes can be very brief or can last as long as five minutes. They can reoccur quickly or in increasing intervals. They can even persist over several months. The larger shock waves can cause ground failure, landslides, liquefaction, uplifts and sand blows.

The Richter scale is one of the most commonly mentioned intensity scales. The USGS notes that earthquakes less than 2.0 on the Richter scale are called microquakes and are usually not felt by people, but recorded only on local seismographs. Events with a magnitude above 4.5 are recorded by seismographs all over the world. The largest known shocks have had magnitudes of 8.9. The Richter scale does not measure damage from earthquakes. The Modified Mercalli Intensity Scale gets far less attention, but is a better representative of the impact an event can have upon an area. It is described in Figure 2.18. Damage from earthquakes occur from one of several causes. Seismic waves can cause the ground to shake in horizontal and vertical vibrations. Buildings are more susceptible to damage from horizontal motion than from vertical motion.

Surface faulting is the second cause of earthquake damage. This phenomenon is defined as the offset or tearing of the earth's surface by a differential movement across a fault, which

Source: http://eciu.net/

Tectonic uplift and subsidence is the third earthquake phenomenon. In the 1964 Alaska earthquake, structures were leveled to sea level, resulting in permanent or intermittent inundation. Tectonic uplift caused shallowing of harbors and waterways.

Figure 2.18

	Abbreviated description of the 12 levels of Modified Mercalli intensity.
Ι	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
Х	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.



Earthquake induced failures is the fourth earthquake damage-causing phenomenon. One effect

in this group is liquefaction. During strong shaking, areas having clay-free sands, silts, and groundwater within 30 feet of the surface can temporarily lose strength and behave like fluids. Structures found on these materials can settle, tip or be ripped apart as the ground spreads laterally or flows. Landslides occur when an earthquake dislodges rock and debris on steep slopes, triggering rock falls, avalanches



Source: <u>http://quake.wr.usgs.gov/prepare/factsheets/NewMa</u> <u>drid/Charleston1895.gif</u>

and slides. Further, most clay soils lose shear strength when disturbed by ground shaking.

Because Andrew County

is located near the middle of the North American Continent, far away from volcanoes and historic earthquake zones, some incorrectly assume it is not subject to the risk of an earthquake. While very infrequent and usually only barely detectable,

earthquakes do occur in the region.

Two fault areas may have some effect upon Andrew County: the New Madrid fault (see Figure 2.20) in southeast Missouri and the Nemaha fault in eastern Kansas. The greatest risk is from the Nemaha fault, which stretches roughly from Oklahoma City, Ok., north to Lincoln, Ne., about 60 miles west of Andrew County.

The New Madrid seismic zone has a record of earthquakes in southeast Missouri prior to the 19th century. While the written record is not detailed, there is ample geologic evidence that



the New Madrid seismic zone has a long history of activity. A French missionary traveling down the Mississippi River reported a tremor on Christmas Day in 1699, while he was encamped near the location of present-day Memphis, Tenn. At 2:00 a.m. on Dec. 16, 1811, the strongest earthquake to occur in the United States struck New Madrid. The course of the Mississippi River was changed, houses were flattened and the effects of the quake were felt as far away as central New York State.



Figure 2.20 - Area Peak Acceleration Expectations for the Next 50 Years

Source: <u>http://neic.usgs.gov/neis/states/missouri/hazards.html</u> <u>http://neic.usgs.gov/neis/states/kansas/hazards.html</u>

The New Madrid fault can be seen in Figure 2.20 as the red area in southeast Missouri and northeast Arkansas. The Nemaha fault is the bowling pin shaped green area in eastern Kansas and southeast Nebraska in the other map above. The map illustrates the potential magnitude to be expected in the next 50 years from both of these faults. While Andrew County is located in a zone of low damage potential, caution is warranted.

Historic Occurrences

On April 24, 1867, St. Joseph, Mo., which is located to the south of Andrew County, experienced a 7.0 earthquake according to the Modified Mercalli Intensity Scale. According to newspaper accounts, windows broke, plaster fell, solid bricks swayed and walls cracked. It was reported that the brick walls of the schoolyard cracked several feet from the ground. On Jan. 7, 1906, St. Joseph experienced a 5.0 to 6.0 earthquake according to the MMI Scale. Newspaper accounts indicate the event rattled dishes and "tinware," detached several pictures from walls,

swayed floors and frightened residents. There was no serious damage reported. A similar incident occurred in 1969. No information was recorded for Andrew County for these events.

Location

All areas of Andrew County share an equal risk of earthquake.

Probable Severity

In 1997, the Department of Natural Resources and the Division of Geology and Land Survey created a seismic survey of the St. Joseph area. The survey was completed to explore a potential surface rupture in south St. Joseph, which is within 20 miles of Andrew County. Research to date has not concluded where the potential surface rupture originated or if it is active. The City of St. Joseph has a potential seismic risk of II on the Mercalli scale. The State of Missouri offers the map in Figure 2.21 as the projected earthquake intensity estimate for the state. For a 7.6-magnitude earthquake along the New Madrid fault, Andrew County is located within the VI intensity range, indicating slight damage.

Figure 2.21



Mercalli Level of Probably Risk of Occurrence

I – III: Likely	
IV-VI: Possible	

VII-IX: Unlikely X-XIII: Unlikely

Source: <u>www.dnr.mo.gov</u>

Indirect hazards may occur at great distances from large earthquakes. Liquefaction disintegration of alluvial soils, landslides and life-line disruptions will most affect areas closest to the epicenter, but may occur at significant distances. Subsurface conditions of the Mississippi and Missouri River valleys tend to amplify earthquake ground shaking. As a result, much of Missouri is at risk from earthquakes.

Probable Risk

Without a historical record for earthquakes in Andrew County it is not possible to calculate a precise probability of earthquake occurrence. The Center for Earthquake Research and Information (CERI) at the University of Memphis has computed conditional probabilities of a magnitude 6.0 earthquake in the New Madrid seismic zone. According to a fact sheet prepared by SEMA in 2003, the probability for a magnitude 6.0 to 7.5 or greater earthquake along the New Madrid Fault is 25 to 40 percent over the next 50 years. At the 25% level, the likelihood of an earthquake happening in a given year is 1.0%. At the 40% level, the likelihood of an earthquake happening in a given year is 1.6%. As previously stated, Andrew County is located in the VI risk zone.

Adverse Impact

The impact on the general public, businesses, services and the infrastructure may be lessened if precautions are undertaken at multiple levels. Increased education, concern and subsequent action can reduce the potential effects of an earthquake, and can be done in conjunction with preparations for other natural hazards.

Individuals can reduce their own vulnerability by taking some simple and inexpensive actions within their own households. Local government can take action to lower the threat through regulation of new development, assuring that vital or important structures resist hazards and developing infrastructure in a way that decreases risk. State agencies and the legislature can assist the other levels of action and provide incentives for minimizing hazards. Based on USGS projections, Andrew County is most at risk for Modified Mercalli Level VI, which would have a limited impact.

Floods and Levee Failure

Floods are the second most common and the most costly disaster in the United States after fire. Many communities experience some sort of flooding after periods of heavy rain or when winter snow thaws. Floods can develop slowly or occur in a matter of seconds; yet, are among the more easily predictable natural disasters. SEMA's State Hazard Analysis describes a flood as a partial or complete inundation of normally dry land areas. Riverine flooding is defined as the overflow of rivers, streams, drains and lakes due to excessive rainfall, rapid snowmelt or ice. Because flash floods can develop in just a matter of hours, most flood related deaths result from this type of flooding event.

Flat areas next to rivers and streams, that carry excess water during high flow events, are called floodplains (see Figure 2.22). Unfortunately these areas can also be the most desirable areas for construction of buildings and habitation. Many of these floodplain areas handle all but the most excessive floodwaters without damage to human settlements. However, construction has continually encroached into the flood plain and developments have suffered flood-related disasters.

The "100-year floodplain" is that area in which a flood has a one percent chance of occurring each year. See Figure 2.23. In other words, the area within the boundary of the 100-year floodplain should, on average, be flooded at least once every hundred years. See Appendix B for a map of the 100-year and floodplain within Andrew County. These floodplains exist within an area called a watershed or drainage basin.

Drainage basins are the complete



Figure 2.22

Source: Quick Guide, Missouri SEMA-<u>www.floodplain.sema</u> .dps.mo.gov

area drained by a river or stream. Andrew County is drained wholly by the Missouri River basin, which drains much of the nation. In some instances, flooding may not be caused directly by a river, stream or lake overflowing its banks. It may simply result from a combination of

excessive rainfall and/or snowmelt, saturated ground and inadequate drainage. Under these circumstances, water will find the lowest elevations. Often these areas are not in an identified floodplain. This type of flooding is called sheet flooding and it becomes increasingly prevalent as development (hard surfaces, buildings, etc.) outstrips the ability of natural drainage.



Figure 2.23

Source: Quick Guide, Missouri SEMA- <u>www.floodplain.sema.dps.mo.gov</u>

Flooding can also occur when storm and sanitary sewers cannot handle extreme volumes of water flow following storm events. As a result, water can back into basements, which may damage mechanical systems and create serious public health and safety concerns. Intense storms dropping large amounts of rain within brief periods cause flash floods. Many times, flash floods occur with little or no warning and can reach full intensity in only a few minutes, while an overabundance of surface water upstream from the affected area causes riverine floods with slower onsets.

A number of factors contribute to susceptibility to a stream flood. Variables include topography, ground saturation, previous rainfall amounts, soil types, drainage, basin size, drainage patterns of streams and vegetative cover. When soil is saturated, additional rainfall results in more runoff and contributes to flooding. When vegetative ground cover is removed and replaced with extensive amounts of asphalt, concrete and buildings flash floods are more common. In this circumstance, water finds its way into adjacent streams and flooding may occur either slowly or become a flash flood as a result. The National Weather Service has three response levels for alerting the public to the danger of floods (see Figure 2.24.)

Figure 2.24

National Weather Service Response Level Activity				
Flood Warning	Flash flooding or flooding has			
	been reported or is imminent.			
	Take the necessary precautions at			
once.				
Flood Watch	Flash flooding or flooding is			
	possible within the designated			
	area.			
Flood Advisory	Flooding of small streams, streets			
	or low-lying areas, such as			
	railroad underpasses and urban			
	storm drains is occurring.			

Flood mitigation includes any activities that prevent an emergency, reduce the chance of an emergency hap-pening or lessen the damaging effects of unavoidable emergencies. Research in mitigation alternatives will help reduce the amount of structural damage to structures, financial losses and crop losses. Such mitigation steps include engaging in floodplain management

Source: National Weather Service

activities (planning and zoning), constructing barriers, such as levees and purchasing flood insurance.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

Participation in the NFIP is based on an agreement between local communities and the federal government that states if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in special flood hazard areas, the government will make flood insurance available within the community as a financial protection against flood losses.

Participating communities in Andrew County include the county and the communities of Amazonia, Bolckow, Country Club Village, Rosendale and Savannah (see Figure 2.25). Each of these communities will continue to participate in the program by enforcing floodplain management requirements, regulating new construction within the flood plain and raising existing structures above flood levels. The communities of Cosby, Fillmore and Rea are eligible, but do not currently participate in NFIP.

Figure 2	.25
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Participation in NFIP					
Andrew County	Yes				
Amazonia	Yes				
Bolckow	Yes				
Cosby	No				
Country Club Village	Yes				
Fillmore	No				
Rea	No				
Rosendale	Yes				
Savannah	Yes				

Source: FEMA National Flood Insurance Program Community Status Book

Historic Occurrences

Andrew County's location on the Missouri River and the many streams and tributaries that flow through the county have contributed to its long history of flooding. The region has suffered devastating floods in 1881, 1952, 1993 and 2011 as the Missouri River spilled from its banks. On May 1, 1881, the *St. Joseph Gazette* published a story suggesting the importance of a relief fund for the "scores and hundreds of people who have been driven from their homes." In April of 1952, a

Missouri, bringing 10 billion gallons of water an hour, and matching the devastation of 1881. After the flood receded, the Corps of Engineers developed a mitigation plan to take out the wide bend in the river that wrapped around the Rosecrans Airfield and force the river into a new and less flood-prone channel.

The largest and most devastating river flooding occurred during the summer of 1993 when the river reached a record breaking level of 33.7 feet. In St. Joseph there were \$50 million to \$75 million in damages and lost production. The area's potable water supply was lost when the Missouri American Water Co. plant was flooded, and a major employer, Sherwood Medical Supplies, closed and relocated after its facilities were completely covered with floodwater.

The National Weather Service described how excessive rainfall occurring from April to July 1993 produced severe to record flooding in a nine-state area of the upper Mississippi River basin. Heavy rainfall across Kansas and Missouri contributed to flooding in much of the lower Missouri River basin, which led to a chain reaction of flooding along the Kansas River and its tributaries. In many rural locations, the Flood of 1993 reached 100-year to 500-year flood discharges and river levels. The end result was catastrophic flooding at many locations along the Missouri and Mississippi rivers. The area extent of flooding in 1993 was extraordinary, encompassing parts of nine states in the Midwest. When the waters finally receded, the flood had claimed 47 lives and caused billions of dollars in damages.

According to the U.S. Army Corps of Engineers, a high percentage of crop acres in the Kansas City District floodplain area suffered losses due to the overtopping of nine of the fifteen units in the federally constructed Missouri River Levee System and virtually all of the non-federal farm levees in the district. More than 1.4 million crop acres were classified as failed due to the flood, which resulted in damages totaling \$359 million. In 1993, the late start and long duration of flooding prevented many farmers from planting a crop in the first place, and if they did, many fields were flooded later, allowing no chance to replant or salvage the crop.

The Midwest suffered from a major flooding disaster in 2011 when the "Missouri River... basin experienced widespread record flooding from May through August 2011. This flood event had a major impact on numerous communities and livelihoods along the river basins. Major damage was inflicted on residences, businesses, infrastructure, transportation, and agriculture. Despite the record flooding, some property damage was mitigated and fatalities were limited, due... (to) advanced warning and decision support services.... Major flooding impacted the states of Montana, North Dakota, South Dakota, Iowa, Nebraska, Kansas and Missouri."⁴ Another report by the United States Geological Survey (USGS) entitled, *The Effects of Missouri River Mainstem Reservoir System Operations on 2011 Flooding Using a Precipitation-Runoff Modeling System Model*, noted "In 2011 the Missouri River... System experienced the largest volume of flood waters since the initiation of record-keeping in the nineteenth century." Despite the event causing over \$2 billion in damages and five fatalities, Andrew County was spared from major devastation.

The National Weather Service records 29 flood events that have occurred in Andrew County since the Flood of 1993. Damage from the storm, as noted in Figure 2.23, is for the entire flooded area, not just Andrew County.

⁴ U.S. Department of Commerce/National Oceanic and Atmospheric Administration, *Service Assessment, The Missouri/Souris River Floods of May-August 2011*, May 2012

Fig	ure	2	.26

<u>Location</u>	<u>Date</u>	<u>Type</u>	<u>Death</u>	<u>Inj</u> ury	<u>Property Damage</u>	<u>Crop Damage</u>
ANDREW COUNTY	09/21/1993	Flood	1	0	500.00K	0.00K
ANDREW COUNTY	11/14/1993	Flood	0	0	50.00K	50.00K
MISSOURI RIVER	05/07/1995	Flood	0	0	2.80M	2.00M
MISSOURI RIVER	06/06/1995	Flood	0	0	700.00K	0.00K
ANDREW COUNTY	07/04/1995	Flood	0	0	0.00K	0.00K
ANDREW COUNTY	08/02/1995	Flood	0	0	0.00K	0.00K
MISSOURI RIVER	06/26/2000	Flood	0	0	0.00K	0.00K
MISSOURI RIVER	02/24/2001	Flood	0	0	0.00K	0.00K
MISSOURI RIVER	06/14/2001	Flood	0	0	0.00K	0.00K
MISSOURI RIVER	05/25/2004	Flood	0	0	0.00K	0.00K
MISSOURI RIVER	05/30/2004	Flood	0	0	0.00K	0.00K
WHITESVILLE	06/12/2004	Flash Flood	0	0	0.00K	0.00K
BOLCKOW	06/13/2004	Flash Flood	0	0	0.00K	0.00K
ROSENDALE	06/13/2004	Flash Flood	0	0	0.00K	0.00K
SAVANNAH	07/16/2004	Flash Flood	0	0	10.00K	0.00K
SAVANNAH	09/18/2004	Flash Flood	0	0	0.00K	0.00K
ANDREW (ZONE)	05/13/2005	Flood	0	0	0.00K	0.00K
SAVANNAH	06/04/2005	Flash Flood	0	0	0.00K	0.00K
ROSENDALE	05/01/2006	Flood	0	0	0.00K	0.00K
BOLCKOW	05/06/2007	Flood	0	0	4.00K	1.00K
FILLMORE	05/06/2007	Flash Flood	0	0	0.00K	0.00K
MIDWAY	08/24/2007	Flood	0	0	0.00K	0.00K
ROSENDALE	03/02/2008	Flood	0	0	0.00K	0.00K
AVENUE CITY	05/15/2009	Flash Flood	0	0	0.00K	0.00K
MISSOURI RIVER	08/12/2011	Flood	0	0	0.00K	0.00K
ROSENDALE	05/17/2015	Flash Flood	0	0	0.00K	0.00K
REA	06/11/2015	Flash Flood	0	0	0.00K	0.00K
NODAWAY	06/11/2015	Flash Flood	0	0	0.00K	0.00K

BOLCKOW	07/16/2015	Flash Flood	0	0	0.00K	0.00K		
Totals:			1	0	3.51M	2.00M		
Source: https://www.ncdc.noaa.gov/stormevents/								

Figure 2.27 is table showing repetitive loss properties on record for Andrew County with the State Emergency Management Agency.

Figure 2.27

Repetitive Loss Table							
Community	Number	Occupancy	Properties	Losses	Data Type		
Unincorporated Andrew County	290004	Single Family	6	13	Non-mitigated		
Rosendale	290008	Single Family	1	2	Non-mitigated		

Source: SEMA

Levee Failure

Andrew County has one federal levee along the Missouri River. The levee near Amazonia is L476 in the Missouri River Levee System. The levee is built to withstand a 500year flood. The levee protects an area that is mostly agriculture land, but also includes the well fields of the Missouri American Water Co.

This information was obtained through interviews with a Corps employee. Detailed information about levee failure is not available at this time. The U.S. Army Corps of Engineers is compiling inundation maps to assess the impact of levee failure. This information will be included in the next update of the plan as it becomes available

Location

Areas of Andrew County most at risk for flooding are the unincorporated areas adjacent to the Missouri River, the community of Rosendale and portions of Amazonia and Bolckow. **Probable Severity**

In terms of overall damage, Missouri's most severe single hazard is flooding, according to SEMA. While the state averages some 28 tornadoes each year, damage is generally confined to small areas with few fatalities, if any. By contrast, flooding has resulted in more federal disaster declarations in Missouri than any other hazard in the past three decades.

Missouri's vulnerability to flooding is greatly increased because it is subject to flooding from two principal sources: the Missouri River Basin and the Upper Mississippi River Basin. Over one-third of the annual monetary losses due to flooding in the Missouri River Basin occur in Missouri.

Floods in Andrew County will include negligible damage from flash flooding which will likely occur every year. It is possible that limited or critical flooding will occur in any given year. Catastrophic damage may only occur every 100 years. The county's overall risk is critical. **Probable Risk**

Given the county's geographic location, multitude of rivers and streams, soil type and proximity to the Missouri River, flooding events are likely. There have been a total of 28 reported flood events in Andrew County from 1996 to 2015 in the NCDC storm event database. Of those, 12 have been flash floods. Using a 20-year period of record, this equates to a 60% probability of occurrence in the county in a given year. During this same time period there have been 10 riverine floods reported in the county, this equates to a riverine flood events every two years or a 50% probability of occurrence in any given year.

Adverse Impact

Mitigation efforts have been performed in the last five years to reduce flooding impact, but it continues to be a risk for the county.

While Andrew County is susceptible to catastrophic flooding, a majority of the county's population lives outside of the 100-year floodplain. Furthermore, there a no large urban areas located inside the county. The lack of large areas covered in hard surfaces, i.e. concrete, decreases the risk of flash flood as well. The next disaster's impact on the overall county will likely be low, with short-lived interruptions in the transportation network, such as washed out bridges or underwater roads, the most common disruption.

Heat Wave

Heat kills human beings by pushing their bodies beyond their natural limits. The body's internal thermostat produces perspiration that evaporates and cools the body under normal circumstances. However, evaporation is slowed in extreme heat and high humidity and the body must work extra hard to maintain a normal temperature.

Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions can provoke dust storms and low visibility. A heat wave combined with a drought can create a dangerous situation.

Heat kills about 175 Americans every year, second only to severe winter weather among natural disasters to cause death, according to the National Weather Service (NWS). In addition, heat waves cause other health problems to progress more rapidly. The elderly and children are especially vulnerable.

Missouri experiences about 40 days per year above 90°F. July leads the statewide mean with 15 days above 90°F degrees, followed by August with an average of 12 days over 90°F. June and September average six days and four days respectively for temperatures above 90°F during the same 30-year period.

Ambient temperature, however, is only one factor to consider in measuring the effect of heat. High humidity, which often occurs in Andrew County, along with exposure, wind and activity, must also be taken into consideration. The NWS has devised a Heat Index (Figure 2.28) that combines air temperature and relative humidity to measure how hot it really feels.

These Heat Index values were devised for shady, light wind conditions. Exposure to full sunshine can increase the Heat Index values by up to 15°F. Strong winds, particularly of hot, dry air, can cause rapid evaporation of perspiration, and dangerously increase body temperature.

The most accurate measure of environmental heat stress is the Wet-Bulb Globe Thermometer index, which measures three forms of heat load. A variety of human physiological effects can result from heat waves, which are shown in Figure 2.29.

NOAA's National Weather Service

Heat Index

	Temperature (°F)																
		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
(%)	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
<u>></u>	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
dit	60	82	84	88	91	95	100	105	110	116	123	129	137				
Ē	65	82	85	89	93	98	103	108	114	121	128	136					
ヹ゠	70	83	86	90	95	100	105	112	119	126	134						
Ve	75	84	88	92	97	103	109	116	124	132		•					
lati	80	84	89	94	100	106	113	121	129								
Re	85	85	90	96	102	110	117	126	135								
-	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
	100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

🗌 Caution 🛛 Extreme Caution 🗧 Danger 📕 Extreme Danger

Source: http://www.srh.noaa.gov/oun/?n=safety-summer-heatindex

Figure 2.29

Heat Disorder	Symptoms	First Aid
Sunburn	Skin redness and pain, possible swelling, blisters, fever, headaches.	Take a shower, using soap, to remove oils that may block pores preventing the body from cooling naturally. If blisters occur, apply dry, sterile dressings and get medical attention.
Heat Cramps	Painful spasms usually in leg and abdominal muscles. Heavy sweating.	Firm pressure on cramping muscles or gentle massage to relieve spasm. Give sips of water. If nausea occurs, discontinue.
Heat Exhaustion	Heavy sweating, weakness, skin cold, pale and clammy. Weak pulse. Normal temperature possible. Fainting, vomiting.	Get victim to lie down in a cool place. Loosen clothing. Apply cool, wet cloths. Fan or move victim to air-conditioned place. Give sips of water. If nausea occurs, discontinue. If vomiting occurs, seek immediate medical attention.
Heat Stroke (Sun Stroke)	High body temperature (106+). Hot, dry skin. Rapid, strong pulse. Possible unconscious- ness. Victim will likely not sweat.	Heat stroke is a severe medical emergency. Call 9-1-1 or emergency medical services or get the victim to a hospital immediately. Delay can be fatal. Move victim to a cooler environment. Try a cool bath or sponging to reduce body temperature. Use extreme caution. Remove clothing. Use fans and/or air conditioners. DO NOT GIVE FLUIDS.

Source: http://www.srh.noaa.gov/oun/?n=safety-summer-summersafety

The severity of heat disorders tends to increase with age. Heat cramps in a 17-year-old can become heat exhaustion for someone in their 40s, and may result in a fatal stroke for someone in their 60s. Population groups at risk of becoming very sick from heat waves are: elderly, children, overweight or underweight people, people with limited independence due to physical or mental disorders, people without air conditioning, people working in heat under stress (firefighters, police, EMS), people in urban environments where heat is retained in asphalt and concrete, people with increased risk from work or leisure activities, people who work outdoors (utility, construction crews, etc.), military personnel and trainees, athletes, people who live alone and the homeless.

Historic Occurrences

Heat waves are to be expected in Andrew County in the summer months, particularly in July and August. Extreme temperatures can also occur in June and September. There are twelve recorded extreme heat events in the National Climatic Data Center (NCDC) database from Jan. 1, 1995 to Dec. 31, 2015 for Andrew County, as shown in Figure 2.30. There were no deaths, injuries or property and crop damage associated with these events in the NCDC data.

Andrew County Heat Events 1995-2015								
General Location	Date	Туре	Deaths/ Injuries	Property Damage	Crop Damage			
Andrew County	7/18/1999	Heat	0	0.00K	0.00K			
Andrew County	8/28/2000	Heat	0	0.00K	0.00K			
Andrew County	9/1/2000	Heat	0	0.00K	0.00K			
Andrew County	7/6/2001	Heat	0	0.00K	0.00K			
Andrew County	7/17/2001	Heat	0	0.00K	0.00K			
Andrew County	8/1/2001	Heat	0	0.00K	0.00K			
Andrew County	8/9/2001	Heat	0	0.00K	0.00K			
Andrew County	7/14/2003	Heat	0	0.00K	0.00K			
Andrew County	7/21/2005	Heat	0	0.00K	0.00K			
Andrew County	7/16/2006	Heat	0	0.00K	0.00K			
Andrew County	7/29/2006	Heat	0	0.00K	0.00K			
Andrew County	Andrew County 8/1/2006 Heat 0 0.00K 0.00K							
Source: NOAA N	ational Climatic	Data Center.	https://ww	w.ncdc.noaa.go	v/stormevents/			

Location

The entire area of Andrew County would be affected by a heat wave.

Probable Severity

Due to increased awareness of assisting vulnerable populations and wider availability of cooling shelters and air conditioners the planning committee felt the effect of a heat wave would be limited.

Probable Risk

The probability that an extreme heat event will occur in Andrew County in any given year is 30% or one event about every three years. This equates to dividing six years with an event period by the total number of years in the record period from 1995 to 2015 (20). The events recorded in the NCDC database describe prolonged periods were temperatures rose above at least 90° for at least 12 consecutive days. Heat advisories and warnings are issued for shorter periods of extreme heat nearly every year and may not meet the threshold for consecutive days in the NCDC database.

Adverse Impact

The elderly and young children are among the most susceptible during heat waves. All public schools in Andrew County – Savannah, North Andrew and Avenue City – are completely air conditioned, which significantly limits the impact of heat wave on children. The county has taken other steps to mitigate the effect of heat wave. The county partners with Community Action Partnership to provide fans and air conditioners to the elderly and low-income households. Air conditioned shelters have been designated, including Andrew County's Senior Center.

Land Subsidence/Sinkholes

Land subsidence is sinking of the earth's surface due to the movement of earth materials below the surface. This sinking can be sudden or gradual and is generally attributed to the removal of subsurface water or the draining of organic soils.

In Missouri, subsidence is primarily associated with sinkholes. According to the state's Hazard Mitigation Plan, sinkholes occur when the subsurface rock below the surface is limestone, carbonate rock, salt beds, or some other rock that can be naturally dissolved by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapses. In Missouri, sinkhole problems are usually a result of surface materials eroding and collapsing into cave openings. These collapses are called "cover collapses" and geologic information can be applied to predict the general regions where collapse will occur. Sinkholes range in size from several square yards to hundreds of acres and may be quite shallow or hundreds of feet deep.

Sinkhole formation is most intense where the bedrock is most soluble and has been exposed to extended periods of weathering and where surficial materials are between 40 and 80 feet in thickness and are composed of relict bedrock structure residuum containing clays with low dry densities. Bedrock faulting also contributes to deep weathering, cave formation and sinkhole formation.

Sinkholes are a common geologic hazard in southern Missouri, but also occur in the central and northeastern parts of the state. However, they are not common in Northwest Missouri, where Andrew County is located.

Historical Occurrences

There are no recorded instances of a major or damaging land subsidence in Andrew County.

Location

The Missouri Department of Natural Resources has identified one area in Andrew County as susceptible to sinkholes. See Figure 2.31. The Jann Sinkhole is located in south central Andrew County. See Appendix B for a map of the sinkhole location. However, no problems are known to be associated with this area.



Probable Severity

Andrew County is generally not susceptible to major land movements, so any such events would have negligible damage.

Statement of Probable Risk

Without a historical record for sink holes in Andrew County it is not possible to calculate a precise probability of sinkhole occurrences. The soil and subsoil structure of Andrew County make significant land movement events unlikely, even in the high slope areas such as the bluffs of the Missouri River. The probable risk of land subsidence is low.

Adverse Impact

Land subsidence would have minimal impact in Andrew County, temporarily closing roadways in the immediate area or causing minor damage to structures in the movement path.

Severe Winter Weather

Andrew County's location in the northwest corner of Missouri makes it susceptible to severe winter weather. The most recent event occurred on February 4 and 5, 2014. The county received about 12 inches of snow, in addition to ice. The county hired two additional graders to assist in clearing roads, costing approximately \$3,000.

There are four basic types of severe winter weather:

Freezing Rain – This type of rainfall occurs when the ground surface temperature is below water's freezing point. Rain falls in a liquid state and solidifies upon impact. Freezing rain can destroy trees, power and communications lines, and buildings, as well as making it extremely difficult to drive or walk..

Sleet – This form of precipitation freezes before hitting the ground. Sleet is not as dangerous as freezing rain, but after some accumulation can cause hazardous conditions.

Snow – This form of precipitation results from accumulation of small ice crystals around microscopic airborne particulate matter. The crystals build in the tops of clouds until they become too heavy to remain suspended in the air.

Extreme Cold – Hypothermia can occur during longer periods of exposure when the body temperature drops below 95 F. A person will become disorientated, confused and shiver uncontrollably, eventually leading to drowsiness and apparent exhaustion. In severe cases, death is possible.

A winter storm can be a half hour of wind and heavy snow on an otherwise mild day, to the onset of several days of sub-zero temperatures accompanied by heavy snowfall and raging winds. Each occurrence requires different responses by civil authorities and differing levels of resources. The National Weather Service winter weather-warning program uses a multi-tier concept to increase public awareness, as described in Figure 2.32.

Some of the most devastating storms in Andrew County involved ice storms that downed power lines. A massive storm in December 2007 knocked out electricity to nearly all homes and businesses in the county, leaving many people without heat in their homes. Power was restored

National Weather Service Definitions of Winter Weather Watch and Warnings							
Hazardous Weather Outlook	Issued daily and is used to indicate that a hazardous weather event may develop in the latter portion (day 4 - 7) of the forecast.						
Winter Storm Watch	A watch is used when the risk of hazardous winter weather has increased significantly, there is a strong possibility it will reach warning criteria, and falls in the 12 to 48 hour portion of the forecast.						
Winter Storm Warning	A warning is issued when a hazardous winter weather event is occurring, is imminent, or has a very high probability of occurrence. The event is considered to be life threatening. Some of the criteria needed include: heavy snow, about six inches in 12 hours, or ice accumulation of one-quarter inch or more. It is also issued when a combination of winter events will create life- threatening conditions. Each single event may not reach warning criteria, but the combination of events creates a life-threatening situation.						
Winter Advisory	These are issued for lesser events that while presenting an inconvenience do not pose an immediate threat of death, injury, or significant property damage. Example; snowfall below the warning criteria, very light freezing rain or drizzle. If caution is exercised, these situations should not become life threatening. Often the greatest hazard is to motorists.						
Blizzard Warning	Snow and strong winds will combine to produce a blinding snow (near zero visibility), deep drifts and life-threatening wind chill.						
Source: National Weather Se	rrvice						

to all homes within 10 days. Generators were brought in to power the Savannah Water District to provide drinking water. About 125 people took shelter at the Savannah High School. The ice storm resulted in a disaster declaration and a direct cost of \$222,711.

Winter storms can cause injury, death and property damage. If the storm itself does not kill or directly injure, the cascading effects of limited personal and emergency services, mobility, loss of utilities, increased dependence on non-standard heating and increased hazardous driving conditions can quickly turn a winter storm deadly.

Most storm-related deaths are indirectly related to the actual cold or precipitation from the storm. Severe winter weather-related fatalities are caused by a variety of situations that occur in this type of weather. They can range from over-exertion during snow shoveling, traffic accidents due to adverse driving conditions such as icy roads, house fires caused by unattended auxiliary

electrical heaters and carbon monoxide poisoning caused by improperly vented fireplaces. Hypothermia is the most direct cause of death and injuries from winter storms, but it is relatively rare. Other direct impacts are often economic, which are difficult to measure.

Wind chill is the term used to describe the rate of heat loss on the human body resulting from the combined effect of low temperature and wind. As winds increase, heat is carried away from the body at a faster rate, driving down the skin temperature and eventually the internal body temperature. While exposure to low wind chills can be life threatening to both humans and animals alike, the only effect that wind chill has on inanimate objects, such as vehicles, is that it shortens the time it takes the object to cool to the actual air temperature. It cannot cool the object to below that temperature. For example, if the wind chill is 20 degrees, and the air temperature is 35, water will not freeze. Water will freeze only when the air temperature reaches 32 degrees. Figure 2.33 provides a wind chill chart.

Figure 2.33

				N	10	VS	V	Vi	nc	lc	hi		CI	ha	rt	Č			
									Tem	pera	ture	(°F)							
	Calm	40	35	30	25	20	15	10	5	Ō	-5	-10	-15	-20	-25	-30	-35	-40	-45
	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-3.5	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
(hd	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
Ē	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
pd	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
W	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98
	Frostbite Times 30 minutes 10 minutes 5 minutes																		
			W	ind (Chill	(°F) =	35.	74 +	0.62	15T	- 35.	75(V	^{0.16}) -	+ 0.4	275	(V ^{0.1}	16)		
						Whe	re, T=	Air Ter	nperat	ture (º	F) V=	Wind S	peed	(mph)			Effe	ctive 1	1/01/01

Source: NOAA. http://www.nws.noaa.gov/om/winter/winter-images/windchill.gif

Andrew County has several population groups more likely to be affected by a severe winter weather event. With a significant number of elderly and people living under the poverty level, Andrew County could see greater negative impacts from a disaster than a community with different demographics. NOAA notes that in deaths related to exposure to cold, 50 percent were over 60 years old, over 75 percent were male and about 20 percent occur in the home. People 65 years of age or older are vulnerable to extreme cold, with 52 percent of the reported cases occurring persons in this age group.

Historical Occurrences

The National Weather Service records 28 serious snow and ice events in Andrew County from Jan. 1, 1995 to Dec. 31, 2015, as shown in Figure 2.34.

Andrew County Snow and Ice Storms 1995-2015	Deaths	Injuries	Property Damage	Crop Damage
Nov. 11, 1995 : The first snowfall of the season deposited one-half to one inch of snow. Several hours of freezing rain and sleet laid down a thin layer of ice on many roadways before the changeover to snow.	0	0	0	0
Dec. 8, 1995 : Several hours of freezing rain and sleet laid down a thin layer of ice on many roadways before the changeover to snow.	0	0	0	0
Feb. 21, 1997: After receiving 2 to 4 inches of rain in less than 24 hours, several hours of heavy snowfall resulted in a 1 to 5 inch snow accumulation. Power outages were reported in many locations.	0	0	0	0
Dec. 21, 1997 : A combination of rain and sub-freezing temperatures resulted in icy roads across much of Northwest and West Central Missouri.	0	0	0	0
Jan. 4, 1998 : An icy rain fell resulted in one-eighth to one-quarter inch of ice accumulation and slippery roadways. There were numerous non-injury traffic accidents reported throughout Northwest Missouri and many reports of minor injuries due to pedestrians falling on icy sidewalks.	0	0	0	0
Dec. 5, 1999: Rain changed to heavy snow and storm totals of 6 to 11 inches were reported. Law enforcement agencies report traffic accident rates four times the typical Sunday morning rate.	0	0	0	0
Dec. 10, 2000 : A storm system brought a mixed bag of winter precipitation. Precipitation began as freezing drizzle and after midnight precipitation increased in intensity and changed over to snow across the northern tier of Missouri. Snowfall totaled 3 to 5 inches.	0	0	0	0

Figure 2.34 cont'd

Jan. 28, 2001: Precipitation started as snow but quickly became freezing	0	0	0	0
rain during the morning hours. Ice accumulations ranged from one-quarter				
to one-half inch across the entire area. Numerous traffic accidents were				
reported and some schools were closed the following Monday.				
Feb. 9, 2001: A strong storm system moved across Northwest Missouri	0	0	0	0
with a variety of winter weather. Heavy snows of 6 to 8 inches fell in				
Savannah.				
Feb. 27, 2001: A storm system over the southwestern United States	0	0	0	0
resulted in significant snowfall across Northwest Missouri. Heaviest				
snows of 6 to 9 inches fell north of a St. Joseph to Trenton line. Gusty				
north winds caused blowing and drifting of the snow.				
Jan. 30, 2002: A long-lived major ice and snowstorm blasted much of	0	0	0	0
Northwest, and Northern Missouri. Ice accumulations of over an inch				
were observed. At one point 409,504 total customers were without				
electrical power in the area, with some residents without power up to two				
weeks. For the Kansas City area, the ice storm was ranked as the worst				
ever. Further north across northern Missouri, heavy snow fell generally				
along and north of a line, from St. Joseph to Trenton to Kirksville. Snow				
accumulations ranged from 8 to 14 inches.				
Dec. 9, 2003: Up to 4 inches of snow reported in the county. Northwest	0	0	0	0
winds to 40 mph caused blowing and drifting of the snow. Numerous				
accidents and schools closed.				
Jan. 4, 2004: A winter storm produced 6 to 7 inches of snow across the	0	0	0	0
area.				
Jan. 24, 2004: Widespread freezing rain event with ice accumulations up	0	0	0	0
to one-quarter of an inch.				
Feb. 5, 2004: A winter storm left a wide area of 6 to 8 inches of snow.	0	0	0	0
Jan. 5, 2004: One-quarter to three-quarters inch of ice was reported across	0	0	0	0
the area, mixed at times with sleet and snow.				
Jan. 20, 2006: A winter weather system brought a wintry mix of sleet,	0	0	0	0
freezing rain, and snow to the area. Snow amounts were from 2 to 4				
inches.				
Dec. 10, 2007: Ice accumulations from three-quarters to 1 inch were	0	0	100K	0
reported with numerous tree branches and power lines down. Several				
rounds of freezing rain were observed from Dec. 9 through Dec. 11, 2007.				
Ice rapidly accumulated on many surfaces, especially trees and power				
lines. Ice accumulation was particularly devastating along and north of the				
Missouri River. Around 165,000 residents went without power, some for				
almost two weeks. There were numerous traffic accidents from icy roads.				
Dec. 22, 2007: The rain, sleet, and freezing rain lifted north across the	0	0	0	0
area and quickly transitioned over to snow. Northwesterly winds of 20 to				
30 mph created near blizzard conditions at times. Visibilities were often				
reduced to feet at times, with widespread snowdrifts approaching 4 feet in				
height. These hazardous conditions caused numerous traffic accidents.				

Figure 2.34 cont'd

Interstate 29 was closed for a time in Andrew County.				
Feb. 5, 2008: Six to nine inches of snow was reported across the county.	0	0	0	0
Drifts were as high as three feet.				
Feb. 17, 2008: Up to seven inches of snow was reported across the	0	0	0	0
county. There was also blowing and drifting snow. There were also some				
heavy rains associated with this system, resulting in some minor river and				
creek flooding, to the east and south of the snow band.				
Dec. 19, 2008: A storm system brought widespread freezing rain to	0	0	0	0
portions of northern Missouri. Ice accumulations ranged from one quarter				
to one half inch across the area.				
Feb. 21, 2010: Yet another winter storm, in an already active winter	0	0	0	0
season, impacted much of Kansas and Missouri. Six to eight inches of				
snow was reported across the county. Blowing and drifting snow produced				
hazardous driving conditions. Snowfall reached a foot in several locations.				
Jan. 22, 2011: An Arctic Clipper moved southeast across northwest and	0	0	0	0
north central Missouri, during the evening hours of January 22 nd , into the				
morning hours of January 23 rd , 2011. Five to seven inches of snow				
prevailed across the area, with pockets of eight inches reported in a few				
locations.				
Feb. 1, 2011: Up to five inches of snow was observed in Cosby.	0	0	0	0
Visibilities were as low as ¹ / ₄ miles at times, in the blowing and drifting				
snow. Winds gusted occasionally as high as 45 mph.				
Feb. 24, 2011: The combination of up to 6.5 inches of snow, and blowing	0	0	0	0
and drifting snow, led to hazardous driving conditions across the county.				
Feb. 21, 2013: Four to six inches of snow was measured in the county.	0	0	0	0
Feb. 4, 2014: A major winter storm trekked through Kansas and Missouri	0	0	0	0
on February 4 and 5. By the time the storm finished it dropped around a				
foot of snow across the entire area.				

Source: NOAA National Climatic Data Center. https://www.ncdc.noaa.gov/stormevents/

Five cold temperature extremes events were reported in Andrew County, in the period

from 1995 to 2015, as shown in Figure 2.35.

Figure 2.35

Andrew County Cold Weather 1995-2015	Deaths	Injuries	Property Damage	Crop Damage
Sept. 22, 1995: An early season freeze and frost combined with the spring flooding earlier in the year made for one of the shortest growing seasons on record. The extent of any cron damage is	0	0	0	0
unknown since temperatures were only below freezing for less than two hours.				
Jan. 10, 1997: Very cold arctic air settled over the area. Daytime temperatures only reached the single digits, which is almost 30 degrees below normal. Nigh time low temperatures were in the single digits below zero. No record low temperatures were recorded but winds gusting up to 30 mph on the afternoon of the 10th produced wind chills as low as 30 to 50 below zero. There were reports of frostbite and hypothermia but no serious injuries or fatalities.	0	0	0	0
Oct. 6, 2000 : An unusually strong early season Arctic high-pressure system built into the central Plains. Temperatures did not climb out of the 40s on October 6-8. Lows dropped below freezing for 5 consecutive days, and record low temperatures in the 20s were established at St. Joseph on the 7th, 8th, and 9th.	0	0	0	0
Dec. 10, 2000: Except for a few hours on the 15th and 16th, temperatures remained below freezing through the entire period. Snow cover persisted from the 13th through the end of the month. Average highs were in the teens and twenties with average lows in the single digits.	1	0	0	0
Jan. 5, 2014: A polar plunge of arctic air slammed into Kansas, bringing wind chill values to around 30 degrees below zero for the morning of January 6th.	0	0	0	0

Source: NOAA National Climatic Data Center. https://www.ncdc.noaa.gov/stormevents/

Location

All of Andrew County shares an equal risk for severe winter weather.

Probable Severity Andrew County residents are accustomed to winter weather events and local

governments are well prepared to respond. Most severe winter weather events will cause

negligible damage. However, severe events, especially ice storms, could reach the critical stage.

Probable Risk

Figure 2.35 shows five cold weather events over a period of 17 years (1999-2015). This calculates to an annual percentage of 29.4 percent or about one cold weather event every three years. During this 17-year period, one death was recorded in Andrew County. Given the value of a human life by the U.S. Federal Government's Department of Transportation is six million dollars, the average annual cost of cold weather events for this period is \$352,942 (6,000,000/17 = 352,942).

Adverse Impact

Winter weather tends to affect the entire county, although ice and snow accumulations can be more severe in particular locations due to the path of the storm.

Minor storms of less than four inches of snow will likely disrupt snow for a day or less and cause school dismissals. Major storms of more than four inches of snow or an inch of ice may disrupt travel and electrical service for several days.

Severe Thunderstorms – High Wind – Lightning – Hail Severe Thunderstorms

A thunderstorm is formed from a combination of moisture, rapidly rising warm air and a force capable of lifting air such as a warm and cold front, a sea breeze or a mountain. The National Weather Service defines a severe thunderstorm as having hail of one inch or more, or wind gusts of 58 miles per hour or more. Nearly 1,800 thunderstorms are in progress over the surface of the earth at any time. The United States experiences 100,000 thunderstorms each year. Approximately 1,000 tornadoes develop from these storms. Thunderstorms can bring heavy rains which can cause flash flooding, strong winds, hail, lightning and tornadoes.

High Wind

A severe thunderstorm can produce damaging downbursts, microbursts, and straight-line winds. According to the Weather Channel, a downburst is an area of strong, downward moving air associated with a downdraft from a thunderstorm. As the downdraft impacts the ground, the air is forced outwards in all directions while it also curls backwards. Downbursts can produce straight-line wind damage over an area as small as 1 mile to as large as 250 miles from the center of the downdraft. A downburst that spans a distance less than 2.5 miles in diameter is considered a micro-burst. Figure 2.36 shows wind zones in the United States. Andrew County is in Zone IV, where speeds can reach 250 mph.





Source: FEMA 320, Taking Shelter from the Storm, 3rd edition

Lightning

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt." This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit in a split second. The rapid heating and cooling of air near the lightning causes thunder. Between 75 and 100 Americans are killed each year by lightning.

The power of lightning's electrical charge and intense heat can electrocute on contact, split trees, ignite fires and cause electrical failures. Most deaths from lightning occur on the east coast, while more forest fires are started in the west as the lightning season coincides with the dry season there. Approximately 10,000 forest fires are started each year by lightning. Approximately \$100 million in annual losses result from forest and building fires caused by lightning.

It is a myth that lightning never strikes twice in the same place. In fact, lightning will strike several times in the same place in the course of one discharge. While thunderstorms and lightning can be found throughout the United States, they are most likely to occur in the central and southern states. Figure 2.37 shows lightning frequency in the state. Andrew County lies in the 6 to 8 density zone on the map.





Source: National Weather Service

Hail

Hail is another possible and common hazard that occurs in conjunction with severe thunderstorms. This form of precipitation caused by layers of ice formed in the shape of a ball or spheroid. Hail comes from cumulonimbus clouds, which may be 30,000 feet tall, with a base over 2,000 feet above the surface. The cloud has an abundance of super-cooled water that sticks to the hailstones as they pass by. The stones may drop 25,000 feet and then be picked back up by powerful updrafts. These gusts can take the growing hailstones through a cycle enough times to a point where they become extremely large and dangerous. The hail begins to fall once the stones become larger than the updrafts can keep suspended.

Historic Occurrences

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Thunderstorms and High Wind

According to the National Weather Service, Andrew County has experienced 78 thunder-

Figure 2.38

Andrew County Thunderstorm Wind Damage Events 1995-2015								
General Location	Date	Time	Туре	Magnitude	Deaths/ Injuries	Property Damage	Crop Damage	
Savannah	04/08/1995	19:30	Thunderstorm Wind	0 kts.	0	25.00K	0.00K	
Rosendale	06/07/1995	06:43	Thunderstorm Wind	52 kts.	0	2.00K	0.00K	
Fillmore	07/15/1995	17:20	Thunderstorm Wind	0 kts.	0	2.00K	0.00K	
Bolckow	07/27/1997	17:00	Thunderstorm Wind		0	25.00K	0.00K	
Fillmore	07/25/2001	00:30 Thunderstorm Wind		57 kts. E	0	10.00K	0.00K	
Savannah	03/08/2002	22:00	Thunderstorm Wind	52 kts. E	0	1.00K	0.00K	
Savannah	08/08/2007	18:56	Thunderstorm Wind	60 kts. EG	0	1.00K	0.00K	
Fillmore	06/08/2008	15:25	Thunderstorm Wind	56 kts. EG	0	5.00K	0.00K	
Amazonia	12/27/2008	02:06	Thunderstorm Wind	60 kts. EG	0	0.50K	0.00K	
Lone Corner	08/09/2010	03:30	Thunderstorm Wind	61 kts. EG	0	1.00K	0.00K	
Savannah	08/13/2010	16:35	Thunderstorm Wind	52 kts. EG	0	1.00K	0.00K	
Bolckow	05/21/2011	18:47	Thunderstorm Wind	61 kts. EG	0	1.00K	0.00K	
Savannah	06/26/2011	22:00	Thunderstorm Wind 52 kts. EG		0	1.00K	0.00K	
Savannah	06/11/2015	18:06	Thunderstorm Wind	65 kts. EG	0	50.00K	0.00K	
Bolckow 08/08/2015 23:22 Thunderstorm Wind 56 kts. EG 0 10.00K 0.00K						0.00K		
Source: NOAA National Climatic Data Center. https://www.ncdc.noaa.gov/stormevents/								

storm wind events between Jan. 1, 1950 and Dec. 31, 2015. Figure 2.38 shows the thunderstorms wind events causing damage that occurred between Jan. 1, 1995 to Dec. 31, 2015. The most severe event was on June 11, 2015 when the City of Savannah had \$50,000 in property damage from thunderstorm wind.

Lightning

Limitations to the use of National Climatic Data Center (NCDC) reported lightning events includes the fact that only lightning events that result in fatality, injury and/or property and crop damage are in the NDCD. Zero lightning events are reported in NCDC for Andrew County, although numerous non-damaging lightning events have occurred.

Hail

From Jan. 1, 1995, to October 31, 2009, Andrew County experienced 30 hail events with hail size of at least one inch. The only hail event causing property damage (\$3,000) occurred in 1995 (see Figure 2.39). There were no deaths or injuries associated with these events.

Figure 2.39

Andrew County Hail Damage Event 1995-2015								
General Location	Date	Time	Туре	Magnitude	Deaths/ Injuries	Property Damage	Crop Damage	
Andrew Co. 07/04/1995 00:55 Hail 1.75 in. 0 3.00K 0.00K								
Source: NOAA National Climatic Data Center. https://www.ncdc.noaa.gov/stormevents/								

Location

The entire area of Andrew County is at risk of severe thunderstorms, high wind, lightning and hail events.

Probable Severity and Risk

The damage from severe thunderstorms, high wind, lightning and hail is most likely to be negligible to limited, damaging mostly crops, trees and some property. However, they have the potential to cause critical damage if they strike a populated area or if the winds damage power lines, or even be deadly.

Severe Thunderstorms

There have been 54 recorded thunderstorm wind events over a 20 year period from 1995 to 2015. This equates to 2.7 thunderstorm wind occurrences in any given year with a 100% probability of occurrence. There were no events that resulted in injuries but 15 that resulted in a total of \$135,500 in property damage. This equates to .75 damaging events per year with annualized losses of \$6,775.

Lightning

There has been no recorded property damage, injury or death due to lightning according to NCDC in Andrew County. However, residents should exercise caution when lightning occurs. **Hail**

There have been 87 recorded hail events over the 20 year period from 1995 to 2015. This equates to 4.35 hail events in any given year with a 100% probability of occurrence. There was only one event that resulted in \$3,000 in property damage. This equate to one damaging event every twenty years with annualized losses of \$3,000. Figure 2.40 is a map based on hailstorm data from 1980 to 1994. It shows probability of historical occurrences (2" diameter or larger) based on number of days per year. Andrew County lies in the light green zone on the map meaning that the county will experience hail greater than 2" in diameter 1.25 to 1.50 days per year.





Source: NSSL, http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif

Adverse Impact

Thunderstorms, hail and straight-line winds may cause significant property damage, crop damage, injury and even death. Improvements in meteorological forecasting and warning systems for such storms have increased the potential for advance public preparation. These improvements, however, may or may not provide sufficient warning time depending upon the speed of storm development. The use of advanced forecasting, warning systems, vigorous public education and improved construction techniques may reduce property damage as well as the number of deaths and injuries.

Tornadoes

Tornadoes are some of the most violent, destructive storms in nature. The storms are rotating columns of air extending from a thunderstorm to the ground. Tornadoes can also occur at any time of the year, although the peak season for tornadoes in northwest Missouri is the spring and summer. Tornadoes can occur at any time of the day, but are most likely between 3 p.m. and 9 p.m. Eighty percent of all tornadoes strike between noon and midnight. The average period of a tornado's ground contact is 30 minutes, covering an average distance of 15 miles. In a review of Missouri tornadoes occurring between 1950 and 1996, the National Weather Service calculated a mean path length of 2.27 miles and a mean path area of 0.14 square miles.

Weather conditions conducive to the formation of tornadoes often produce a variety of other dangerous storm-related weather conditions, such as severe thunderstorms, downbursts, straight line winds, lightning, hail and heavy rains. A tornado is spawned by a thunderstorm and produced when cool air overtops a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado is a result of the high wind velocity and wind-blown debris.

Tornadoes are often formed from the largest thunderstorms. The most destructive tornadoes are formed by supercells, which are, according to NOAA's Storm Prediction Center, rotating thunderstorms with a well-defined radar circulation called a mesocyclone.

When a tornado threatens, individuals need to have a safe place to go and time to get there. Even with advances in meteorology, warning times may be short or non-existent. Lives are saved when individuals receive and understand the warning, know what to do and know the safest place to go.

Tornadoes are classified according to the Enhanced Fujita (EF) scale. Originally developed by Theodore Fujita in 1971, the Fujita scale ranked tornadoes according to wind speed and damage severity. In 2006, the National Weather Service released an updated version known as the Enhanced Fujita Scale after four years of collaborative research based at Texas Tech University. The new scale considers both wind speed and quality of construction in assessing each tornado after Jan. 31, 2007. The most significant differences between the original and enhanced scales lie in the consolidation of the F5 and F6 categories into a single category (EF5) without maximum wind speeds as well as the use of Damage Indicators and Degrees of Damage ranking scales to help determine wind speed estimates. It is described in Figure 2.41.

	Enhanced Fujita Tornado Damage Scale								
EF Scale	Wind	Relative							
Number	Speed	Frequency	Potential Damage						
EF0	65-85	53.5%	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e. those that remain in open fields) are always rated EF0.						
EF1	86-110	31.6%	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.						
EF2	111-135	10.7%	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light- object missiles generated; cars lifted off ground.						
EF3	136-165	3.4%	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.						
EF4	166-200	0.7%	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.						
EF5	>200	0.1%	Total destruction. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 feet; steel reinforced concrete structure badly damaged; high-rise buildings have significant structural deformation; incredible phenomena will occur.						

FEMA has found that enhancing construction minimizes property damage to homes in areas prone to hurricane force winds, and those same techniques can be just as effective in guarding against damage from moderate to severe tornadoes. Also, proper construction techniques and materials based on the most current model building codes can be used in both new construction and existing construction to reduce the damage from low to moderate intensity tornadoes.

Tornadoes can topple buildings, roll mobile homes, uproot trees, hurl people and animals through the air for hundreds of yards, and fill the air with lethal wind-born debris. Tornadoes do their destructive work through the combined action of their strong rotary winds and the impact of
wind-born debris. Contrary to popular opinion, buildings do not explode as a result of a reduced atmospheric pressure associated with a tornado. Instead, the force of the winds pushes the windward wall of the building inward. The roof is lifted and the other walls fall outward. Opening a window, once thought to minimize damage by allowing inside and outside pressure to equalize, is not effective or recommended. Research during the 1970s discovered that the pressure drop was responsible for only a small fraction of the destructive force of a tornado. All buildings have some ventilation, and it is believed this ventilation is enough to overcome the difference in most storms.

Tornadoes travel at an average speed of 30 miles per hour, but speeds ranging from 0 to 70 miles per hour have been reported, and are not uncommon. Most tornadoes move from the southwest to the northeast due to the Coriolis Effect, but the direction may be erratic and subject to sudden change.

Historic Occurrences

Andrew County has been fortunate over the years in regards to destruction

Figure 2.42

caused by tornadoes. Although tornadoes have touched down within the city limits of several cities, damage was limited, as they have hit sparsely populated areas of these cities. Because of Andrew County's location and its inherent climate, the threat of tornadoes is a reality.

The Osage Indians, native to Kansas, Oklahoma, and Missouri, passed on tornado legends to the early settlers. One such legend has it that tornadoes will not strike between two rivers, near the point where the rivers join. In the past 150 years, this idea may have given a false sense of security to some people who thereby failed to take shelter. <section-header>

The Federal Emergency Management Agency declares: "Shelters are the best means of providing near absolute protection for individuals who are attempting to take refuge during a

tornado. Whether a shelter is constructed by a homeowner for protection of his or her family or is constructed as a group or community shelter, all shelters should be designed and constructed in accordance with either FEMA 320: Taking Shelter from the Storm or The National Performance Criteria For Tornado Shelters." An example of a storm shelter is presented in Figure 2.42.

Andrew County has experienced 24 recorded tornados between Jan. 1, 1950, and Aug. 31, 2015. Combined, these tornados caused one death, 16 injuries and \$6,988,000 in property damage, according to the National Climatic Data Center (see Figure 2.43).

Figure 2.43

Andrew County Tornadoes	Da Ti	βM	De	Inj	Pro Da	Cro Da
1950-2015	te . me	ngn	ath	uri.	am	op
	× ×	itu	IS	es	age	age
		de				
$D_{\text{preimy}} = 40000 \text{NL} / 05000 \text{NL}$	07 1	E1	0	0	0.21/	0
Begin: 40°02 N / 95°00 W	07 Jun 1057	F1	0	0	0.3N	U
Longth: 0 Mile	1937					
Width: 40 Vards	10.00					
Description: None Reported						
Begin: 39°54'N / 94°42'W	20 May	F1	0	0	25K	0
End: Not Known	1959	11	Ŭ	Ŭ	2010	Ũ
Length: 0 Mile	22:00					
Width: 17 Yards						
Description: None Reported						
Begin: 39°53'N / 94°48'W	26 Sep	F1	0	3	2.5K	0
End: Not Known	1959,					
Length: 0 Mile	08:00					
Width: 10 Yards						
Description: None Reported						
Begin: 40°01'N / 94°51'W	26 Sep	F1	0	0	25K	0
End: Not Known	1959,					
Length: 0 Mile	08:07					
Width: 10 Yards						
Description: None Reported			-			_
Begin: 40°07'N / 94°52'W	10Apr	F1	0	0	25K	0
End: 40°06'N / 94°52'W	1965,					
Length: 1Mile	14:40					
Width: 1 / Yards Description: None Reported						
Description. None Reported	20 Apr	FO	0	0	2.51	0
End: Not Known	20 Apr 1061	го	0	0	2.5K	0
Length: 0 Miles	16:30					
Width: 10 Vards	10.50					
Description: None Reported						
Begin: 30°57'N / 05°00'W	31 May	FO	0	0	0K	0
Fnd: Not Known	1962	1.0	0	U U		0
Length: 0 Mile	13.45					

Width: 10 Yards						
Description: None Reported						
Begin: 39°58'N / 94°59'W	31 May	F0	0	0	0K	0
End: Not Known	1962.	-	-			-
Length: 0 Miles	13:45					
Width: 10 Yards						
Description: None Reported						
Begin: 39°57'N / 94°57'W	21 Iul	F1	0	1	25K	0
End: 39°53'N / 94°46'W	1962		Ŭ	1	2011	Ŭ
Length: 11 Miles	07.00					
Width: 100 Yards	07.00					
Description: None Reported						
Begin: 30°53'N / 94°46'W	21 Jul	F1	0	0	25K	0
End: $30^{\circ}53'$ M / $04^{\circ}45'$ W	1062	1 1	0	0	2010	0
Lind: 59 55 N / 94 45 W	1902,					
Width: unknown	07.25					
Description: None Penorted						
Description. None Reported	20 Dee	E1	0	0	251	0
End: Not Known	30 Dec	ГТ	0	0	251	0
End. Not Known Langth: 2 Miles	19/2,					
Width: 50 Vorda	01.50					
Width, 50 Falus						
Description: None Reported	12 4	ГО	0	0	01/	0
Begin: 39°58'N / 94°58'W	13 Apr	FU	0	0	UK	0
End: unknown	1981,					
Length: 2 Miles	14:42					
Width: 100 Yards						
Description: None Reported	17.1	TO	0	0	_	<u> </u>
Begin: 39°49'N / 94°51'W	17 Jun	FO	0	0	0	0
End: unknown	1985,					
Length: 0 Miles	21:56					
Width: 3 Yards						
Description: None Reported				-		
Begin: 39°55'N / 94°40'W		F1	0	0	25K	0
End: Not Known	26 Apr					
Length: 2 Miles	1991,					
Width: 50 Yards	21:15					
Description: Unknown						
Begin: 39°52'N / 94°41'W	26 Apr	F1	0	0	2.5K	0
End: Not Known	1991,					
Description: None Reported	22:57					
Begin: 40°03'N / 94°43'W	25 Jun	F2	1	2	5.M	0
End: Not Reported	1994,					
Length: 1 Mile	19:30					
Width: 100 Yards						
Description: A tornado touched down southeast of						
Whitesville destroying 12 mobile homes. A 58-year						
old woman was killed and her husband injured in one						
of the mobile homes, which had been tied down.						
Another occupant sustained minor injuries after						
fleeing the home to seek shelter in a nearby pickup						
truck. The storm also damaged a workshop and						
buildings on a nearby farm with total damage						
estimates around \$950,000. (F58M)						
Begin: 39°55'N / 94°50'W	04 Jul	F	0	0	3K	0

End: Not Known	1995,					
Length: 0 Mile	00:53					
Width: 10 Yards						
Description. Severe thunderstorms produced golf ball-						
size hail and downed trees near Cosby. Tornadoes						
touched down along Route D and over Country Club						
Village Near Sayannah a lumber vard was destroyed						
vinage. I tear bavannar a famber yard was destroyed.						
Begin: 3 Miles North West of Fillmore	08 Apr	F1	0	2	500K	250K
End: 3 Miles West North West of Bolckow	1999.		Ĩ			
Length: 8 Miles	13·30 PM					
Width: 75 Yards						
Description: The tornado touched down northwest of						
Fillmore and moved rapidly northeast, destroying six						
homes from three miles northwest of Fillmore to the						
intersection of Highways Y and H. A grain bin was						
heavily damaged and an empty semi trailer truck was						
blown into a pond. Numerous trees and power lines						
were downed along the path. Tree damage clearly						
denoted the path length and width along the track. An						
eyewitness near the intersection of Y and H highways						
witnessed the tornado formation and rushed to one of						
the damaged homes. The two minor injuries were to						
residents of two mobile homes damaged 3 miles						
northwest of Fillmore. The outbreak included at least						
five tornadoes in Missouri, one of which moved along						
a 54-mile path across three counties. Reports of						
thunderstorm wind damage were also widespread						
throughout the area.						
Begin: 3 Miles North West of Amazonia	04 May	F0	0	0	0	0
End: 3 Miles North West of Amazonia	2001,					
Length: 20 Miles	17:16					
Width: 30 Yards						
Description: Brief tornado touchdown observed by a						
trained spotter.						
Begin: 5 Miles North West of Fillmore	04 May	F0	0	0	0	0
End: 6 Miles North West of Fillmore	2001,					
Length: 25 Miles	17:48					
Width: 1 Yard						
Description: Two small tornados were observed by						
trained spotters and the general public, 5 miles						
northwest of Fillmore, moving north. No damage or						
injuries were reported.						
Begin: 2 Miles northeast of Fillmore	04 Jun	F0	0	0	0	0
End: 2 Miles northeast of Fillmore	2005					
Length: 1 Mile	16:32					
Width: 50 Yards						
Description: Brief tornado touchdown noted by storm						
chasers along US 71 near Y Highway.					-	
Begin: 4 Miles southwest of Avenue City	4 Jun 2005	FO	0	0	0	0
End: 1 Mile southwest of Avenue City Length: 3	16:53					
Miles						
Width: 50 Yards						
Description: Tornado entered Andrew county 4 miles						

southwest of Avenue City and then dissipated near						
Highway 169 1 mile southwest of Avenue City. Minor						
tree damage was reported as the tornado remained						
over rural ground.						
Begin: 5 Miles southeast of Fillmore	30 Mar,	F2	0	8	800K	0
End: 5 Miles southeast of Fillmore	2006					
Length: 5 miles	19:10					
Width: 800 Yards						
Description: Tornado touched down southeast of						
Fillmore and traveled northeast 5 miles before						
dissipating near Highway 71 and A Highway. Three						
homes were nearly or completely destroyed. About 50						
houses had some damage. Eight persons were injured.						
Begin: 4 Miles east/southeast of Fillmore	21 May,	EF0	0	0	7K	0
End: 5 Miles east/southeast of Fillmore	2011					
Length: 1.22 Miles	18:10					
Width: 60 yards						
Description: Tornado touched down east/southeast of						
Fillmore and traveled east/southeast for 1.22 miles						
before dissipating. No injuries were reported but there						
was property damage.						
Source: NOAA National Climatic Data Center Website						

Figure 2.44

<section-header>Determine Your Community's Need for High-Wind Shelters Step 1. Determine your Tornado Activity Andrew County is in the 6-10 Tornados per to 300 square miles range. Independencing to 400 square miles ra

Figure 2.44 cont'd



High Risk – Shelter is the preferred method of protection from high winds.

Step 4. Consult the local resources listed in the Points of Contact section of this document for more information on designing an appropriate shelter for your situation.

Source: http://www.tornadoproject.com/graphics/tornriskrb.gif

Figure 2.44 above shows that Andrew County is in the high risk area, with shelter as the preferred method of protection from high winds.

Location

The entire area of Andrew County is at risk for tornadoes.

Statement of Probable Severity

The level of tornado impact is generally predictable in regard to EF-scale and distance from the path of the storm. Based on the previous tornado events, the future probable severity is shown below.

EF0 - negligible

EF1 - limited EF2 - limited EF3 - critical EF4 - critical EF5 - critical

Probable Risk

Figure 2.43shows 29 tornado events over a period of 65 years (1950-2015). This calculates to an annual percentage of 37 percent or about one tornado event every three to four years. During this 65-year period, one fatality and \$6,988,000 in property damage was recorded in Andrew County. Given the value of a human life by the U.S. Federal Government's Department of Transportation is six million dollars, the average annual cost of tornado events for this period is \$199,815 (6,000,000 + 6,988,000/65 = 199,815).

Adverse Impact

The enormous power and destructive ability of tornadoes are beyond humankind's capabilities to control. Severity, risk of death or injury and property damages will continue to be high.

However, technological advances will facilitate earlier warnings than previously available. This, combined with a vigorous public education program and improved construction techniques, provides the potential for significant reductions in the number of deaths and injuries, as well as a reduction in property damage. For instance, all public schools in Andrew County have NOAA weather radios to alert administrators of potential storms. Since the last plan one school has constructed a tornado shelter and two others are in the planning process. The Boy Scout Camp, Camp Geiger, is constructing a series of tornado shelters throughout their sprawling camp ground. Weather radios are available for purchase at the Emergency Management office and Andrew County Courthouse. Warning sirens are located in the communities of Savannah, Cosby, Country Club Village and Rosendale. Some communities in Andrew County, unincorporated areas and housing developments outside of incorporated areas are still not covered by warning sirens. However, ways to secure funding for warning sirens for these communities was the most discussed mitigation topic at the planning meetings.

Wildfires

Each year, about 3,700 wildfires burn more than 55,000 acres of forest and grassland in Missouri. Most of the fires occur during the spring season, normally between February 15 and May 10. The length and severity of burning periods largely depend on the weather conditions. Spring in Missouri is noted for its low humidity and high winds. Lack of moisture increases the risk of wildfires, while drought conditions can also hamper firefighting efforts, as decreasing water supplies may not provide for adequate firefighting suppression.

Spring is when many rural residents burn their garden spots, brush piles and fields. Some landowners burn their forests in the spring to promote grass growth, kill ticks and reduce brush. The second most critical period of the year is fall. Depending on the weather conditions, a sizeable number of fires may occur between mid-October and late November.

The majority of wildfires in the world are thought to be started by people. However, the greatest cause of wild land fires is lightning. Eight million lightning strikes occur worldwide each day. One percent of these strikes result in wild land fires. In fact, dry lightning is responsible for 80 percent of all fires in wild land areas. Dry lightning occurs during thunderstorms when the humidity levels are so low that rain evaporates before it reaches the ground. Even though the rain does not reach the ground, the lightning does.

For the most part, grass, brush and forest fires are natural events that have occurred periodically throughout history. Three major classes are ground fires, surface fires and crown fires. Ground fires spread across the grass and low-lying vegetation. Surface fires burn the trunks of trees as well as the grass and low-lying vegetation. During crown fires, the flames move across the ground, up the trees, and across the tops of the trees. Crown fires are the most dangerous and destructive class of wild land fire.

The Forest Division of the Missouri Department of Conservation is responsible for protecting the privately owned and state-owned forests and grasslands from wildfires. Andrew County is in the Northwest District, which has no national forests.

Fire danger is based upon the burning index (BI). The burning index takes into account the fuel moisture, relative humidity, wind speed, temperature and recent precipitation. The burning index is the basis for fire suppression crew staffing levels.

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The Missouri Department of Conservation relies upon the local news media to help warn citizens of high fire danger. Figure 2.45 shows the set of standardized fire danger adjectives that has been developed for fire warnings. These adjectives include a brief description of burning conditions, open burning suggestions for homeowners and fire crew staffing levels. Residents should always check with their local fire department or district Forester for local

burning conditions.

Figure 2.45

Open hurning is usually safe with proper containers and	Purning Index
proper building is usually safe with proper containers and	
precautions under low file danger conditions. However,	~20
residents should always check on local ordinances that prohibit	
open burning under any conditions. Escaped fires are easy to	
extinguish. No fire crew staffing is planned for low fire danger	
conditions.	
Open burning is usually safe with the proper precautions under	Burning Index
moderate fire danger conditions. Burning should be done in the	21-30
early morning and late evening to avoid windier conditions at	
midday. Escaped fires can be contained with proper fire-	
fighting equipment. Partial fire crew staffing is planned for	
moderate fire danger	
Any open burning is discouraged during high fire danger.	Burning Index
Windy conditions, low humidity and dry fuels contribute to	31-45
high fire danger. Fires escape control easily and containment is	
difficult, endangering human safety and property. Partial or full	
fire staffing is planned, depending on local burning conditions.	
Open burning should not be attempted during extreme fire	Burning Index
danger. Local authorities may impose burning bans. High winds	>45
and extended dry periods lead to extreme burning conditions.	
Open fires can quickly escape and are very difficult to control.	
Spot fires occur ahead of the main fire, and erratic burning	
conditions make fires difficult to control even for experienced	
fire fighters. Full fire crew staffing in planned for extreme	
burning conditions.	
	Open burning is usually safe with proper containers and precautions under low fire danger conditions. However, residents should always check on local ordinances that prohibit open burning under any conditions. Escaped fires are easy to extinguish. No fire crew staffing is planned for low fire danger conditions. Open burning is usually safe with the proper precautions under moderate fire danger conditions. Burning should be done in the early morning and late evening to avoid windier conditions at midday. Escaped fires can be contained with proper fire- fighting equipment. Partial fire crew staffing is planned for moderate fire danger Any open burning is discouraged during high fire danger. Windy conditions, low humidity and dry fuels contribute to high fire danger. Fires escape control easily and containment is difficult, endangering human safety and property. Partial or full fire staffing is planned, depending on local burning conditions. Open burning should not be attempted during extreme fire danger. Local authorities may impose burning bans. High winds and extended dry periods lead to extreme burning conditions. Open fires can quickly escape and are very difficult to control. Spot fires occur ahead of the main fire, and erratic burning conditions make fires difficult to control even for experienced fire fighters. Full fire crew staffing in planned for extreme burning conditions.

Source: Missouri Department of Conservation

Rural fire departments and fire districts recommend residents in outlying or rural area, consider these additional steps:

- Create at least a 30-ft. safety zone or firebreak around your home.
- Limit the use of flammable plants in landscape design. Choose fire resistant varieties.
- Plant trees and large shrubs in sparse, separate areas.
- Limit the use of trees and shrubs that have large volumes of foliage and branches.

- Limit the use of plants that have shaggy bark or dry leaves that shed annually.
- Limit the use of plants that develop dry or dead undergrowth.
- Limit the placement of plants next to structures, under eaves, overhangs, decks, etc.
- Limit the use of plants placed at the base of trees or large shrubs.
- Remove ladder fuels (plants that provide a link between the ground and tree limbs).

Historic Occurrences

Fires covering more than 300 acres are considered large in Missouri. Missouri averages 3,700 fires a year with 55,000 acres burned, or an average fire size of 12 acres. Andrew County is largely rural with a few woodlands and has not experienced any significant wildfires. Most fires occurring in the county are those that are purposefully set to clear fields and are monitored. Figure 2.46 lists the county's wildfires from 2011-2015.

Figure	2.46	
LIGUIU		

Da Dis	Cit	Ca	Ac	Re Da	Ou Da	Da Da	Re	Ou	Co Th	Re	De De	De
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1/5/2011		1	-							_		
20:20	Fillmore	Unknown	5	0	0	0	0	0	0	0	1	0
2/2/2011	TT 1	TT 1										_
12:15	Helena	Unknown	1	0	0	0	0	0	0	0	0	0
2/19/2011	G 1	TT 1	2									
15:30	Savannah	Unknown	2	0	0	0	0	1	0	0	1	0
2/22/2011	~ .	1		-					_		_	-
13:30	Savannah	Unknown	1	0	0	0	0	0	0	0	0	0
3/6/2011			_		_		_	_	_			
1:30	Rosendale	Debris	5	0	0	0	0	0	0	0	0	0
3/12/2011												
14:30	Rea	Debris	3	0	0	0	0	0	0	0	0	0
3/12/2011												
14:50	Fillmore	Unknown	5	0	0	0	0	0	0	0	0	0
3/15/2011												
14:15	Savannah	Unknown	1	0	0	0	0	0	0	0	0	0

Date J Disco	City	Cause	Acres	Kesio Dama	Outbu Dama	Comn Dama	Resid Threa	Outbu Threa	Comn Threa	Resid Destr	Outbu Destro	Comn Destre
Fire vered			Burnt	aged	uildings 1.ged	nercial ged	ences itened	uildings Itened	nercial itened	ences oyed	uildings oyed	nercial oyed
3/16/2011	Amazonia	Unknown	2	0	0	0	1	0	0	0	0	0
2/16/2011	Amazoma	UIIKIIOWII	2	0	0	0		0	0	0	0	0
19:00	Whitesville	Unknown	80	0	0	0	0	0	0	0	0	0
3/17/2011												
15:00	Fillmore	Unknown	5	0	0	0	0	0	0	0	0	0
3/18/2011	Savannah	Miscellaneous	35	0	0	0	0	0	0	0	0	0
3/18/2011	Suvumun	miseenuneous				-				Ű		
21:15	Rosendale	Debris	2	0	0	0	0	0	0	0	0	0
3/19/2011												
15:00	Rosendale	Debris	15	0	0	0	0	0	0	0	0	0
3/20/2011	G 1		10		0						0	
14:00	Savannah	Miscellaneous	10	0	0	0	0	0	0	0	0	0
20:30	Amazonia	Unknown	30	0	0	0	0	0	0	0	0	0
3/24/2011	Avenue											
14:40	City	Miscellaneous	1	0	0	0	0	0	0	0	0	0
3/27/2011	TTTT	D 1 '										
20:45	Whitesville	Debris	80	0	0	0	0	0	0	0	0	0
19.50	Fillmore	Unknown	5	0	0	0	0	0	0	0	0	0
4/2/2011	Timilore					Ŭ	Ŭ			Ŭ	Ŭ	
12:10	Savannah	Miscellaneous	2	0	0	0	0	0	0	0	0	0
4/3/2011												
0:00	Savannah	Unknown	5	0	0	0	1	0	0	0	1	0
4/3/2011	Fillmoro	Dobrig	E	0	1	0	2	1	0	0	0	0
4/3/2011	Filimore	Debris	5	0		0	2	1	0	0	0	0
0:00	Fillmore	Unknown	5	0	0	0	0	0	0	0	0	0
4/3/2011												
11:00	Savannah	Miscellaneous	25	0	0	0	0	0	0	0	0	0
4/5/2011	Country		_	_				_		_		_
10:39	Club	Miscellaneous	8	0	0	0	0	0	0	0	0	0
4/3/2011 14·50	Savannah	Miscellaneous	2	0	0	0	0	n	0	0	0	0
14.30	Savailliall	winscentaneous	Ζ	U	0	0	0	0	U	U	0	0

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4/6/2011 Avenue		
12:53 City Debris 1 0 0 0 1 1 0 0	0	0
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$\frac{12.01}{4/12/2011}$ Amazonia Wiscenancous 1 0 0 0 0 0 0 0 0	0	0
13:24 Savannah Miscellaneous 2 0 0 0 0 0 0 0	0	0
5/2/2011		
14:23 Savannah Miscellaneous 2 0 <td>0</td> <td>0</td>	0	0
6/7/2011		
19:45 Rosendale Debris 10 0	0	0
7/14/2011	_	_
9:45 Rosendale Unknown 0.1 1 0 0 0 0 0 0	0	0
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0/1/2011 21.45 Rosendale Miscellaneous 0.1 0 0 0 1 0	0	0
8/26/2011	0	0
0.201 = 0.201 = 0.000 Savannah Unknown 5 0 0 0 1 0 0 0	1	0
9/4/2011		
0:00 Bolckow Unknown 5 0 0 0 1 1 0 0	1	0
9/28/2011		
0:00 Fillmore Unknown 45 0 0 0 1 1 0 0	0	0
10/3/2011 Country	0	
13.43 Club Unknown 1 0 0 0 0 0 0 0	0	0
9.40 Savannah Unknown 3 0 0 0 0 0 0	0	0
10/5/2011		0
22:20 Rea Debris 5 0 0 0 0 0 0	0	0
10/9/2011		
0:00 Fillmore Unknown 45 0 0 0 0 0 0 0 0	0	0
10/15/2011	_	_
14:30 Savannah Unknown 1 0 0 0 0 0 0 0	0	0
10/15/2011 16:00 Ameronia Unimerum 1 0 0 0 0 0 0 0	0	0
10/21/2011	U	U
10/21/2011 14:25 Amazonia Unknown 3 0 0 0 0 0 0 0	0	0

Date F Discov	City	Cause	Acres	Keside Dama	Outbu Dama;	Comm Dama	Reside Threa	Outbu Threa	Comm Threa	Reside Destro	Outbu Destro	Comm Destro
'ire 'ered			Burnt	ged	iildings ged	iercial ged	ences tened	ildings tened	tened	ences byed	iildings yed	iercial oyed
10/23/2011 14:55	Savannah	Unknown	1	0	0	0	0	0	0	0	0	0
10/25/2011 0:00	Fillmore	Unknown	45	0	0	0	0	0	0	0	0	0
10/25/2011 0:00	Fillmore	Unknown	100	0	0	0	0	0	0	0	0	0
10/25/2011 14:10	Fillmore	Equipment	40	0	0	0	0	0	0	0	0	0
10/2//2011 0:00	Fillmore	Unknown	45	0	0	0	0	0	0	0	0	0
0:00	Fillmore	Unknown	5	0	0	0	1	0	0	0	0	0
10/29/2011 12:40	Savannah	Unknown	2	0	0	0	0	0	0	0	0	0
<u>16:05</u> 10/29/2011	Amazonia	Unknown	1	0	0	0	0	0	0	0	0	0
18:45	Rea	Unknown	1	0	0	0	0	0	0	0	0	0
11/16/2011 15:05	Savannah	Unknown	1	0	0	0	0	0	0	0	0	0
11/19/2011 14:30	Rosendale	Miscellaneous	20	0	0	0	0	0	0	0	0	0
20:45	Amazonia	Unknown	2	0	0	0	0	0	0	0	0	0
14:30 12/29/2011	Helena	Miscellaneous	2	0	0	0	0	0	0	0	0	0
<u>11:20</u> 1/1/2012	Cosby Country	Miscellaneous	2	0	0	0	0	0	0	0	0	0
15:30 1/4/2012	Club	Unknown	3	0	0	0	0	0	0	0	0	0
17:00 1/5/2012	Rosendale	Unknown	1	0	0	0	0	0	0	0	0	0
16:35 1/6/2012	Savannah	Miscellaneous	1	0	0	0	0	0	0	0	0	0
10:30 1/6/2012	Cosby	Miscellaneous	2	0	0	0	0	0	0	0	0	0
14:30	Helena	Miscellaneous	2	0	0	0	0	0	0	0	0	0

Date Fi Discove	City	Cause	Acres H	Kesidei Damag	Outbui Damag	Commo Damag	Resider Threat	Outbui Threat	Commo Threat	Resider Destroy	Outbui Destroy	Commo Destroy
bred			Burnt	aces	ldings ed	ercial ed	nces ened	ldings ened	ercial ened	nces yed	ldings yed	ercial yed
1/6/2012	Rosendale	Miscellaneous	5	0	0	0	0	0	0	0	0	0
1/14/2012						-			-			
15:00	Whitesville	Miscellaneous	20	1	0	0	1	0	0	0	0	0
1/15/2012												
13:45	Rosendale	Debris	45	0	1	0	0	0	0	0	0	0
1/16/2012	Avenue					_						
11:30	City	Debris	30	0	0	0	0	0	0	0	0	0
1/21/2012	Savannah	Dahria	1	0	0	0	0	0	0	0	0	0
1/20/2012	Avenue	Debris	1	0	0	0	0	0	0	0	0	0
1/29/2012	City	Miscellaneous	1	0	0	0	0	0	0	0	0	0
1/29/2012	City	willseenaneous				Ŭ		0		0		
17:10	Rosendale	Unknown	3	0	0	0	0	0	0	0	0	0
1/29/2012												
17:25	Helena	Miscellaneous	1	0	0	0	0	0	0	0	1	0
2/1/2012												
16:40	Savannah	Miscellaneous	1	0	0	0	0	0	0	0	0	0
2/2/2012	G 1											
16:00	Savannah	Miscellaneous	4	0	0	0	0	0	0	0	0	0
2/12/2012	Rosendale	Miscellaneous	15	0	0	0	0	0	0	0	0	0
2/20/2012	Rosendare	winseemaneous	15	0	0	0	0	0	0	0	0	0
1:15	Rosendale	Debris	10	0	0	0	0	0	0	0	0	0
2/22/2012												
12:15	Rosendale	Unknown	4	0	0	0	0	0	0	0	0	0
2/26/2012	Country											
16:25	Club	Unknown	2	0	0	0	0	0	0	0	0	0
2/27/2012	G 1			0		0			0			
2/5/2012	Savannah	Miscellaneous	1	0	0	0	0	0	0	0	0	0
3/5/2012	Posendala	Debric	5	0	0	0	0	0	0	0	0	0
3/5/2012	Rusenuale			0			0	0		0		
12:34	Helena	Miscellaneous	2	0	0	0	0	0	0	0	0	0
3/8/2012												<u> </u>
19:15	Rosendale	Unknown	1	0	0	0	0	0	0	0	0	0
3/12/2012	Country											
13:20	Club	Unknown	6	0	0	0	0	0	0	0	0	0

Date Disc	City	Caus	Acre	Dam	Dam	Dam	Resid	Outb Thre	Com Thre	Resid Dest	Outb Dest	Com Desti
Fire overe		ě	s Bur	aged	aged	aged	dence	atene	merc	dence royed	ouildi royed	merc royed
d			nt	Ű.	ngs	141	b D D	ngs bd	ial 2d	Ø	ngs	ial
3/13/2012												
17:00	Whitesville	Unknown	20	0	0	0	0 0	0	0	0	0	0
3/16/2012	Amozonia	Miscellaneous	2	0	0			0	0	0	0	0
3/17/2012	Amazoma	winscentaneous	۷.	0	0			0	0	0	0	0
15:15	Savannah	Miscellaneous	3	0	0	C	0 0	0	0	0	0	0
3/17/2012												
15:15	Savannah	Debris	10	0	0	0	0 0	0	0	0	0	0
3/18/2012												
17:15	Savannah	Miscellaneous	1	0	0	C	0 0	0	0	0	0	0
3/21/2012												
20:30	Rosendale	Equipment	1	0	0	0	0 0	0	0	1	0	0
3/28/2012		D 1 ·									0	
19:02	Cosby	Debris	1	0	0	(0 0	0	0	0	0	0
4/26/2012	Sayannah	Missellaneous	1	0				0	0	0	0	0
5/11/2012	Savailliall	winscentaneous	T	0				0	0	0	0	0
15:32	Helena	Miscellaneous	1	0	0	0	0 0	0	0	0	0	0
6/9/2012							_	_	_	-		
13:15	Amazonia	Miscellaneous	2	0	0	0	0 0	0	0	0	0	0
7/14/2012												
16:00	Rosendale	Unknown	1	0	0	C	0 0	0	0	0	0	0
7/16/2012												
15:50	Rosendale	Unknown	1	0	0	0	0 0	0	0	0	0	0
7/20/2012		F · · · ·	4	_				0		0	0	
16:30	Cosby	Equipment	1	0	0			0	0	0	0	0
15:45	Coshy	Miscellaneous	0.1	0	0			0	0	0	0	0
8/3/2012	COSOY	winseemaneous	0.1	0				0	0		0	0
15:45	Amazonia	Unknown	1	0	0	0	0 0	0	0	0	0	0
8/11/2012	Country						_	_	_	-		
15:55	Club	Unknown	1	0	0	C	0 0	0	0	0	0	0
8/15/2012												
21:30	Rosendale	Equipment	1	0	0	C	0 0	0	0	0	0	0
8/18/2012												
10:01	Savannah	Unknown	2	0	0	0	0 0	0	0	0	0	0
8/19/2012												
13:05	Helena	Unknown	1	0	0	0	0 0	0	0	0	0	0

Dat Dis	Cit	Cau	Acı	Dai	Rec	Ou	Coi Dai	Res Thi	Ou Thi	Coi Thi	Res Des	Ou Des	Coi Des
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ed			ırnt	1 65		lings	cial 1	ied	lings 1ed	cial 1ed	d d	lings d	d
8/22/2012													
17:31	Savannah	Smoking	0.5	0)	0	0	0	0	0	0	0	0
8/25/2012	Corrownah	Migaallanaana	1	0		0	0	0	0	0	0	0	0
8/28/2012	Savannan	Miscenaneous	L	0	,	0	0	0	0	0	0	0	0
17.15	Savannah	Miscellaneous	4	0)	0	0	0	0	0	0	0	0
9/1/2012	Suvainan	willseenaneous		0	<u> </u>	0		U		Ū		Ŭ	
17:45	Rosendale	Miscellaneous	1	0)	0	0	0	0	0	0	0	0
9/1/2012													
22:30	Rosendale	Debris	1	0)	0	0	0	0	0	0	0	0
9/14/2012													
14:15	Helena	Not Reported	1	0)	0	0	0	0	0	0	0	0
9/30/2012	Country	NC 11	4 5			2	_	0	2	0		1	
12:42	Club	Miscellaneous	1.5	0)	2	0	0	2	0	0	1	0
10/11/2012	Rosendale	Unknown	1	0	,	1	0	0	0	0	1	0	0
19.20	Rosendare	Ulikilowii		0	, 	-	0	0	0	0	- 1	0	
15:30	Cosby	Smoking	1	0)	0	0	0	0	0	0	0	0
1/26/2013													
21:00	Rosendale	Unknown	1	0)	0	0	0	0	0	0	0	0
2/10/2013													
16:42	Savannah	Miscellaneous	2	0)	0	0	0	0	0	0	0	0
3/29/2013													
20:37	Cosby	Miscellaneous	1	0)	0	0	1	1	0	0	0	0
4/5/2013	XX71 · 4 · 11	NC 11	20			0	0		0	0	0	0	
1/:00	whitesville	Miscellaneous	20	0	,	0	0	0	0	0	0	0	0
4/0/2013	Whitesville	Miscellaneous	10	0	,	0	0	0	0	0	0	0	0
4/16/2013	wintesvine	wijseenaneous	10	0	<u> </u>	0	0		0	0	Ū	0	
13:10	Savannah	Unknown	1	0)	0	0	0	0	0	0	0	0
4/16/2013													
15:05	Savannah	Unknown	1	0)	0	0	0	0	0	0	0	0
4/16/2013													
15:57	Savannah	Unknown	1	0)	0	0	0	0	0	0	0	0
5/13/2013				-		_	_	_	_	_	_	_	
14:50	Rosendale	Unknown	1	0)	0	0	0	0	0	0	0	1
11/29/2013	Cashe	Eminuent	-	_		~		_	_	_	_		
14:00	Cosby	Equipment	5	0	1	U	U	0	U	0	0	0	U

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ire ered			Bur	nces	ildir <u>ged</u>	erci	nces	ildir Ceneo	erci ene	nces yed	ildin <u>yed</u>	erci yed
			nt	•	SBI	al		d Sgi	d al	•	SBI	al
1/20/2014												
21:45	Fillmore	Unknown	0.5	0	0	0	0	0	0	0	0	0
1/24/2014	Country											
15:06	Club	Miscellaneous	1	0	0	0	0	0	0	0	0	0
1/25/2014	Avenue											
8:40	City	Miscellaneous	2	0	0	0	0	0	0	0	0	0
1/25/2014	~ 1	_ ·										
8:43	Cosby	Equipment	2	0	0	0	0	0	0	0	0	0
1/26/2014	G 1	NC 11	-		0		0			0		0
1/26/2014	Cosby	Miscellaneous	5	0	0	0	0	0	0	0	0	0
1/20/2014	Posondala	Unknown	26	0	0	0	0	0	0	0	0	0
1/26/2014	Koselidale	Ulikilowii	20	0	0	0	0	0	0	0	0	0
1720/2014	Amazonia	Miscellaneous	1	0	0	0	0	0	0	0	0	0
1/26/2014	7 mazoma	winseemaneous	1	0				Ŭ		0		0
18:00	Savannah	Miscellaneous	1	0	0	0	0	0	0	0	0	0
1/26/2014	Suvuillull	THISCOLLAG			-							-
18:08	Cosby	Miscellaneous	3	0	0	0	0	0	0	0	0	0
1/26/2014												
20:40	Fillmore	Unknown	2	0	0	0	0	0	0	0	0	0
1/26/2014												
22:00	Fillmore	Unknown	30	0	0	0	0	0	0	0	0	0
1/26/2014												
22:30	Fillmore	Miscellaneous	60	0	0	0	0	0	0	0	0	0
1/26/2014												
22:45	Fillmore	Unknown	0.5	0	0	0	0	0	0	0	0	0
1/29/2014	T .11	TT 1	0		0		0			0		0
15:00	Fillmore	Unknown	8	0	0	0	0	0	0	0	0	0
2/24/2014	Sayannah	Unknown	2	0	0	0	0	0	0	0	0	0
2/10/2014	Savailliall	Ulikilowii	5	0	0	0	0	0	0	0	0	0
11.2014	Savannah	Miscellaneous	2	0	0	0	n	n	0	n	0	0
3/10/2014	Savaillall	miscenancous	5									
12.25	Savannah	Miscellaneous	1	0	0	0	0	0	0	0	0	0
3/10/2014	Swithinin					+			t		Ť	
14:50	Savannah	Miscellaneous	1	0	0	0	0	0	0	0	0	0
3/10/2014												
16:20	Savannah	Miscellaneous	3	0	1	0	0	0	0	0	0	0

Date Disc	City	Cau	Acr	Dan	Dan	Out	Con Dan	Resi Thr	Out Thr	Con Thr	Resi Dest	Out Dest	Con Dest
e Fire overe		se	es Bui	naged	naged	buildi	nmerc	idence eatenc	buildi eaten	nmerc eatene	idence troyed	buildi t <u>roye</u> d	nmerc troyed
d			nt	Ŭ	6	ngs	ial	ed	ngs ed	ial ed	- 3	ngs I	ial I
3/12/2014	Country					_	_						
17:09	Club	Unknown	1	0		0	0	0	0	0	0	0	0
3/15/2014	Amazonia	Miscellaneous	2	0		Λ	0	0	0	0	0	0	0
3/15/2014	Amazoma	wiscenaneous	5	0		0	0	0	0	0	0	0	0
13:15	Savannah	Miscellaneous	8	0		0	0	0	0	0	0	0	0
3/15/2014													
15:32	Cosby	Debris	10	0		0	0	0	4	0	0	2	0
3/15/2014													
16:00	Rosendale	Miscellaneous	12	0		0	0	0	0	0	0	1	0
3/15/2014	Corrownah	Migaallanaana	0	0		0	0	0	0	0	0	0	0
2/15/2014	Savannan	Miscellaneous	8	0		0	0	0	0	0	0	0	0
16:45	Savannah	Miscellaneous	8	0		0	0	0	0	0	0	0	0
3/15/2014													
18:10	Amazonia	Miscellaneous	2	0		0	0	0	0	0	0	0	0
3/15/2014													
19:45	Amazonia	Miscellaneous	1	0		0	0	0	0	0	0	0	0
3/21/2014													
16:48	Fillmore	Unknown	2.5	0		0	0	0	0	0	0	0	0
3/21/2014	Fillmore	Unimoven	G	0		0	0	0	0	0	0	0	0
3/22/2014	Filimore	Unknown	0	0		0	0	0	0	0	0	0	0
13.30	Savannah	Miscellaneous	1	0		0	0	0	0	0	0	0	0
3/23/2014						-	-		-		-		
14:20	Savannah	Miscellaneous	8	0		0	0	0	0	0	0	0	0
3/30/2014													
13:40	Fillmore	Unknown	0.5	0		0	0	0	0	0	0	0	0
3/31/2014	F :11	T.T., 1	1 5			0	0	0	0		0		
2/21/2014	Filimore	Unknown	1.5	0		0	0	0	0	0	0	0	0
20.00	Fillmore	Unknown	3	0		0	0	0	0	0	0	0	0
4/1/2014	Timilore					Ŭ			Ŭ			-	
14:24	Amazonia	Miscellaneous	3	0		0	0	0	0	0	0	0	0
4/5/2014													
14:40	Savannah	Miscellaneous	1	0		0	0	0	0	0	0	0	0
4/11/2014	5.11			-		~	_	_	-	_	-	_	_
13:48	Fillmore	Unknown	2.5	0		0	0	0	0	0	0	0	0

Dat Dise	Citį	Cau	Acr	kes Dar	Dar	01	Cor Dar	Res Thr	Out Thr	Cor Thr	Res Des	Des	Des	Cor
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4/11/2014 16:30	Fillmore	Unknown	1	0	(C	0	0	0	0	0	0		0
4/11/2014 18:40	Savannah	Miscellaneous	7	0	(C	0	0	0	0	0	0		0
4/12/2014 11:46	Fillmore	Unknown	68	0	(C	0	0	0	0	0	0		0
4/12/2014 13:30	Fillmore	Unknown	17	0		C	0	0	0	0	0	0		0
4/12/2014 14:00	Fillmore	Miscellaneous	100	0	(C	0	0	0	0	0	0		0
4/12/2014 14:15	Amazonia	Miscellaneous	250	0	(С	0	1	2	0	0	0		0
18:33 5/7/2014	Savannah	Unknown	1	0	(C	0	0	0	0	0	0		0
17:10 10/17/2014	Fillmore	Unknown	2	0	(C	0	0	0	0	0	0	-	0
14:45 11/18/2014	Helena	Not Reported	2	0	(C	0	0	0	0	0	0		0
13:45 11/29/2014	Cosby	Unknown	1	0	(C	0	0	0	0	0	0		0
18:00 1/12/2015	Cosby	Miscellaneous	1	0	(C	0	0	0	0	0	0		0
12:10 1/16/2015	Helena	Unknown	2	0)	0	0	0	0	0	0		0
14:00 1/19/2015 12:20	Fillmore	Missellencous	15	0		5	0	0	0	0	0			0
1/28/2015	Helena	Miscellaneous	2	0))	0	0	0	0	0	0		0
3/7/2015	Savannah	Miscellaneous	2	0		о С	0	0	0	0	0	0		0
3/7/2015 12:35	Savannah	Miscellaneous	2	0		b	0	0	0	0	0	0		0
3/7/2015 13:15	Savannah	Miscellaneous	3	0	(C	0	0	0	0	0	0		0
3/7/2015 15:10	Country Club	Miscellaneous	3	0		2	0	0	0	0	0	0		0

Datı Disc	City	Cau	Acr	nes Dan	Dan	Dan	Con	Resi Thr	Out Thr	Con Thr	Resi Dest	Out Desi	Con Desi
e Fire over	7	se	es Bu	naged	naged	naged	nmer	idenc eaten	build eaten	nmer eaten	idenc troye	build troye	nmer troye
č,			rnt	es l			cial	es ed	ings ed	cial ed	d	ings d	cial d
3/7/2015													
15:20	Savannah	Miscellaneous	1	0	0		0	0	0	0	0	0	0
3/8/2015											_		
14:00	Cosby	Unknown	2	0	C		0	1	0	0	0	0	0
3/9/2015	Country	Miscellaneous	2	0	0		0	0	0	0	0	0	0
3/10/2015	Club	wiscentaneous	2	0			0	0	0	0	0	0	0
12:30	Savannah	Miscellaneous	2	0	0		0	0	0	0	0	0	0
3/10/2015													
14:50	Savannah	Miscellaneous	1	0	0		0	0	0	0	0	0	0
3/10/2015	Fillmoro	Unknown	15	0			0	0	0	0	0	0	0
3/10/2015	Filmole	UIIKIIOWII	13	0			0	0	0	0	0	0	0
15:10	Fillmore	Unknown	35	0	0		0	0	0	0	0	0	0
3/10/2015													
15:40	Cosby	Unknown	1	0	0		0	1	0	0	0	0	0
3/11/2015	G 1	NC 11	1				~	0	0			0	0
3/12/2015	Savannah	Miscellaneous	1	0			0	0	0	0	0	0	0
4.50	Fillmore	Unknown	35	0	0		0	0	0	0	0	0	0
3/12/2015	1 11111010						•						
16:40	Savannah	Miscellaneous	4	0	0		0	0	0	0	0	0	0
3/12/2015								_					
17:35	Savannah	Miscellaneous	2	0	0		0	0	0	0	0	0	0
3/14/2013	Fillmore	Unknown	25	0	0		0	0	0	0	0	0	0
3/14/2015							•						
13:50	Rosendale	Unknown	120	0	0		0	0	0	0	0	0	0
3/15/2015			_								_		
11:10	Amazonia	Miscellaneous	5	0	C		0	0	0	0	0	0	0
3/16/2015	A	Missell	1				~	_					
15:45 3/16/2015	Amazonia	Iviiscenaneous		0			U	U	0	0		0	0
15:50	Fillmore	Unknown	2	0	0		0	0	0	0	0	0	0
3/16/2015					1					1	1	1	
17:00	Fillmore	Unknown	15	0	0		0	1	0	0	0	0	0
3/16/2015	D .11	TT 1	20				_	_		_			
18:11	Fillmore	Unknown	30	0	0		U	0	0	0	0	0	0

Date Fire Discovered	City	Cause	Acres Burnt	Residences Damaged	Outbuildings Damaged	Commercial Damaged	Residences Threatened	Outbuildings Threatened	Commercial Threatened	Residence Destroyed	Outbuildings Destroyed	Commercial Destroyed
3/20/2015												
15:40	Savannah	Miscellaneous	6	0	0	0	0	0	0	0	0	0
3/21/2015			_		_			_		_	_	_
13:50	Amazonia	Miscellaneous	3	0	0	0	0	0	0	0	0	0
3/28/2015												
16:30	Cosby	Miscellaneous	20	0	0	0	0	0	0	0	0	0
3/29/2015			_			_			_		-	-
19:50	Fillmore	Unknown	5	0	0	0	0	0	0	0	0	0
3/31/2015	Country					_			_		-	-
14:34	Club	Miscellaneous	10	0	0	0	0	0	0	0	0	0
3/31/2015	Country				_			_		_	_	_
15:45	Club	Miscellaneous	20	0	0	0	0	0	0	0	0	0
4/1/2015												
22:50	Fillmore	Unknown	1	0	0	0	0	0	0	0	0	0
7/4/2015												
7:00	Fillmore	Unknown	0.25	0	0	0	0	0	0	0	0	0
10/10/2015												
13:46	Cosby	Unknown	1	0	0	0	0	0	0	0	0	0
		Total:	2,103.65	1	6	0	18	19	0	3	10	1

Source: Missouri Department of Conservation, 2015

Location

Rural areas of Andrew County are most at risk of wildfire. A map is included in Appendix B that shows the grassland and crop areas of the county.

Probable Severity

Any fire event in the county is likely to be contained to rural grassland areas, which would cause negligible damage.

Probable Risk

Based on the last five years of fire reporting statistics from the MDC in Figure 2.46, there were a total of 184 reported wildfires from 2011 to 2015. This equates to an average of wildfire 36.8 events annually and a 100% probability of occurrence in any given year.

Adverse Impact

Wildfire would most impact landowners, agriculture production and destroy some structures.

Section 3: Vulnerability Assessment

A vulnerability assessment provides policy makers, emergency managers and planners with information on the extent of loss of life, injuries and property damage that may result from a hazard event of a given intensity for an area. The vulnerability assessment includes an inventory of assets and estimation of potential losses. This measure attempts to combine information related to hazard identification with an inventory of commercial property, residential property, public facilities and infrastructure. Examining data from historical occurrences, including disaster declarations, is important in a vulnerability assessment.

Disaster Declaration History

The federal government will issue disaster declarations when the capabilities of the local government to respond and recover are surpassed by the severity and magnitude of an event. The initial step in the declaration process involves the state issuing a disaster declaration that allows for the provision of assistance to the local governments from the state government. If the severity of the disaster is great enough that the local and state governments cannot respond to the situation through their own capacity, a federal emergency or disaster may be declared. This allows assistance from the federal government to be provided to local jurisdictions.

The Stafford Act provides for two types of disaster declarations: emergency declarations and major disaster declarations. The emergency declarations authorize the President to provide supplemental assistance to disaster response. A major disaster declaration provides for a wide range of federal assistance programs for individuals and public infrastructure for both emergency and permanent repairs.

Two types of assistance exist in response to these declarations. Public assistance provides assistance to states, tribes and local governments. Debris removal, emergency protective measures, roads and bridges, water control facilities, buildings and equipment, utilities, and park and recreation facilities are tackled through the use of public assistance. Individual assistance differs from public assistance in that it includes assistance to households or individuals with respect to crisis counseling, case management, legal services, unemployment assistance, and supplemental nutrition services.

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Emergency declarations are also issued by FEMA. These declarations are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. The scale, types of damage, and industrial sectors involved determine the declaration type.

Figure 3.1 lists all federal disaster declarations issued for Andrew County between the years 1990-2016. The table lists the disaster number, a description of events taking place, the date of declaration, the period of the incident, and the amounts of Individual Assistance (IA) and Public Assistance (PA).

Figure 3.1

Disaster Number	Description	Declaration Date/ Incident Period	Individual Assistance (IA) Public Assistance (PA)
DR-1054	Severe storms, tornadoes, hail, flooding	6/2/1995 05/13/1995-06/23/1995	Unknown
DR-1253	Severe storms and flooding	10/14/1998 10/04/1998-10/11/1998	IA: \$0 PA: \$12,908,455.45
DR-1270	Severe storms and flooding	04/20/1999 04/03/1999-04/14/1999	Unknown
DR-1524	Severe storms, tornadoes, flooding	06/11/2004 05/18/2004-05/31/2004	IA: \$1,396,915.31 PA: \$0
DR-1635	Severe storms, tornadoes, flooding	04/05/2006 03/30/2006-04/03/2006	IA: \$2,611,696.48 PA: \$16,319,372.80
DR-1708	Severe storms and flooding	06/11/2007 05/05/2007-05/18/2007	IA: \$2,428,002.26 PA: \$7,642,999.09
DR-1736	Severe winter storms	12/27/2007 12/06/2007-12/15/2007	IA: \$0 PA: \$24,948,123.75
DR-1773	Severe storms and flooding	06/25/2008 06/01/2008-08/13/2008	IA: \$5,367,078.69 PA: \$28,697,245.28
DR-1934	Severe storms, flooding, tornadoes	08/17/2010 06/12/2010-07/31/2010	IA: \$0 PA: \$17,450,778.18
DR-1961	Severe winter storm and snowstorm	03/23/2011 01/31/2011-02/05/2011	IA: \$0 PA: \$9,807,841.20
DR-4012	Flooding	08/12/2011 06/01/2011-08/01/2011	IA: \$3,145,110.51 PA: \$21,748,074.72
DR-4200	Severe storms, tornadoes, straight-line winds, flooding	10/31/2014 09/09/2014-09/11/2014	IA: \$0 PA: \$6,131,174.56
DR-4238	Severe storms, tornadoes, straight-line winds, flooding	08/07/2015 05/15/2015-07/27/2015	IA: \$0 PA: \$49,321,931.21

Source: Federal Emergency Management Agency http://www.fema.gov/disasters

Vulnerability describes an asset's level of exposure or susceptibility to damage from natural hazards. For assets such as homes and commercial property, critical facilities or infrastructure, the vulnerability is determined by a number of factors, including construction, contents and economic value. Assessments include estimates of potential injuries, property damage and economic losses from natural hazards within Andrew County. This includes estimates of the number of people, buildings and infrastructure potentially at risk from a hazard, as well as the approximate dollar value of those structures. The building stock exposure is for all types of property: residential, commercial, industrial, agriculture, religious, government and education.

Overall risk for Andrew County was calculated by averaging probability with severity. Numeric values were assigned Low = 1, Medium = 2, High = 3 for calculation.

For example, if a disaster has a high probability of occurring (high = 3) with a low level of severity (low = 1), the overall risk (3 + 1/2 = 2) would be medium. The planning committee determined it was best to overestimate risk rather than underestimate it, so all fractions were rounded up to the next whole number. The planning committee kept the same set of probabilities from the 2011 plan, citing that weather patterns have not changed in the county and the probabilities seemed accurate.

The probability of each hazard as identified in Section 2 is rated on the following scale:

Low: The hazard has little or no chance of happening. Less than five percent chance of occurrence in any given year. Unlikely.

Medium: The hazard has a reasonable probably of occurring, i.e., from five to ten percent chance of occurrence in any given year. Possible.

High: The probability is from over10 percent and to a 100 percent chance of occurrence in any given year. Likely.

Severity was determined by assessing the potential number of deaths, injuries and amount of damage that could result from the hazard. When calculating severity, jurisdictions took into account the likely locations for each hazard, then they were ranked as low, medium or high. These categories were outlined in Section 2 and are repeated here.

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Low: Injuries and/or illness are treatable with first aid. Minimal quality of life impact. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property is severely damaged. Negligible.

Medium: Injuries and/or illness do not result in permanent disability. Complete shutdown of critical facilities for more than one day and less than 25 percent of property is damaged. Limited.

High: Deaths and major injuries occur. Complete shutdown of critical facilities for several days. More than 25 percent of property is damaged. Critical.

In the thunderstorm example in Figure 3.2, the first "M" indicates a medium severity ranking; the second "H" indicates a high probability which results in a third "H" or high overall vulnerability. Figure 3.3 shows the overall vulnerability assessment for Andrew County and its jurisdictions. The three values listed in each cell correspond to the ranked values for severity, probability and the resulting overall vulnerability.

Figure	3.2	
– – – –		

VULNERABILITY							
ASSESSMENT							
	HAZARD						
Jurisdiction	Thunderstorm						
Andrew County	M,H=H						

Figure 3.3

Vulnerability Assessment										
]	Hazard					
Jurisdiction	Dam	Drought	Earth-	Flood	Heat	Land	Thunder	Severe	Tornado	Wildfire
	Failure	_	quake		Wave	Sub-	-storm	Winter		
						sidence		Weather		
Andrew	L, L =	M, M =	L, L =	M, M =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
County	Low	Medium	Low	Medium	Medium	Low	High	High	High	Low
Amazonia	L, L =	M, M =	L, L =	H, H =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
	Low	Medium	Low	High	Medium	Low	High	High	High	Low
Bolckow	L, L =	M, M =	L, L =	M, M =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
	Low	Medium	Low	Medium	Medium	Low	High	High	High	Low
Cosby	L, L =	M, M =	L, L =	L, L =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
	Low	Medium	Low	Low	Medium	Low	High	High	High	Low
Country	L, L =	M, M =	L, L =	L, L =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
Club	Low	Medium	Low	Low	Medium	Low	High	High	High	Low
Fillmore	L, L =	M, M =	L, L =	L, L =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
	Low	Medium	Low	Low	Medium	Low	High	High	High	Low
Rea	L, L =	M, M =	L, L =	L, L =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
	Low	Medium	Low	Low	Medium	Low	High	High	High	Low
Rosendale	L, L =	M, M =	L, L =	H, H =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
	Low	Medium	Low	High	Medium	Low	High	High	High	Low
Savannah	L, L =	M, M =	L, L =	L, L =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
	Low	Medium	Low	Medium	Medium	Low	High	High	High	Low
Avenue	L, L =	L, L =	L, L =	L, L =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
City	Low	Low	Low	Low	Medium	Low	High	High	High	Low
School										
North	L, L =	L, L =	L, L =	L, L =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
Andrew	Low	Low	Low	Low	Medium	Low	High	High	High	Low
School										
Savannah	L, L =	L, L =	L, L =	L, L =	H, L =	L, L =	H, M =	H, M =	H, H =	L, L =
School	Low	Low	Low	Low	Medium	Low	High	High	High	Low

Structures and Critical Facilities

Figure 3.4 lists the total building count and valuations for seven categories of building stock. This information is taken from FEMA's Hazards United States–Multi-Hazards (HAZUS-MH) runs conducted by SEMA.

HAZUS data is not an exact count of buildings, but an estimate. It is, however, the most detailed information available at the county and jurisdictional level. As more information becomes available, it will be incorporated in updates of the plan. Critical structures for each jurisdiction were identified in Section 1 and a map of these structures can be found in Appendix B. HAZUS estimated the county to have 7,584 buildings, of which 7,062 are residential. The total value of residential property is \$841,188,000. Dividing the total value by the number of homes (7,062), the average value was determined to be \$119,115. The same method was used to determine the average value of the other types of property in Figure 3.5.

Figure 3.4

Andrew County Building Stock Exposure									
Туре	Assessment	Building	Standard						
		Count	Value						
Residential	\$841,188,000	7,062	\$119,115						
Commercial	\$107,676,000	254	\$423,921						
Industrial	\$16,709,000	83	\$201,313						
Agricultural	\$19,827,000	125	\$158,616						
Religion	\$19,088,000	33	\$578,424						
Government	\$6,100,000	17	\$358,824						
Education	\$9,576,000	10	\$957,600						
Estimated Total	\$1,020,164,000	7,584	\$134,515						

Building Stock Exposure

Figure 3.4 details the building stock exposure for each jurisdiction, based on HAZUS and US Census 2010 housing unit data. The data for the unincorporated areas of the county was determined by taking the total building count for the county and subtracting the buildings in each jurisdiction. The standard value was determined by HAZUS assessments.

Building counts for education structures provided by the school districts notably differs from HAZUS estimates. The school district information in Figures 3.15 and 3.17 are based on the number of facilities as reported by the school district and not the HAZUS estimate.

Figure	3.5
--------	-----

	Building Stock Exposure									
	Number of Estimated Buildings Per Jurisdiction									
Jurisdiction	Residences	Commercial	Industrial	Agriculture	Religion	Government	Education	Total		
Andrew County	7,062	254	83	125	33	17	10	7,584		
Amazonia	136	5	2	1	1	1		146		
Bolckow	96	4	2	2	0	1		105		
Cosby	52	3	0	0	0	3		58		
Country Club	1,012	39	11	6	5	2		1,075		
Fillmore	89	4	0	5	1	0		99		
Rea	25	1	1	3	1	1		32		
Rosendale	74	1	1	0	1	1		78		
Savannah	2,187	103	28	17	12	7		2,354		
Unincorp- orated Areas	3,391	94	38	91	12	1		3,624		
Avenue City School							1*	1*		
North Andrew School							5*	5*		
Savannah School							15*	15*		

*Building count as reported by the respective school district.

Loss Estimates

Loss estimates provided below are based on available data and the methodologies applied result in an approximation of risk. Estimating potential losses is difficult because of gaps in historical records, lack of scientific consensus and a wide array of environmental variables. Uncertainties also result from approximations and simplifications, such as those made as a result of incomplete inventories, demographics or economic parameters.

These estimates measure property damage, while recognizing that death and injury are the primary reasons to mitigate hazards. FEMA guidance does not place a dollar value on human lives, but it is important to note that actions that modify community features may help save lives and reduce injuries in future hazard events.

Loss estimations were conducted for all the hazards presented in this plan based on the best available data and methodologies. For flooding, loss-estimation software was used. Totals reflect variances in data from HAZUS-MH.

Flooding and Levee Failure

The potential damage caused by flooding was outlined in previous sections. Due to the considerable impact of flooding, the vulnerability for this hazard is more detailed than other hazards. Figure 3.6 and Figure 3.7 shows vulnerability to flooding damage that was assessed using HAZUS-MH data. It is based on the 100-year flood plain.

1.1.	-	-
Figure	.5	.6
	-	

Expected Damage to Essential Facilities							
Classification	Total	At least moderate	At least substantial	Loss of use			
Fire stations	5	0	0	0			
Hospitals *	0	0	0	0			
Police stations	1	0	0	0			
Schools	10	3	0	3			

*There are no hospitals located in Andrew County

(Loss-estimations are based on data from HAZUS-MH)

Category	Residential	Commercial	Industrial	Others	Total
Building Loss					
Building Loss	\$5,770,000	\$210,000	\$40,000	\$290,000	\$6,320,000
Contents Loss	\$2,880,000	\$60,000	\$50,000	\$1,120,000	\$4,650,000
Inventory Loss	\$0	\$20,000	\$10,000	\$70,000	\$100,000
Subtotal	\$8,660,000*	\$820,000	\$100,000	\$1,490,000	\$11,060,000
Business Interruption Loss					
Income Loss	\$0	\$0	\$0	\$0	\$0
Relocation Loss	\$0	\$0	\$0	\$0	\$0
Rental Income Loss	\$0	\$0	\$0	\$0	\$0
Wage Loss	\$0	\$0	\$0	\$0	\$0
Subtotal	\$0	\$0	\$0	\$30,000	\$30,000
Total Loss	\$8,660,000	\$820,000	\$100,000	\$1,510,000	\$11,090,000

*\$10,000 difference is due to rounding

The building damage count general occupancy was also developed using HAZUS-MH data, based on a 100-year flood. The HAZUS data indicates that residential property would be damaged. Only residential property is included because HAZUS-MH data did not indicate

damage to other types of structures. See Figure 3.8. Figure 3.9 shows the number of people with shelter needs in a 100-year flood scenario.

Figure 3.8

Count of Buildings Sustaining Damage								
	1-10% Damaged	11-20% Damaged	21-30 % Damaged	31-40 % Damaged	41-50 % Damaged	Substantial (More than 50 %)	Total	
Number of Residences	0	0	0	2	6	15	23	

Figure 3.9

Shelter Needs					
	Number of Displaced	Number of People			
	People	Needing Short-			
		Term Shelter			
Andrew County	122	59			

Jurisdiction Assessments

Rosendale is located near the 102 River. The entire community is located in the 100-year floodplain. Flood damage is estimated at 100 percent based on the depth of potential flood waters, as measured by HAZUS-MH. See Figure 3.10.

Figure 3.10

Rosendale						
	Building Count	Standard Value	Estimated Loss (100 %)			
Residential	74	\$119,115	\$8,814,510			
Commercial	1	\$423,921	\$423,921			
Industrial	1	\$201,313	\$201,313			
Agriculture	0	\$158,616	\$0			
Religion	1	\$578,424	\$578,424			
Government	1	\$358,824	\$358,824			
Total	78		\$10,376,992			

Bolckow is located near the 102 River. Flood damage is estimated at 10 percent based on location and the depth of potential flood waters, as measured by HAZUS-MH. See Figure 3.11.

Bolckow						
	Building Count	Standard Value	Estimated Loss			
			(10 %)			
Residential	96	\$119,115	\$1,143,504			
Commercial	4	\$423,921	\$169,568			
Industrial	2	\$201,313	\$40,263			
Agriculture	2	\$158,616	\$31,723			
Religion	0	\$578,424	\$0			
Government	1	\$358,824	\$35,882			
Total	105		\$1,420,940			

Figure 3.11

Amazonia is located adjacent to the flood plain of the Missouri River. Flood damage is estimated at 15 percent based on location and the depth of potential flood waters, as measured by HAZUS-MH. See Figure 3.12.

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Amazonia						
	Building Count	Standard Value	Estimated			
			Loss			
			(15 %)			
Residential	136	\$119,115	\$2,429,939			
Commercial	5	\$423,921	\$317,941			
Industrial	2	\$201,313	\$60,394			
Agriculture	1	\$158,616	\$23,792			
Religion	1	\$578,424	\$86,764			
Government	1	\$358,824	\$53,824			
Total	146		\$2,972,654			

The communities of Country Club Village, Cosby, Fillmore and Rea have no assets susceptible to flooding.

Other Hazards

For other hazards besides flooding, maximum and minimum loss estimations were made. Maximum losses were calculated by averaging the probability and severity, the magnitude, the total exposure, and total population by district (see Figure 3.13). These loss runs assume total vulnerability of all assets and population to a particular hazard event. The solution was then qualified into a range representing loss estimation potential. (Methodology credited to the Mid-America Regional Council Hazard Mitigation Plan)

Figure 3	3.13
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Maximum Loss Estimation									
	Dam Failure	Drought	Earthquake	Heat Wave	Land Subsidence	Severe Winter Weather	Thunder- storm	Tornado	Wildfire
Overall Risk	Low	Medium	Low	Medium	Low	High	High	High	Low
Magnitude	Low	Medium	Low	Very High	Low	Very High	High	Medium	Low
Total Exposure	Low	Medium	Low	Low	Low	Medium	High	High	Low
Total Population	Low	High	Low	Medium	Low	High	High	Low	Low
Loss	Low	Medium	Low	Medium	Low	High	High	Medium	Low
Potential	(1)	(2.23)	(1)	(2.23)	(1)	(3)	(3)	(2.23)	(1)

Overall Risk (probability and severity) Low=1; Medium=2; High=3 Magnitude (percentage of Jurisdiction affected) Low= Negligible (0%-10%), Medium = Limited (10%-25%) High = Critical (25%-50%) Very High = Catastrophic (>50%) Total Exposure (dollar value); <\$5,000,000=1; \$5,000,000-\$10,000,000=2; >\$10,000,000=3 Total Population (in hundreds); 0-500=1; 501-2,000=2; >2,000=3 Maximum Loss Potential: 1-1.5 = Low; 1.6-2.5 = Medium; > 2.5 = High

Minimum Losses were calculated by averaging probability and severity, magnitude, annualized loss and average deaths/injuries (see Figure 3.14). Andrew County data was used due to limitations in the datasets. The same basic methodology was used to calculate the minimum loss estimation as was for the maximum loss estimation.

Figure 3.14

Minimum Loss Estimation									
	Dam Failure	Drought	Earthquake	Heat Wave	Land Subsidence	Severe Winter Weather	Thunderstorm	Tornado	Wildfire
Overall Risk	Low	Medium	Low	Medium	Low	High	High	High	Low
Magnitude	Low	Medium	Low	Very High	Low	Very High	High	Medium	Low
Annual- ized Loss	Low	Medium	Low	Low	Low	High	High	Medium	Low
Death, Injuries	Low	Low	Low	Medium	Low	Mediu m	Medium	Low	Low
Loss Potential	Low (1)	Medium (1.75)	Low (1)	Low (1.125)	Low (1)	High (3)	High (2.75)	Medium (2)	Low (1)

Overall Risk (probability and severity)-Low=1; Medium=2; High=3

Magnitude (percentage of Jurisdiction affected)-Low=Limited (0%-25%), Moderate=Critical

(25%-50%), High=Catastrophic (More than 50%)

Annualized Loss (dollar value); \$1,000=1; \$1,000-\$10,000=2; >\$10,000 = 3

Averaged Deaths/Injuries; 0=1; 0.1-5=2; >5=3

Maximum loss estimation potential; 1-1.5=Low; 1.6-2.5=Medium; Greater than 2.5=High

Potential Losses

Potential dollar loss estimates in terms of building values were calculated by: taking the overall vulnerability (percentage of jurisdiction affected), multiply that by the building count, and multiply that by the standard value. Standard values were calculated by dividing the building stock exposure figures by their corresponding building count numbers. Some hazards represent a threat to the entire planning area of Andrew County. The potential losses to structures are figured

on a county-wide basis, since the hazard is not jurisdictional specific. Standard values for the county were used.

Thunderstorms, Tornadoes

Thunderstorms, as outlined in Section 2, can cause damage to a widespread area. Tornadoes, in comparison, can cause more severe damage than thunderstorms, but the damage is limited to a smaller area. The planning committee used historic occurrences and the potential damage, the maximum and minimum loss estimate. The potential losses for thunderstorms are figured at five percent of building stock and the potential losses for tornadoes are figured at15 percent of building stock, as determined by HAZUS-MH scenario. The calculation was based on the average county building value of \$134,515 from Figure 3.3 (Andrew County: 7,584 x \$134,515 =\$1,020,161,760/5% =\$51,008,088 for thunderstorms and 7,584 x \$134,525 = \$1,020,161, 760/15% = \$153,024,264 for tornados). The standard value of \$957,600 was used for schools districts. See Figure 3.15.

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Jurisdiction	Building Count	Standard Value	Thunderstorms (5%)	Tornadoes (15%)
Andrew County	7,584	\$134,515	\$51,008,088	\$153,024,264
Amazonia	146	\$134,515	\$981,960	\$2,945,879
Bolckow	105	\$134,515	\$706,203	\$2,118,611
Cosby	58	\$134,515	\$390,094	\$1,170,281
Country Club	1,075	\$134,515	\$7,230,181	\$21,690,543
Fillmore	99	\$134,515	\$665,849	\$1,997,548
Rea	32	\$134,515	\$215,224	\$645,672
Rosendale	78	\$134,515	\$524,609	\$1,573,826
Savannah	2,354	\$134,515	\$15,832,416	\$47,497,248
Unincorporated Areas	3,642	\$134,515	\$24,374,118	\$73,122,354
Avenue City School	1	\$957,600	\$4,788	\$143,640
North Andrew School	5	\$957,600	\$23,940	\$718,200
Savannah School	15	\$957,600	\$71,820	\$2,154,600

Earthquake

Earthquakes are a potential hazard for the entire planning area of Andrew County. According to the Missouri Hazard Mitigation Plan, in a 2,500-year earthquake scenario, Andrew County would experience about \$9,012 in direct economic loss to buildings and \$1,890 in income losses, for a total loss of \$10,902.

Dam Failure

The potential for dam failure is outlined in Section 2. Because dams in Andrew County are located in rural areas, it is expected that a dam failure would impact structures located on the dam owner's property. The planning committee determined the maximum expected loss would be one residence and one agricultural building according to HAZUS-MH.

Potential losses are figured based on the standard values for the county from Figure 3.3 showing the standard value for residential structures is 119,115 (1 x 119,115 = 119,115) and agricultural is 158,616 (1 agricultural building x 158,616 = 158,616). See Figure 3.16.

			Figure 5.10			
Dam Failure						
	Building Count	Standard Value	100% Loss			
Residential	1	\$119,115	\$119,115			
Agricultural	1	\$158,616	\$158,616			
Total	2	\$277,731	\$277,731			

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Severe Winter Weather

Severe winter weather has been identified as a high risk hazard for Andrew County. Most of the economic impact of winter weather involves direct costs of snow removal, loss of business and environmental impact. These potential dollar losses are beyond the scope of this plan to assess. Structures could suffer damage from excessive snow cover or loss of electrical power. An assessment of potential losses was based on a 10 percent loss of structures according to HAZUS-MH. Building stock was based on the average county building value of \$134,515 from Figure 3.4. The standard value of \$957,600 was used for the schools districts. See Figure 3.17.
Severe Winter Weather												
Jurisdiction	Building Count	Standard Value	10% Loss									
Andrew County	7,584	\$134,515	\$102,016,176									
Amazonia	146	\$134,515	\$1,963,920									
Bolckow	105	\$134,515	\$1,412,408									
Cosby	58	\$134,515	\$780,187									
Country Club	1,075	\$134,515	\$14,460,363									
Fillmore	99	\$134,515	\$1,331,699									
Rea	32	\$134,515	\$430,448									
Rosendale	78	\$134,515	\$1,049,217									
Savannah	2,354	\$134,515	\$31,664,831									
Unincorporated Areas	3,642	\$134,515	\$48,748,236									
Avenue City School	1	\$957,600	\$95,760									
North Andrew School	5	\$957,600	\$478,800									
Savannah School	15	\$957,600	\$1,436,400									

Wildfire

The potential for wildfire in Andrew County is minimal, as outlined in Section 2. Based on the data available, the loss estimate was figured for five residences and two agricultural buildings. Potential losses are figured based on the standard value of residential (5 x 119,115/100% = 595,575) and agricultural (2 x 158,616/100% = 317,232). See Figure 3.18.

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Wildfire													
	Building Count	Standard Value	100% Loss										
Residential	5	\$119,115	\$595,575										
Agricultural	2	\$158,616	\$317,232										
Total	7		\$912,807										

Figure 3.18

Drought

Drought, as outlined in Section 2, can have measureable impact in Andrew County. An 18 year period record of NOAA data was used to determine the probability for drought. Over the 18 year record period 11 months were recorded as drought. There is a total of 216 months in the record period. The calculated risk percent from the number of months of drought and the total number of months in the record equates to the average annual percentage of 5% probability of drought occurrence in the county.

The 2013 State Plan states that from 1998 through 2012 there were \$18,150,174 in insured crop loss payments in Andrew County. There are no anticipated structural losses, loss of life, or injuries associated with this hazard. In addition, according to the USDA Risk Management Agency, there was a total of \$1,414,600 in Andrew County from 2013 - 2015. According to this data, the total losses divided by the 18 year timeframe (\$18,150,174 + \$1,414,600/18) equals \$1,086,932 in annualized crop losses.

Losses to crops and livestock would have repercussions throughout the economy because many businesses and industries in Andrew County are related to agriculture.

Heat Wave

Heat wave events are similar to drought in that the hazard presents little threat to structures. The greatest danger is to humans and animals.

The toll on human life due to heat waves in Andrew County has been minor, presumably due to the increased availability of air conditioning and increased public awareness of the hazards of extreme heat.

Land Subsidence/Sinkholes

The Hazard Mitigation Planning Committee concluded that land subsidence is a low threat in Andrew County because the one identified area susceptible to sink holes is an

unincorporated area and has not caused any known damage. There is no plan to develop the area. The maximum damage is per HAZUS is assessed at one residential $(1 \times 119,115/100\% = 119,115)$ and one agricultural structure $(1 \times 158,616/100\% = 158,616)$. See Figure 3.19.

Land Subsidence												
	Building Count	Standard Value	100% Loss									
Residential	1	\$119,115	\$119,115									
Agricultural	1	\$158,616	\$158,616									
Total	2	\$277,731	\$277,731									

Figure 3.19

City/County Capability Assessment:

Mitigation Management Policies

The Andrew County Emergency Management Agency (EMA) is charged with preparing for disasters. The EMA appoints a part-time Emergency Management Director. The director's duties include:

• Planning, organizing and directing county's emergency management plan with government and business officials.

• Outreach, including speaking before various groups to promote interest and cooperation in emergency situations.

- Advises and assists businesses in industrial emergency management programs.
- Meets with state and federal officials to coordinate county program.
- Prepares necessary documentation to affected agencies.
- Responsible for planning and coordination of county's disaster drills.

The director also works with others agencies and advises the county Commission on mitigation measures and implementing those measures deemed appropriate by the commission. In general, the county's policies encourage collaboration between Andrew County agencies as well as cooperation between other county agencies and those of neighboring jurisdictions.

The director serves all of Andrew County and its jurisdictions, working with elected officials, law enforcement, emergency responders and community agencies.

Existing Plans

The City of Savannah has an approved comprehensive plan and zoning regulations in order to manage growth issues. One of the goals for this plan is to encourage development in and around already-developed areas to provide more efficient access to adequate roadways, utilities, and emergency services.

The Local Emergency Operation Plan (LEOP) of the county is approved by the county commission. The plan was initially developed in 1988 with the assistance of the Mo-Kan Regional Council. The LEOP was rewritten in 2006 and is updated every year. The plan identifies facilities and resources that require special security during a disaster and promotes the development and maintenance of mutual aid agreements with nearby agencies and requires participation in drills and exercises. In addition, the plan identifies vulnerabilities in county-administered road, water and wastewater facilities and includes an evacuation plan.

Mitigation Programs

The main mitigation programs are the county's floodplain management regulations and participation and compliance in the National Flood Insurance Program (NFIP). As outlined in Section 2, the jurisdictions in Andrew County that participate in NFIP are Andrew County, Amazonia, Bolckow, Country Club Village, Rosendale and Savannah. The county coordinates with Missouri River levee districts through the U.S. Corps of Engineers to ensure development takes place within the guidelines established by Congress through the NFIP.

The county and municipal floodplain regulations are aimed at substantially restricting any new development in the floodplain. The current ordinance requires one foot of additional freeboard for new structures and for the elevation of major construction on existing structures. For structures outside the identified flood hazard areas, a two-foot minimum elevation above grade is required.

The county is able to receive National Weather Service warnings and all equipment is activated by radio. In an emergency situation, nearly half of the county's population could be alerted within 30 minutes, responders within five minutes, and key officials within 15 minutes.

School students have received substantial curricular training about hazards and emergency programs. Every school district in Andrew County conducts drills annually. The EMD provides information and gives emergency management training in a number of venues,

including churches, businesses, service clubs and private organizations and industry. Various groups have had training through the Local Emergency Planning Committee. Funds from SEMA have helped pay for many of these activities.

The EMD receives ongoing training and other emergency response personnel have received extensive training. Emergency Operation Center (EOC) staff and volunteer staff have received training, as well.

Geographic Information System (GIS) capabilities are now available for Andrew County. This capability facilitates the development of limited hazard area base maps. Maps are available to residents through the Andrew County Assessor's office and GIS information is accessible to the public through the county's web site.

City and County Capabilities

The capabilities of emergency management, fire protection, law enforcement, and emergency medical services are detailed in Section 1. The EOC in Andrew County meets FEMA established guidelines for an EOC. The criteria for the EOC is a place from which key officials can direct and control an emergency response.

The EOC relocated to the new Andrew County jail in 2013. The site has survivable communications from primary and other operating forces, the Emergency Alert System, commercial and public broadcast stations, SEMA, adjacent jurisdictions, and other incorporated areas within the county. The communications and warning equipment are tested on a scheduled basis. Warning sirens are located throughout Savannah and most communities, including Amazonia, County Club Village, Bolckow and Rosendale. Many areas of the county are not covered by warning sirens. Of particular concern are densely populated portions of Andrew County, including Cosby, whose warning siren is currently out of commission, and the unincorporated area of Avenue City, which has an elementary school.

The cities and county continue to upgrade their communication abilities as they are able. All communications systems are interoperable with other systems. The EOC has an adequate number of radios. The enhanced 911 system serves the entire county and is located at the Andrew County Sheriff's Office and Jail.

Fire equipment and vehicles are available to city and county agencies. Equipment available for police, rescue, mass care, and information/communications is generally sufficient,

although various equipment upgrades would be prudent. The Andrew County Ambulance District provides complete triage care.

The EMA director has received training in emergency response planning, professional development, emergency response operations, exercises, disaster response and recovery, and disaster mitigation and participates in ongoing training programs. Emergency response personnel and EOC staff have received considerable training. Appropriate officials have had limited training on hazard mitigation.

Responsibilities and Authorities

The chief elected official (CEO) has the legal basis for the following:

- Authorization to order an evacuation
- Redirect funds for emergency use
- Order a curfew
- Commandeer facilities and/or equipment and materials.

The CEO for Andrew County is the presiding commissioner, while the chief elected official for the City of Savannah is the mayor. The Governor for Missouri, SEMA and FEMA may supersede the local CEO. The CEO's responsibilities include:

• Safeguarding vital records (although limited for records needed to reconstitute local government)

- Analysis of the possible impacts of potential disasters
- Providing a multi-hazard emergency operations plan

• Encouraging the limited completion of mutual aid agreements with neighboring jurisdictions; and

• Protection of people with special needs.

Intergovernmental and Interagency Coordination

The Andrew County Local Emergency Planning Committee (LEPC) meets quarterly and serves to maintain coordination among fire, law enforcement, emergency medical, and public health officers from the county, incorporated areas and adjacent jurisdictions. LEPCs are crucial to the success of the Emergency Planning and Community Right-to-Know Act (CRKA).

Appointed by the Missouri Emergency Response Commission, local planning committees must consist of representatives of all of the following groups and organizations: elected state and

local officials; law enforcement, civil defense, firefighting, first aid, health, local environmental, and transportation agencies; hospitals; broadcast and print media; community groups; and representatives of facilities subject to the emergency planning and CRKA requirements. Jurisdictions in Andrew County that participate in the LEPC include Andrew County, Amazonia, Country Club Village, Cosby, Fillmore, Rea, Rosendale, Avenue City School District, North Andrew School District and Savannah School District.

The LEPC's initial task was to develop an emergency plan to prepare for and respond to chemical emergencies. EPA's list of extremely hazardous substances can provide the focus for setting priorities. The plan must be reviewed annually, tested and updated. Because the LEPC's members represent the community, they are to be familiar with factors that affect public safety, the environment and the economy of the community.

An emergency plan must include the identity and location of hazardous materials, procedures for immediate response to chemical accidents, ways to notify the public about actions they must take, names of coordinators at plants, and schedules and tasks for testing the plan. The State Emergency Response Commission (SERC) reviews the plan, and the LEPC must test the plan through emergency exercises and update it at least annually.

Another responsibility of the LEPC is to receive emergency release and hazardous chemical inventory information submitted by local facilities, and must make this information available to the public upon request.

LEPCs have the authority to request additional information from facilities for their own planning purposes or on behalf of others. In addition, LEPCs can visit facilities in the community to gain information in order to reduce hazards, prepare for accidents, and reduce hazardous inventories and releases. Finally, LEPCs can take civil actions against facilities if they fail to provide the information required under the CRKA.

In addition to its formal responsibilities, the LEPC serves as a focal point in the community for information and discussions about hazardous substances, emergency planning, and health and environmental risks due to hazardous substances. Citizens can expect the LEPC to reply to questions about chemical hazards and risk management actions.

An LEPC can most effectively carry out its responsibilities as a community forum by taking steps to educate the public about chemical risks, and working with facilities to minimize those risks.

Vulnerability Assessment of County Policies and Development Trends: Commitments to a Comprehensive Mitigation Program

Andrew County has a history of striving to protect the life and livelihood of its residents. In the aftermath of the Flood of 1993, the county strengthened mitigation measures and policies. On a comprehensive basis, the county maintains and regularly updates the Emergency Operations Plan that includes mitigation measures for all natural and manmade hazards.

County Laws, Regulations and Policies Related to Development in Hazard Prone Areas

The floodplain management ordinance, established in 1993, is based on policies to protect the general welfare and health of residents and visitors of the county. The ordinance is designed to safeguard health, safety and property in times of flooding by restricting avoidable increases in flood height or velocity, mitigating losses at time of construction of public facilities and protecting individuals from buying land unsuited for the intended use due to flood hazard. The county's floodplain ordinance meets the requirements set forth by National Flood Insurance Program (NFIP).

County Laws, Regulations and Policies Related to Hazard Mitigation in General

Ordinances specifically related to Floodplain Management can be found in the Andrew County regulations.

How Local Risk Assessments are Incorporated and Prioritized into Local Planning

Since riverine flooding has a significant impact upon the county, a separate and detailed ordinance to protect life and property in the floodplain is included within the body of regulations. Second on the list is the risk of flash flooding. Additional warning capabilities are being studied to mitigate the impacts of flash flooding, tornadoes and severe thunderstorms.

The county also recognizes the danger and economic impact of severe winter storms. Clearing snow and ice from roadways is the main priority during winter storms. The County Road and Bridge Department removes ice and snow from all county maintained roads to minimize accidents and ensure access to employment. Missouri Department of Transportation (MoDOT) clears state and federal roadways.

Current Criteria Used to Prioritize Mitigation Funding

Mitigation funding is based primarily upon the combination of expected damage and death/injury impacts. For example, the City of Rosendale historically has a high risk of recurring riverine flooding accompanied by high damage rates. Therefore, the community ranks high on the mitigation prioritization list.

Another facet of the county's mitigation concerns is the intensity of development pressures along Interstate 29, which was noted in the 2011 plan. The comprehensive plan calls for concentrating new land use and economic development in and around higher-density areas to provide greater access to infrastructures and emergency measures.

Integration of Hazard Mitigation with City/County Plans

The county EMA committee includes representatives from fire districts, law enforcement, emergency medical, the public, news media and health organizations. The cities rely on the county's EOP. In addition, the Local Emergency Planning Committee meets quarterly; more often if needed.

Andrew County also appoints a floodplain administrator. The position is currently filled by the county assessor. The administrator's duties are as follows:

1. Review of all applications for floodplain development permits to assure that sites are reasonably safe from flooding and that the floodplain development permit requirements have been satisfied.

2. Review of all applications for floodplain development permits for proposed development to assure that all necessary permits have been obtained from federal, state or local governmental agencies from which prior approval is required by federal, state or local law.

3. Review all subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, to determine whether such proposals will be reasonably safe from flooding.

4. Issue floodplain development permits for all approved applications.

5. Notify adjacent communities and the state emergency management agency prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the FEMA.

6. Assure that maintenance is provided within the altered or relocated portion of any watercourse so that the flood-carrying capacity is not diminished.

7. Verify and maintain a record of the actual elevation (in relation to mean sea level) of the lowest floor, including basement, of all new or substantially improved structures.8. Verify and maintain a record of the actual elevation (in relation to mean sea level) that the new or improved non-residential structures have been flood-proofed.

9. When flood-proofing techniques are utilized for a particular non-residential structure, the floodplain administrator shall require certification from a registered professional engineer or architect.

How the County Determines Cost-Effectiveness of Mitigation Programs

The state's administrative plan governs how projects are selected for funding. However, proposed projects must meet certain minimum criteria. These criteria are designed to ensure that the most cost-effective and appropriate projects are selected for funding. Both the law and the regulations require that the projects are part of an overall mitigation strategy for the disaster area.

The state prioritizes and selects project applications developed and submitted by local jurisdictions. The state forwards applications consistent with state mitigation planning objectives to FEMA for eligibility review. Funding for this grant program is limited and states and local communities must decide the most effective use of grant funds. The County examines each mitigation program on a case-by-case basis. The determination depends on the scope of damages, estimated savings in future hazard events, the type of mitigation project and the probable hazard to human life in future events. FEMA-funded mitigation projects must meet the benefit/cost analysis criteria required by FEMA. FEMA has established five issues a community must consider when determining the eligibility of a proposed project:

- Does your project conform to your state's hazard mitigation plan?
- Does your project provide a beneficial impact on the disaster area?
- Does your application meet the environmental requirements?
- Does your project solve a problem independently?
- Is your project cost-effective?

The Disaster Mitigation Act of 2000 authorizes up to seven percent of the Hazard Mitigation Grant Program (HMGP) ceiling to be used for the development of state, Indian tribal, and/or local mitigation plans that meet the planning criteria outlined in 44 CFR Part 201. A benefit-cost analysis is not required for the use of the seven percent planning funds.

Mitigation Funding Options

(Including Current and Potential Sources of Federal, State, Local, Private)

The county and incorporated areas have historically relied upon federal disaster declarations in cases of heavy widespread damages. Sources have included FEMA, SEMA, the Missouri Department of Natural Resources, Department of Economic Development and various other grant programs. In addition, investments in infrastructures that have mitigating effects have been funded from sources such as local tax revenues. Other funding options include the grant sources identified in SEMA's Regional Planning Commission Hazard Mitigation Planning Guide – 2002.

How County Government Meets Requirements for Hazard Mitigation Funding Programs

The City of Savannah and Andrew County's EOP work toward meeting the requirements set forth by both FEMA and SEMA in regards to hazard mitigation funding programs. As previously noted, Savannah has floodplain ordinances, zoning ordinances and subdivision regulations in place to ensure against floodplain development, which provide sound guidelines for sewer and water installations, roadway construction and zoning regulations. Andrew County does not have planning or zoning ordinances in place, however the county does take part in the NFIP.

Jurisdiction Policies and Development Trends

Savannah and County Club Village have a comprehensive land use plan in place. Figure 3.20 below shows that three cities have zoning and subdivision regulations. Two have storm water regulations and building codes in place. Due to recent, dense growth, County Club Village has adopted several hazard-related statutes.

Figure 3.20

Hazard-Related Statutes by Municipality													
	Comp. Land Use Plan	Zoning	Building Codes	Earthquake Design	Subdivision Regulations	Storm Water Regulations	Flood Plain Regulations						
Andrew County	No	No	No	No	No	No	Yes						
Country Club	Yes	Yes	Yes	No	Yes	Yes	Yes						
Cosby	No	No	No	No	No	No	No						
Rosendale	No	Yes	No	No	Yes	No	Yes						
Fillmore	No	No	No	No	No	No	No						
Rea	No	No	No	No	No	No	No						
Amazonia	No	No	No	No	No	No	No						
Bolckow	No	No	No	No	No	No	Yes						
Savannah	Yes	Yes	Yes	Yes	Yes	Yes	Yes						

Recommendations for Improvement

Recommended improvements include jurisdictions seeking out funding opportunities to purchase storm warning sirens and build safe rooms. Although these mitigation actions have ranked highly in the past plan, jurisdictions will need to address these pressing concerns. Other recommendations include establishing a 24-hour tornado shelter in Savannah and creating a list of vulnerable residents for emergency responders. The availability of tornado shelters in mobile home parks has been encouraged but unless ordinances are passed or financial incentives awarded its unlikely shelters will be constructed. Workplace emergency plans for tornadoes and other disasters should be encouraged.

Educational campaigns aimed towards wildfire prevention and drought management are also recommended. Wildfires tend to be small but many are preventable. Further promotion of drought-resistant farming techniques and water conservation could be beneficial to the residents of Andrew County due to its large agricultural sector and drought susceptibility in some areas of the county. The county may consider formulating a contingency plan in case the water reservoir becomes unusable.

The planning committee and emergency management director determined that man-made disasters would not be covered in this update since the LEPC addresses response to man-made disasters and there is thought to be a low probability of this occurring on a scale considered a

disaster. The planning committee may reexamine this position as mass-shootings and virus outbreaks have occurred in rural settings. Several key members on the planning committee have recently retired so the next plan update will be examined with a new perspective.

Section 4: Mitigation Strategy

Definition of Mitigation

The Federal Emergency Management Agency (FEMA) defines mitigation as "sustained action taken to reduce or eliminate the long-term risk to people and property from hazards and their effects." The jurisdictions of Andrew County that participated in this process have the goal of taking the appropriate level of mitigation actions to meet their responsibilities for the health and safety of the residents of the county. The goals of disaster mitigation planning, like those of disaster preparedness and disaster response, are to reduce or eliminate loss of lives and property in the next event.

Categories of Mitigation

Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening or lessen its damaging effects. Efforts by federal, state and local governments can restrict development in vulnerable areas, direct new development to less vulnerable areas and promote ways to safeguard existing development in hazard-prone areas. Individuals can also participate by practicing sound personal safety and damage prevention measures.

There are six categories of mitigation that can produce safer environments: prevention, property protection, natural resource protection, emergency services, structural projects, and public information.

• **Prevention** tools include regulatory methods such as planning and zoning, building regulations, open space planning, land development regulations and storm water management.

• **Property protection** measures reduce the risk of building damage through acquisition of land, relocation of buildings, modification of at-risk structures and flood proofing at-risk structures.

• Natural resource protection can reduce hazard impacts through measures such as erosion and sediment control or wetlands protection.

• **Emergency services** measures include warning, response capacity, critical facilities protection, and health and safety maintenance.

• **Structural** mitigation controls natural hazards through projects such as reservoirs, levees, diversions, channel modifications and storm sewers.

• **Public information** includes providing hazard maps and information, outreach programs, real estate disclosure, technical assistance and education.

Mitigation Versus Preparedness, Response and Recovery

Mitigation does not include other emergency functions such as preparedness, response or recovery. Preparedness deals with improving capabilities before a disaster strikes. Response is a disaster-onset activity to immediately save lives and protect property. Recovery is a post-disaster activity to return all systems to a normal status. Though fundamentally important to the emergency planning process, these activities are beyond the scope of this plan and will not be discussed.

Mitigation Plan Benefits

Hazard mitigation planning is a tool communities may use to:

- Reduce death, injury and property losses.
- Identify specific problems and appropriate solutions.
- Achieve multiple objectives in a sustainable and efficient manner.
- Reduce future risks.
- Prioritize post-disaster projects.
- Enhance funding opportunities through federal, state and local programs.
- Promote public participation and ownership of solutions.

Mitigation Actions Considered

The following mitigation actions are associated with the various hazards that could potentially impact Andrew County.

The county initially conducted public meetings in 2004 when creating the original hazard mitigation plan, which was adopted by jurisdictions in 2004 and 2005. The plan was updated in 2011. During the third plan in 2015, Andrew County held public meetings to gather input from citizens about hazards and potential methods to mitigate the impact. The original goals, objectives and actions were discussed and graded based on completion, implementation and applicability to Andrew County.

The planning committee voted to keep the 2011 goals and objectives. The action items were updated to reflect progress that has been made and changes that have taken place in the county since the last was first adopted. Some items were considered to be a priority for the county and were continued as goals. One was considered to be no longer appropriate.

The following actions were considered in the preparation of the updated plan. The committee, realizing that some efforts are better suited for the county than others, ranked each measure according to cost effectiveness and cost/benefit ratios.

Each mitigation method is followed by a rank, indicating effectiveness. A rank of "1" indicates the highest probability of effectiveness, while a rank of "5" indicates the lowest. The rankings were averaged.

• Acquisition of Hazard-Prone Structures – This action is normally associated with floodplain buyout efforts through FEMA. However, it can be adapted to any area or set of structures that are particularly prone to natural hazards. **Rank: 4**

• Active Public Education and Awareness – This action involves producing and distributing a coherent message about an organization's ongoing actions designed to reduce the community's vulnerability to natural disasters. Rank: 2

• **Best Management Practices (BMPs)** – BMPs require developers to comply with a set of researched standards in the design or construction of a facility. For example, a developer may be required to use a particular construction method on certain soils that are known to be susceptible to shifting or settlement and possibly even landslides. BMPs should be reviewed by professional staff and adopted by the governing body whenever possible. **Rank: 2**

• **Building Codes** – An adopted set of standards that describe, in detail, acceptable construction methods, materials, and practices. Building codes are used to ensure that minimum life safety standards are met to lower hazard vulnerability. **Rank: 2**

• **Building Density Controls** – Controlling building density levels by either requiring higher or lower density development in certain areas based upon the community's comprehensive plan, or in response to specific environmental or hazard mitigation challenges. **Rank: 2**

• **Channel Maintenance** – This practice keeps naturally occurring drainage channels clear of obstruction and fixes potential erosion-prone areas to prevent upstream flooding. Building dams above an area that is prone to flood can reduce flash flooding. **Rank: 3**

• **Construction of Barriers around Structures** – This action is normally expressed in the construction of flood levees and alternate drainage pathways around flood-prone areas. **Rank: 2**

• **Critical Facilities Protection** – This protection is expressed by hardening facility against expected natural hazards. This is typically done only to key facilities that cannot be relocated and are particularly exposed to a potential natural hazard scenario. Some examples include increasing structural stiffness in buildings subject to excessive wind loading, or fireproofing a structure that may be exposed to forest fires. **Rank: 1**

• **Dam Breach Exclusion Zones** – This zone excludes new construction in areas that are located below a dam structure. This exclusion zone is the area that would be damaged during a catastrophic or partial dam failure. **Rank: 3**

• **Dams**/ **Reservoirs** – The construction of water control devices to reduce levels of run-off, provide flood control and supply adequate water reserves for times of above normal demands. **Rank: 4**

• **Design Review Standards** – A set of design and review standards that ensure all development complies with written and adopted environmental goals and objectives. An example may be a jurisdiction disallowing wood shake roofs on residential structures within 500 feet of an established forested area. **Rank: 2**

• Easements – The right of a person, government agency or public utility company to use public or private land owned by another for a specific purpose. This is the granting of one or more property rights by the owner to, or for the use by, the public, a corporation, or another person or entity. Rank: 3

• Elevation of Structures – The requirement to construct all buildings a minimum of one-foot above the 100-year flood plain elevation. This elevation is determined by the official FEMA Flood Hazard Maps used by the flood plain administrator. **Rank: 4**

• Emergency Response Services – These are all life and property preservation, rescue, and protection services provided by the government, including fire and police protection, EMT and communications. Rank: 1

• Environmental Review Standards – A set of standards that ensure all development meets adopted environmental goals and objectives. An example may be a jurisdiction disallowing the

disturbance of topsoil in certain delineated watershed areas because increased sedimentation may affect an endangered species. **Rank: 3**

• Floodplain Development Regulations – A written and adopted set of standards for the type, density, and purpose of development allowed within the 100-year floodplain. Community members can buy flood insurance if they their respective jurisdiction participates in the National Flood Insurance Program. Rank: 3

• Floodplain Zoning – The written and adopted set of zoning regulations based upon professional engineering standards, prohibiting construction of structures within the 100-year flood plain. Rank: 3

• Forest Fire Fuel Reduction – By using forestry management tools, a community can reduce the amount of fuel in a timber or vegetation stand to levels that significantly reduce the risk of wild fires. Rank: 4

• Hazard Information Centers – These are public information kiosks, web sites, toll free numbers, designated points of contact, or other outreach actions containing official information on all perceived natural hazards and the community actions being taken to guard against potential impact. Rank: 4

• Hazard Threat Recognition – Actions by those charged with the public safety to ensure that they anticipate and respond adequately to prevent and mitigate natural hazards. Rank: 3

• Hazard Warning Systems – Devices and plans to ensure that the maximum number of people have as much advance warning of impending natural disasters as is practical. This includes warning sirens and NOAA weather radios. It may also include partnerships with local broadcast media and institutions with large populations or special needs. **Rank: 1**

• Health and Safety Maintenance – Maintaining the public health and safety in a high state of preparedness for the next natural disaster. For instance, having evacuation drills and plans for the removal of seniors from a convalescent center located within a 100-year flood plain. Rank: 2

• Hillside Development Regulations – Restrictions on development in areas that are prone to landslides or rapid erosion. These areas are typically hard to reach with public safety equipment during an emergency. By not allowing these sites to develop, a community reduces the risk of not being able to reach a sizable population during an emergency. Rank: 3

• Levees and Floodwalls – Flood control structures that allow floodwaters to rise to a level above flood stage on one side of the structure and help prevent the lack flooding on the other. Rank: 3

• **Open Space Preservation** – This preservation ensures that open space is protected in a community. It provides many recreational and aesthetic benefits to the citizens and prevents vulnerable areas from being developed. **Rank: 3**

• **Post-disaster Mitigation** – Finding the opportunities presented in a post-disaster situation to implement stronger disaster mitigation actions. For instance implementing previously identified mitigation actions that have an increased political acceptability immediately after a disaster. Rebuilding a devastated area in a more disaster-resistant manner is another possible post-disaster mitigation action. **Rank: 1**

• **Preparedness** – Actions to enhance survivability and assure effective response to emergencies (i.e. family preparedness, emergency operations plans and procedures, training and exercises). **Rank: 1**

• **Real Estate Disclosure Statements** – Requiring disclosure by the seller prior to purchase to a potential buyer that a particular piece of property is located within a disaster overlay zone. These zones are found within the community's comprehensive plan. **Rank: 2**

• **Relocation Out of Hazard Areas** – This is normally a voluntary action whereby a government program purchases parcels of property in high hazard areas. It places deed restrictions upon the property prohibiting its future use as a site for structure or dwelling, thus assuring the funding agency it will not have to repurchase the property in the future. "Buyout" zone residents are normally afforded some financial assistance to relocate out of the buyout zone. **Rank: 2**

• Safe room/Shelter – This action incorporates or retrofits proven tornado and storm resistant room design construction methods into new construction or building rehabilitation actions. Lives may be saved by providing design and financial assistance for constructing hardened shelter rooms. Rank: 2

• Sediment and Erosion Control Regulations – A set of restrictions prohibiting construction on certain soils based upon poor slope, composition or other factors. For instance, soils on hillsides that flow easily during the rainy season would have restrictions to prohibit building on or below them. Rank: 3

• **Special Use Permits** – Permits authorized by the zoning code that allow for temporary action events or construction in certain zones where they would not normally be allowed. For instance, a festival and all the support buildings, facilities and utilities could be located in the 100-year floodplain for a limited time. **Rank: 4**

• Storm Water Management Regulations – This action is normally part of a master Storm Water Management Strategy. The community identifies vulnerable areas and suggests remediation methodologies, restrictions, and regulations. Once documented and adopted, these strategies are normally administered by the public works or engineering staff. Rank: 3

• Stream Corridor Restoration – This action is the repair and maintenance of blocked or otherwise restricted natural drainage ways. Cleaning out vegetation and debris, re-grading the side slopes and pitch of a drainage way and observing the results of subsequent rainfall events help provide adequate remediation. Rank: 4

• Stream Dumping Regulations – This action places restrictions on the placement of dead vegetation and other possibly restrictive debris in a natural drainage way. Proper and proactive management of trees and vegetation in urban and suburban areas can prevent the temporary loss of utility services by breaking above-ground lines during storm occurrences. Rank: 3

• **Structural Retrofits to Existing Buildings** – The physical internal and external upgrading of a pre-existing structure to meet anticipated natural disaster loads and forces. **Rank: 4**

• Subdivision and Development Regulations – An adopted set of standards for all new developments detailing street, utility, subdivision and easement design criteria. It may include acceptable materials for construction as well as right-of-way requirements for the jurisdiction.

Rank: 2

• **Transfer of Development Rights** – Groups or governments interested in controlling sprawl, preserving open space or wishing to preserve an environmental asset may seek the conveyance of development rights by deed, easement, or other legal instrument to a parcel of land and the recording of that conveyance. For instance, a farmer may sell development rights to his land, while retaining ownership of the land, and thus the ability to continue farming the land. **Rank: 3**

• Underground Utility Relocation – This action makes utilities more resistant to storms, hail, wind and other violent events by placing them underground. Normally this is considerably more expensive in the short term. Rank: 4

• Urban Forestry and Landscape Management – Proper and proactive management of trees and vegetation in the urban and suburban areas can prevent the temporary loss of utility services by breaking above-ground lines during storm occurrences. **Rank: 4**

• Utility & Building Design Performance Standards – This is an additional set of regulations that require a facility to meet performance standards. These may be as simple as stating "Buildings located in the Forest Fire Precautions Overlay Zone will meet NFPA standards for all roofing and building materials." Rank: 3

• Wetlands Development Regulations – Wetlands act as environmental buffers, lessen storm surge and flash flood events, and maintain a natural component of the local ecology. By restricting development within wetlands, or by making up for their loss with other measures, disaster resistance is increased. Rank: 4

Disaster Mitigation Choices

Section 1 detailed a wide range of background information about Andrew County to establish a common reference point between all of the partners involved in this process.

Section 2 determined the scope of potential natural disasters that may confront the county. The chapter detailed the existing site, situation, geographic hazards, and weather hazards that have the potential to cause death or injury or property damage in Andrew County. From historical and anecdotal evidence, each hazard's likely occurrence interval was determined, as well as the potential for impact and disruption.

Section 3 examined the weaknesses and capabilities of Andrew County, gauging the county's potential to respond to disasters. The section also included a review of the rules and regulations already in place to assist in the process.

Section 4 represents the final step in this plan, but not in the disaster mitigation process. The next step is to determine the mitigation strategies that should be implemented, if operationally feasible and fiscally prudent. The following factors were used in analyzing mitigation efforts:

- 1. Is the mitigation effort proven effective in this or other jurisdictions?
- 2. Is the mitigation effort and its impact(s) acceptable to the county and jurisdiction?

3. Is the mitigation effort one that will provide a good return on the taxpayers' investment?

4. Is the mitigation effort applicable to multiple hazards?

5. Is the mitigation effort comparable with current or future staff capabilities?

6. Is the mitigation part of an overall comprehensive mitigation strategy?

When presented with a set of strategic choices, it is wise to look for strategies that offer the most effectiveness while being the lowest cost. We look for strategies that have worked in other communities like ours. We look at the potential legal, staffing and implementation costs of each option.

Funding options for various types of mitigation include: annual budget line item, Community Development Block Grants (CDBG), capital improvements project funding, authority to levy taxes for specific purposes, fees for water, sewer, gas or electric service, impact fees for homebuyers or developers for new developments and homes, incur debt through general obligation bonds, private activity bonds, special tax and revenue bonds, withhold spending in hazard-prone areas, public grant-loan packages and private grant-loan packages.

Typical staffing matches to mitigation programs include planning and zoning, inspector, surveyor, emergency personnel, flood plain manager, emergency management director, GIS team, grant writer, regional planning council, special scientific staff and legal.

Analysis and Prioritization of Mitigation Actions

Andrew County's mitigation actions promote and/or support the development of local hazard mitigation plans, projects and activities. Examples include targeting repetitive flood loss properties for buyout and instituting additional environmental measures (such as watershed protection) as well as encouraging local building codes, emergency operation plans, comprehensive plans, planning and zoning ordinances, floodplain ordinances, local disaster plans, local mitigation plans, and commercial/industrial disaster plans.

Goals, Objectives, Strategy and Coordination

Andrew County's mitigation goals were derived from existing goals in the comprehensive plan, St. Joseph Missouri's Project Impact (whose jurisdiction adjoins Andrew County to the south) the Andrew County Local Emergency Operations Plan (LEOP), Mo-Kan Regional Council's Flood Buyout Program Guide of 1994, the Disaster-Resistant Jobs Strategy, and the Mo-Kan Region Comprehensive Economic Development Strategy (CEDS).

Mitigation goals and objectives are:

Goal 1: Protect the Lives, Property and Livelihoods of All Citizens.

- Objective: Protect citizens' lives and property.
- Objective: Provide sufficient warning of impending disasters.
- Objective: Identify the citizens most vulnerable to disasters and plan accordingly.

Goal 2: Manage Growth in Designated Hazard Areas Through Sustainable Policies, Principles and Practices.

- Objective: Decrease the impact of disasters.
- Objective: Decrease the cost of the next disaster.
- Objective: Increase our economic resistance to disasters.

Goal 3: Ensure Access to Information Regarding Hazards Preparation and Recovery.

Objective: Increase knowledge among citizens about disaster safety.

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster.

- Objective: Increase disaster mitigation management capability in local governments.
- Objective: Strengthen critical infrastructure.

Evaluation

The following table provides an analysis of the proposed mitigation actions for Andrew County and the participating jurisdictions. The planning committee reviewed each of the action items identified as part of the Hazard Mitigation Plan adopted in 2011. During the revision process in 2015, the planning committee members reviewed the items and made adjustments to the score according to actions taken since the plan was adopted. A number of the reviews were done independently and a mean was figured if several jurisdictions reviewed the same action.

Each action was reviewed according to the STAPLEE criteria and Mitigation effectiveness criteria. STAPLEE criteria include: Social, Technical, Administrative, Political, Legal, Economic and Environmental considerations. It also included two questions: 1) Will historic structures be saved or protected? and 2) Could it be implemented quickly? Each criteria was given 0 to 3 points (Definitely YES = 3, Maybe YES = 2, Probably NO = 1, Definitely NO = 0).

Mitigation effectiveness criteria was based two questions: Q1) Will the implemented action result in lives saved? and Q2) Will the implemented action result in a reduction of disaster damages? Each question was given 5 - 10 points (5 is the least, 10 is the most). The priority level for the action is considered high if the score is 30 points or higher, medium for 25-29 points and low for less than 25 points.

	S	T	A	Р	L	E	E	Histor Structur	Impleme Quickb	Lives Sav	Damag Reductio	SCORE
								ic 'es?	nted y?	ved?	ge on?	
Objective 1.1: Protect our citizen	s' li	ves	and	pro	per	ty.	I		1	I	1	L
Action 1.1.1: Prepare Public Service Announcements, deliver to the media and have ready to be published during emergencies and disasters.	3	3	2	2	3	2	2	0	3	10	7	37
Action 1.1.2: Encourage residents to purchase weather radios to ensure that they have sufficient access to information in times of disasters.	3	3	2	2	3	2	2	0	2	10	7	36
Action 1.1.3: Encourage the incorporation and design of shelters in the construction of new public facilities like libraries, community centers, etc.	3	3	3	3	3	3	3	0	3	10	5	39
Action 1.1.4: Incorporating hazard buffer zones into subdivision platting regulations.	2	1	2	2	2	3	2	2	0	6	7	29
Action 1.1.5: Maintain an up-to-date list of addresses with shelters to assist fire departments and emergency services agencies to locate survivors after a disaster.	3	2	2	2	2	2	2	0	0	7	5	27
Action 1.1.6: Continue program to provide air conditioners to people in the community who do not have them and are at risk during a heat wave.	2	2	2	2	2	2	2	0	2	7	5	28
Action 1.1.7: Work with private entities, such as churches and businesses, to encourage the construction of tornado shelters in facilities where large numbers of people live, work or congregate.	3	2	3	3	3	3	3	0	3	10	9	42
Action 1.1.8: Designate certain air- conditioned facilities as "heat emergency shelters" and encourage people without air conditioning to use them in a heat wave.	2	2	2	2	2	2	2	0	3	7	5	29
Action 1.1.9: Consider offering residential and commercial builders and developers tax incentives to encourage the construction of safe rooms in new homes and commercial	3	1	0	0	0	0	2	0	0	10	5	21

	S	Т	Α	Р	L	E	Е	Historic Structures?	Implemented Quickly?	Lives Saved?	Damage Reduction?	SCORE
buildings.												
Action 1.1.10: Assess existing public facilities for the location of suitable safe areas. If available, these safe areas should be clearly marked and employees and visitors informed of their location in public facilities.	3	3	3	3	3	3	2	0	3	10	7	40
Action 1.1.11: Review emergency access routes and evacuation routes and mitigate any problem areas.	2	2	2	2	2	1	2	0	1	5	5	24
Action 1.1.12: Form and train Community Response Teams in cities and neighborhood associations.	3	2	3	2	2	2	2	0	1	8	5	30
Action 1.1.13: Build permanent storm shelters in mobile home parks.	3	3	3	3	3	3	3	0	3	10	10	44

Objective 1.2: Provide sufficient warning of impending disasters.

Action 1.2.1: Encourage a NOAA weather radio in continuous operation in all facilities offering public accommodations.	3	3	3	3	3	3	3	0	3	10	7	41
Action 1.2.2: Cities that do not already possess warning systems should purchase a system.	3	3	3	3	3	3	2	0	2	10	10	42
Action 1.2.3: Explore use of electronic methods, including Internet, Twitter, texting and calling systems to notify public of a hazard.	3	3	3	3	3	3	3	0	3	10	10	44
Action 1.2.4: Place warning sirens in densely populated unincorporated areas.	3	3	3	3	3	3	3	3	3	10	10	47

Objective 1.3: Identify the citizens most vulnerable to disasters and plan accordingly.

Action 1.3.1: Inform citizens what to do to	3	2	2	2	2	2	2	0	2	7	5	29
help elderly and disabled friends, neighbors												
or employees.												
Action 1.3.2: Continue to evaluate	3	2	3	2	3	2	2	0	0	7	5	29
accommodating individuals with special												
needs in emergency shelters, including												
compliance with the Americans with												
Disabilities Act (ADA).												
Action 1.3.3: Work with organizations and	3	2	2	2	3	2	2	0	1	6	5	28
utilities to provide materials and volunteer												
labor to assist at-risk groups in winterizing												
their homes.												
Action 1.3.4: Update inventory of facilities	3	3	3	3	2	2	2	1	2	10	7	38

	S	Т	A	Р	L	E	E	Historic Structures?	Implemented Quickly?	Lives Saved?	Damage Reduction?	SCORE
with generators and emergency power that can be used as shelters in the event of natural disasters. Equip shelters to connect to generators.												
Objective 2.1: Decrease the impa	ct o	f dis	aste	ers.								
Action 2.1.1: Continue to participate in buyout programs for the highest risk properties located in the highest-risk flood areas.	3	3	3	3	3	3	3	0	2	10	10	43
Action 2.1.2: Continue to participate in the National Flood Insurance Program (NFIP)	3	3	3	3	3	3	3	2	1	10	10	44
Action 2.1.3: Adopt the most current edition of a model building code to address structural and architectural issues related to hazard mitigation.	2	2	2	2	2	2	2	0	0	5	5	24
Action 2.1.4: Consider the construction of detention basins, small lakes, and greenways or riparian corridors to channel and catch storm water, thereby reducing the likelihood of flooding as part of a countywide storm water management plan.	2	2	2	2	2	2	2	0	0	5	5	24
Action 2.1.5: Conduct a public education campaign to inform dam owners and citizens living near the inundation zones of dams about the need to properly maintain and upgrade these structures, particularly those that are more than 50 years old.	2	1	2	2	2	2	2	1	0	5	5	24
Action 2.1.6: Communities that do not currently participate in the National Flood Insurance Plan (NFIP) will consider doing so.	2	2	2	2	2	2	2	2	0	6	8	30
Action 2.1.7: Undertake large-scale buyout of flood prone properties in Rosendale and relocate affected property owners.	3	3	0	3	0	3	3	0	0	10	10	35
Objective 2.2: Decrease the cost of	of th	e ne	ext d	lisas	ster.							
Action 2.2.1: Consider alternative uses for flood-prone areas, such as sports fields, parks, wildlife habitats, etc. and incorporate this in all comprehensive land use plan updates.	2	2	2	2	2	2	2	2	2	5	5	28
Action 2.2.2: Continue to work with SEMA in ongoing buyout program for repetitive loss structures in flood-prone areas.	3	3	3	3	3	3	3	0	2	7	7	37
Action 2.2.3: Amend municipal ordinances	2	1	1	1	2	2	2	0	0	7	5	23

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	S	T	A	Р	L	E	E	Historic Structures?	Implemented Quickly?	Lives Saved?	Damage Reduction?	SCORE
to include a section mandating the building of a wind-resistant shelter with a capacity suitable to handle the expected population in any new trailer park, or park undergoing renovation or expansion.												
Objective 2.3: Increase our econo	omi	e res	sista	nce	to d	lisas	ters	•				
Action 2.3.1: Encourage up-to-date commercial and industrial disaster plans that are coordinated with community disaster plans.	2	1	1	2	2	2	2	0	0	7	5	24
Action 2.3.2: Enact ordinances prohibiting residential and commercial development in all high-hazard prone areas.	2	1	2	1	2	2	2	0	0	7	7	26
Action 2.3.3: Ensure all local governments have the latest copies of flood insurance rate maps, flood plain maps and similar documents.	2	1	2	2	2	2	2	0	1	5	5	24
Action 2.3.4: Maintain and update list of names, phone numbers and duties for all employees during regular operation and off hours.	3	3	3	3	3	3	2	0	1	5	5	31
Action 2.3.5: Follow guidelines as suggested in the Missouri 2002 Drought Plan, developed by MDNR.	2	1	2	2	1	2	2	0	1	5	5	23
Objective 3.1: Increase knowledg disaster safety.	ge a	mon	g ci	tizeı	ns al	bout	t					
Action 3.1.1: Develop an ongoing campaign to educate the community about seasonal hazards by adopting a disaster theme for each season and coordinate this campaign with a variety of promotional resources.	1	2	2	2	2	2	2	2	1	7	6	29
Action 3.1.2: Publish detailed hazard maps on all city and county websites and provide paper copies to the public.	2	1	1	2	2	1	2	2	0	6	6	25
Action 3.1.3: Continue partnerships with the City of Savannah to allow use of cable access channels to broadcast severe weather preparation information.	2	2	1	2	2	2	2	1	2	6	6	28
Action 3.1.4: Educate children in disaster preparedness and how to survive disasters.	3	3	3	3	3	3	2	1	3	10	5	39

Action 3.1.5: Conduct a public education

campaign to inform citizens across the region of the benefits of constructing tornado safe rooms in their homes to reduce

	S	Т	A	Р	L	Е	E	Historic Structures?	Implemented Quickly?	Lives Saved?	Damage Reduction?	SCORE
the potential for loss of life.												
Action 3.1.6: Provide information to media to publish or broadcast emergency information when conditions warrant. Establish contact information with media for night and weekend emergencies.	2	1	1	2	2	2	2	0	1	5	5	23
Action 3.1.7: Encourage businesses and homeowners in flood-prone areas to elevate mechanical systems such as furnaces, water heaters and electrical panels.	2	1	2	2	1	1	2	2	1	5	5	24
Action 3.1.8: Continue and expand public awareness campaigns on hazard preparedness. Involve the Ready in 3 program.	2	2	2	2	2	2	2	0	2	7	5	28
Action 3.1.9: Educate citizens on how to winterize their homes, shut off water valves in case of a pipe burst and prepare for extreme cold.	2	1	1	1	1	2	1	2	1	5	7	24
Action 3.1.10: Citizens that live in areas near timber or tall grass should be encouraged to remove vegetation, yard debris, and other combustible materials that may be near structures.	2	2	2	1	1	2	2	2	0	7	7	28

Objective 4.1: Increase disaster mitigation management capability in local governments.

2	2	3	3	2	2	2	0	2	5	5	28
2	2	2	2	2	1	2	2	1	7	6	29
2	2	2	2	2	1	2	0	1	5	5	24
2	1	1	2	2	1	2	3	0	5	5	24
2	1	1	2	2	1	2	3	0	5	5	24
2	2	2	2	2	1	1	1	1	5	5	24
3	2	2	2	2	3	2	2	1	5	5	29
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	S	Τ	A	Р	L	E	E	Historic Structures?	Implemented Quickly?	Lives Saved?	Damage Reduction?	SCORE
businesses and occupants in hazard areas to participate in mitigation policy formation.												
Action 4.1.8: Inform all city and county department heads and school districts that a disaster mitigation plan exists.	2	1	2	2	2	2	2	0	1	5	5	24
Action 4.1.9: Develop and implement official snow day plans and policies for non-essential personnel.	2	2	2	2	2	2	2	0	0	5	5	24
Action 4.1.10: Update comprehensive land use plans to specifically address development in hazard-prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to hazards.	2	1	2	2	2	2	2	0	1	5	5	24
Action 4.1.11: Promote environmentally sound watershed and storm water practices to decrease flash flooding.	2	1	2	2	3	2	2	0	0	5	5	24
Action 4.1.12: Encourage schools and emergency responders to participate in Electronic Response Information Portal (ERIP).	3	3	2	3	1	2	2	0	1	8	5	30
Action 4.1.13: Obtain data to complete more thorough vulnerability assessments and determine potential losses.	2	2	2	2	2	2	2	0	0	5	5	24
Objective 4.2: Strengthen our crit	tical	infi	rast	ruct	ure	•						
Action 4.2.1: Maintain offsite data back up of county records and plan to safeguard those that do not have back ups.	3	3	3	3	3	3	2	0	0	5	5	30
Action 4.2.2: Encourage electric and telecommunications utilities to anchor or strengthen aboveground transmission lines, poles and similar structures.	2	3	2	3	2	3	2	2	1	8	8	36
Action 4.2.3: Encouraging tree trimming by electric companies may help offset the damages by strong winds breaking tree limbs.	3	3	3	3	3	3	3	3	3	9	9	45
Action 4.2.4: Review, prioritize, institute and monitor needed upgrades or retrofits for critical buildings and infrastructures.	3	2	3	3	3	2	2	1	0	5	5	29
Action 4.2.5: Direct utility providers to assess their facilities, distribution systems, etc. for vulnerability to natural hazards and, if necessary, retrofit or modify them to decrease their vulnerability.	2	2	2	2	0	2	2	2	2	7	7	30
Action 4.2.6: Water and wastewater districts should elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plants.	2	3	2	3	2	3	2	2	1	8	8	36

	S	Τ	A	Р	L	Е	E	Historic Structures?	Implemented Quickly?	Lives Saved?	Damage Reduction?	SCORE
potable water treatment plants and pump stations.												

Evaluation Methods

Each action item must have a quantifiable component to be considered complete or established. The following are the anticipated methods that will be used to determine completeness or if an action item has been effectively established.

Review: The Andrew County commissioners and emergency management director and the emergency management director in-training held a work session to review action items for which they are responsible. The LEPC also reviewed actions they are responsible for and other action items were evaluated by the responsible jurisdictions.

Maps: Maps depicting the hazard or exclusion zone have been completed.

Ordinance: Andrew County has an ordinance template and after adoption of the plan, other jurisdictions will pass ordinances approving the plan.

Reports: A report has been prepared and given to the LEPC and Andrew County.

Records: The proper records have been made and are available for inspection.

Action	Assessment	Future Inclusion
1.1.1	The prerecorded public service announcements have	Action revised
	been posted on the county's website and electronic	
	notification system, not to the media.	
1.1.2	About 1,750 weather radios have been distributed in	Action maintained
	the county since 2005. Radios are for sale at the	
	county clerk's office and promoted through	
	activities, media releases and at weather training.	
1.1.3	Storm shelters continue to be encouraged in new	Action maintained
	buildings.	
1.1.4	Savannah and Country Club Village have zoning	Action maintained
	ordinances and incorporate buffer zones.	
1.1.5	Several shelters have been identified and are	Action maintained
	coordinated with the American Red Cross.	

Assessment

1.1.6	Air conditioners and fans are provided to residents	Action maintained
	who need them through Community Action	
	Partnership.	
1.1.7	EMD continues to provide information to businesses	Action maintained
	and churches.	
1.1.8	The Andrew County Senior Center has been	Action maintained
	designated as a heat wave shelter.	
1.1.9	Offering tax incentives was determined to be	Action eliminated
	unfeasible. However, most new construction has a	
1 1 10	basement or an interior room.	
1.1.10	The courthouse and Savannah's schools are clearly	Action maintained
	marked. Efforts are being made to clearly mark	
1 1 1 1	additional sale areas.	Action maintained
1.1.11	Emergency access and evacuation routes are	Action maintained
	I EPC	
1112	Training is ongoing for Community Response	Action maintained
1.1.14	Teams Not all jurisdictions have offered training	
1 1 1 2	The second is a second strain of the second statistics.	A stien merice I
1.1.13	"Encourage the building of" There are currently no	Action revised
	Legal requirements for mobile home park owners to	
	construct permanent storm shelters	
121	Most all facilities offering public accommodations	Action maintained
1,2,1	have a working NOAA weather radio	
1.2.2	Not all jurisdictions have warning sirens. Mobile	Action maintained
	warning systems are also being considered by some	
	jurisdictions for use at ballparks, etc. that are outside	
	of the warning siren range.	
1.2.3	The wording was changed from "explore" to	Action revised
	"continue" since this action is occurring in Andrew	
	County, Savannah, Country Club Village and the	
	school districts. This action is not practical for the	
	smaller jurisdictions at this time.	
1.2.4	A stronger effort will be placed on acquiring warning	Action maintained
1.2.1	strens for densely populate unincorporated areas.	
1.3.1	Programs are coordinated through a number of	Action maintained
	agencies in the county to help citizens know now to	
132	Personnel and volunteers have received training in	Action maintained
1.3.2	setting up a shelter to accommodate individuals with	Action maintained
	special needs The I FOP addresses this action	
	annually	
1.3.3	Jurisdictions continue to work with Community	Action maintained
1.0.0	Action Partnership and Kansas City Power & Light	

	to help winterize homes.	
1.3.4	The EMD and American Red Cross have a list of	Action maintained
	shelters, those that have generators and those that	
	have the capacity to connect to generators. Since the	
	last plan, four more shelters have installed generators	
	and three more have approved hook-ups.	
2.1.1	The county and most jurisdictions participate with	Action maintained
	SEMA in buyout plans of flood prone properties.	
2.1.2	Jurisdictions will continue to participate in NFIP.	Action maintained
2.1.3	Country Club Village adopted 2009 International	Action maintained
	Building Code.	
2.1.4	The wording was changed from "consider" to	Action revised
	"encourage." The City of Savannah continues to	
215	address flood issues.	
2.1.5	Educational materials are available to the public but	Action maintained
	the risk is minimal. The EMD reviews USDA and	
	USGS dam reports and contacts owners if needed	
216	All jurisdictions are encouraged to participate in the	Action maintained
2.1.0	NFIP	Action maintained
2.1.7	An attempt was made for Rosendale to be bought out	Action revised
2.1.7	and relocated but property owners refused The	riction revised
	wording was changed from "undertake" to	
	"encourage" since the decision is the property	
	owners'.	
2.2.1	Flood prone areas are being gradually bought out, but	Action maintained
	there is still no formal plan for alternative uses.	
2.2.2	Some repetitive loss properties have been bought out.	Action maintained
2.2.3	The Commissioners were removed as a responsible	Action revised
	jurisdiction since they are not involved in municipal	
	ordinances. Currently, mobile home parks are not in	
	County Club Village.	
2.3.1	The LEPC continues to include commercial and	Action maintained
	industrial disaster plans in the LEOP, which is	
	reviewed annually.	
2.3.2	This has not been completed but jurisdictions are still	Action maintained
	considering updating the ordinances.	A (* * 1
2.3.3	Maps are available through county offices.	Action maintained
2.3.4	I ne list is updated annually when the LEOP is	Action maintained
225	The midelines are reviewed arrivally by the DMD	Action maintaired
2.3.5	The guidelines are reviewed annually by the EMD	Action maintained
3.1.1	The EMD provides information to media and	Action maintained
	presentations with a seasonal emphasis on hazards.	
	Information is also available at the annual storm	

	training.	
3.1.2	Maps are posted online and paper copies are	Action maintained
	available at the Andrew County Courthouse.	
3.1.3	Information continues to be posted on public access	Action maintained
	channels, including City of Savannah channel.	
3.1.4	School districts regularly conduct disaster drills and	Action maintained
	educate children. Avenue City works with the	
	County Health Department and American Red Cross,	
	etc.	
3.1.5	Information about tornado safe rooms continues to be	Action maintained
	included in training, classes and presentations by the	
	EMD and other emergency response personnel.	
3.1.6	Information is provided to media as conditions	Action maintained
	warrant.	
3.1.7	Information about elevating mechanical systems	Action maintained
	continues to be included with flood hazard	
210	Information.	A sting as into in a 1
3.1.8	imilar programs advante the public on hererd	Action maintained
	similar programs educate the public on nazard	
	will be a portner in promoting the Ready in 2	
	program	
	program.	
319	Jurisdictions work with Community Action	Action maintained
3.1.9	Jurisdictions work with Community Action Partnership to help residents winterize homes	Action maintained
3.1.9	Jurisdictions work with Community Action Partnership to help residents winterize homes. Wording was changed to "encourage citizens" and	Action maintained
3.1.9 3.1.10	Jurisdictions work with Community Action Partnership to help residents winterize homes. Wording was changed to "encourage citizens" and the priority rank was increased to medium. A	Action maintained Action revised
3.1.9 3.1.10	Jurisdictions work with Community Action Partnership to help residents winterize homes. Wording was changed to "encourage citizens" and the priority rank was increased to medium. A general campaign has not been conducted to inform	Action maintained Action revised
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3.1.9 3.1.10 4.1.1 4.1.2 4.1.3 4.1.4 4.1.5 4.1.6 4.1.7	Jurisdictions work with Community Action Partnership to help residents winterize homes. Wording was changed to "encourage citizens" and the priority rank was increased to medium. A general campaign has not been conducted to inform citizens about removing vegetation from their homes, but properties considered hazards have been addressed. A list of names, contact information, etc. is available in the LEOP and on the Andrew County website. Mutual aid agreements are in place with jurisdictions throughout the county and other counties. The activities of a Mitigation Planning Efforts Coordinator continue to be performed by the EMD. Flood maps are available on the county web site and at the courthouse. The county's GIS information is posted online. The LEPC's web site has been created and is active. The site will be linked with Andrew County's website, under the Emergency Management page. Property owners and the public have been	Action maintained Action revised Action maintained Action maintained Action maintained Action maintained Action maintained Action maintained Action maintained

	planning through public meetings that have been	
	hosted in different locations in the county.	
4.1.8	The hazard mitigation plan is posted online and most	Action maintained
	city and county department heads have participated	
	in the planning process.	
4.1.9	All school districts have snow day policies and more	Action maintained
	work places have started snow day policies.	
4.1.10	The City of Savannah and Country Club Village have	Action maintained
	comprehensive land use plans.	
4.1.11	Savannah still continues working to lessen flash	Action maintained
	flooding.	
4.1.12	ERIP is not widely used and schools and emergency	Action revised
	responders are using a web-based notification	
	system.	
4.1.13	Mo-Kan continues to obtain data to create	Action maintained
	vulnerability assessments.	
4.2.1	The county has offsite back up for all electronic	Action revised
	county records. The action was re-ranked at a higher	
4.2.2		
4.2.2	The county continues working with utility companies	Action maintained
	no encourage strengthening above ground lines,	
	pores, or similar structures.	
423	The county regularly communicates with utility	Action maintained
7.2.5	companies to encourage tree trimming	
4.2.4	Buildings and infrastructure in several jurisdictions	Action maintained
	have been reviewed and some have been replaced.	
	including Andrew County's sheriff office and jail	
	and senior center.	
4.2.5	The wording was changed from "direct" to	Action revised
	"encourage" since it's an ongoing collaborative	
	effort.	
4.2.6	Several water and waste water districts have added	Action revised
	generators and all have procedures in place for power	
	outages during the last revision. Berms are also	
	being encouraged and the priority ranking was	
	moved up to high.	

New Goals

After assessing goals and action items from the original plan, the planning committee discussed new action items. They felt that actions in the 2011 plan adequately covered the county's needs. There had been only minor changes in population, critical infrastructure and construction since the last plan. A number of actions were revised and one new action was proposed.

Social, Technical, Administrative, Political, Legal, Economic and Environmental Criteria	S	Т	A	Р	L	E	E	Historic Structures?	Implemented Quickly?	Lives Saved?	Damage Reduction?	SCORE
New Action Item Consid	ere	ed										
Action 1.1.13: Creation of a community safe room in Rosendale, located at the North Andrew School District.	3	3	3	3	3	2	2	0	0	8	8	35

Strategic Implementation

The goals, objectives, and actions of this plan necessitate group involvement, including individual communities, chambers of commerce and large employers. The action shown above was found to be helpful in saving lives, environmentally sound and technically feasible. The following set of underlying operating principles will improve fiscal and operational efficiency, help maintain a focus on the greater goal of overall community well-being and ensure implementation. The action will be implemented according to the following strategies:

- Incorporate mitigation objectives into existing and future plans, regulations, programs and projects.
- Promote and encourage collaboration between agencies and departments to create a partnership and synergy that result in benefits that would not be possible through a single agency.

- Employ sustainable principles and techniques in the implementation of each objective to attain maximum benefits.
- Create and implement a prioritization process that includes fiscal, environmental and sociological considerations.

Each jurisdiction participating in this multi-jurisdiction plan will seek to fulfill the goals as outlined. In some cases, the jurisdictions will participate together, through involvement in the LEPC, American Red Cross or similar avenues. Other action items will apply only to certain jurisdictions.

In prioritizing mitigation actions, several variables were considered. The benefit-cost review takes into account the monetary and non-monetary costs and benefits associated with each action. The committee examined how many people would be affected by the hazard, how big an area might be affected, how much property damage might occur, as well as the cost of implementing the action. The STAPLEE score for each item was considered. The committee considered the ease of implementation, if the action would result in lives saved and if the action would result in a reduction of disaster damages. Based on these factors, action items were given a priority ranking of high, medium and low. A high priority action is one that would be initiated, if possible, within the next year. A medium priority would be in the next two to three years and low priority would not be addressed immediately.
Goal	Protect our citizens' lives and property.
	Prepare public service announcements and
Astion 111	have ready to be disseminated via the
	electronic notification system during
	emergencies and disasters.
Status	Revised
Hazards Addressed	Drought, Flood, Heat Wave, Severe Winter
	Weather, Thunderstorm, Tornado
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	1
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property.
Action 1.1.2	Inform residents they can purchase weather
	radios to ensure they have sufficient access
	to information in times of disasters.
Status	Ongoing
Hazards Addressed	Drought, Flood, Heat Wave, Severe Winter
	Weather, Thunderstorm, Tornado
Strategy	Prevention, Public Information
Jurisdictions	Andrew County
Responsible Party	Emergency Management Director
Benefit Cost Review	1
Priority Rank	High
Potential Funding	Internal, Private
Estimated Cost	\$15 per radio

Goal	Protect our citizens' lives and property.
Action 1.1.3	Inform the builders that are constructing new public facilities like libraries, community centers, etc. of the benefits of incorporating a safe room.
Status	Ongoing
Hazards Addressed	Thunderstorm, Tornado
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	4
Priority Rank	High

Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property.
Action 1.1.4	Inform the builders that are constructing new public facilities like libraries, community centers, etc. of the benefits of incorporating a safe room.
Status	Ongoing
Hazards Addressed	Thunderstorm, Tornado
Strategy	Prevention
Jurisdictions	Amazonia
Responsible	City Council
Benefit Cost Review	4
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property.
Action 1.1.5	Inform the builders that are constructing
	new public facilities like libraries,
	community centers, etc. of the benefits of
	incorporating a safe room.
Status	Ongoing
Hazards Addressed	Thunderstorm, Tornado
Strategy	Prevention
Jurisdictions	Bolckow
Responsible	City Council
Benefit Cost Review	4
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property.
Action 1.1.6	Inform the builders that are constructing new public facilities like libraries, community centers, etc. of the benefits of incorporating a safe room.
Status	Ongoing
Hazards Addressed	Thunderstorm, Tornado
Strategy	Prevention
Jurisdictions	Savannah

Responsible	City Council
Benefit Cost Review	4
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.7	Incorporate hazard buffer zones into
	subdivision platting regulations.
Status	Ongoing
Hazards Addressed	Dam Failure, Flood, Land Subsidence
Strategy	Prevention
Jurisdictions	Savannah
Responsible	Planning and Zoning
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.8	Incorporate hazard buffer zones into
	subdivision platting regulations.
Status	Ongoing
Hazards Addressed	Dam Failure, Flood, Land Subsidence
Strategy	Prevention
Jurisdictions	Country Club Village
Responsible	Planning and Zoning
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.9	Maintain an up-to-date list of addresses with shelters to assist fire departments and emergency services agencies to locate survivors after a disaster.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather, Tornado, Wildfire

Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.10	Continue program to provide air
	conditioners to those people in the
	community who do not have them and are
	at risk during a heat wave.
Status	Ongoing
Hazards Addressed	Heat Wave
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Grants, Match, Private
Estimated Cost	\$500 per year

Goal	Protect our citizens' lives and property
Action 1.1.11	Work with private entities, such as churches
	and businesses, to encourage the
	construction of tornado shelters in facilities
	where large numbers of people live, work or
	congregate.
Status	Ongoing
Hazards Addressed	Tornado, Thunderstorm
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Internal, Private
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.12	Designate certain air-conditioned facilities
	as heat emergency shelters and encourage

	people without air conditioning to use them
	in a heat wave.
Status	Ongoing
Hazards Addressed	Heat Wave
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal, Private
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.13	Assess existing public facilities for the
	location of suitable safe areas. If available,
	these safe areas should be clearly marked
	and employees and visitors informed of
	their location in public facilities.
Status	Ongoing
Hazards Addressed	Thunderstorm, Tornado
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	LEPC
Benefit Cost Review	1
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.14	Assess existing public facilities for the
	location of suitable safe areas. If available,
	these safe areas should be clearly marked
	and employees and visitors informed of
	their location in public facilities.
Status	Ongoing
Hazards Addressed	Thunderstorm, Tornado
Strategy	Prevention
Jurisdictions	Savannah
Responsible	City Council
Benefit Cost Review	1
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.15	Review emergency access routes and
	evacuation routes and mitigation any
	problem areas.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Severe
	Winter Weather, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.16	Form and train Community Response
	Teams in cities and neighborhood
	associations
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Land Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.17	Inform mobile home park owners of the
	benefits of building a permanent storm
	shelters.
Status	Ongoing
Hazards Addressed	Tornado, Thunderstorm
Strategy	Prevention
Jurisdictions	Andrew County

Responsible	County Commission
Benefit Cost Review	4
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.18	Inform mobile home park owners of the
	benefits of building a permanent storm
	shelters.
Status	Ongoing
Hazards Addressed	Tornado, Thunderstorm
Strategy	Prevention
Jurisdictions	Savannah
Responsible	City Council
Benefit Cost Review	4
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	No cost

Goal	Protect our citizens' lives and property
Action 1.1.19	Creation of a community safe room in
	Rosendale, located at the North Andrew
	School District.
Status	New
Hazards Addressed	Tornado, Thunderstorm
Strategy	Prevention
Jurisdictions	North Andrew School
Responsible	North Andrew School District
Benefit Cost Review	4
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	TBD

Goal	Protect our citizens' lives and property
Action 1.1.20	Safe room for Savannah High School
Status	New
Hazards Addressed	Tornado, Thunderstorm
Strategy	Prevention
Jurisdictions	Savannah R3 School District
Responsible	Savannah R3 School District

Benefit Cost Review	
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500,000.

Goal	Protect our citizens' lives and property
Action 1.1.21	Safe room for John Glenn Elementary
	School
Status	New
Hazards Addressed	Tornado, Thunderstorm
Strategy	Prevention
Jurisdictions	Savannah R3 School District
Responsible	Savannah R3 School District
Benefit Cost Review	
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500,000.

Goal	Protect our citizens' lives and property
Action 1.1.22	Safe room for Minnie Cline Elementary
	School
Status	New
Hazards Addressed	Tornado, Thunderstorm
Strategy	Prevention
Jurisdictions	Savannah R3 School District
Responsible	Savannah R3 School District
Benefit Cost Review	
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500,000.

Goal	Protect our citizens' lives and property
Action 1.1.23	Rosendale Flood Mitigation and Road
	Repair
Status	New
Hazards Addressed	Flooding
Strategy	Preventative and Repair
Jurisdictions	Rosendale
Responsible	City Council
Benefit Cost Review	
Priority Rank	High

Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$400,000

Goal	Provide sufficient warning of impending
	disasters
Action 1.2.1	Inform places of continuous operation that
	offer public accommodations of the
	importance of using a NOAA weather radio.
Status	Ongoing
Hazards Addressed	Flood, Heat Wave, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	1
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Provide sufficient warning of impending
	disasters
Action 1.2.2	Cities that do not have warning systems
	should purchase them.
Status	Ongoing
Hazards Addressed	Flood, Thunderstorm, Tornado
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	LEPC
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$20,000 per siren

Goal	Provide sufficient warning of impending
	disasters
Action 1.2.3	Continue use of electronic methods,
	including Internet, Twitter, texting and
	calling systems to notify public of a hazard.
Status	Revised
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter

	Weather, Thunderstorm, Tornado, Wildfire.
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500 per year

Goal	Provide sufficient warning of impending
	disasters
Action 1.2.4	Continue use of electronic methods,
	including Internet, Twitter, texting and
	calling systems to notify public of a hazard.
Status	Revised
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire.
Strategy	Public Information
Jurisdictions	Amazonia
Responsible	City Council
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500 per year

Goal	Provide sufficient warning of impending
	disasters
Action 1.2.5	Continue use of electronic methods,
	including Internet, Twitter, texting and
	calling systems to notify public of a hazard.
Status	Revised
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire.
Strategy	Public Information
Jurisdictions	Bolckow
Responsible	City Council
Benefit Cost Review	3
Priority Rank	High

Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500 per year

Goal	Provide sufficient warning of impending
	disasters
Action 1.2.6	Continue use of electronic methods,
	including Internet, Twitter, texting and
	calling systems to notify public of a hazard.
Status	Revised
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire.
Strategy	Public Information
Jurisdictions	Country Club Village
Responsible	City Council
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500 per year

Goal	Provide sufficient warning of imponding
Guai	Provide sufficient warning of impending
	disasters
Action 1.2.7	Continue use of electronic methods,
	including Internet, Twitter, texting and
	calling systems to notify public of a hazard.
Status	Revised
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire.
Strategy	Public Information
Jurisdictions	Savannah
Responsible	City Council
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500 per year

Goal	Provide sufficient warning of impending disasters
Action 1.2.8	Continue use of electronic methods, including Internet, Twitter, texting and

	calling systems to notify public of a hazard.
Status	Revised
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire.
Strategy	Public Information
Jurisdictions	Avenue City School
Responsible	Avenue City School District
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500 per year

Goal	Provide sufficient warning of impending disasters
Action 1.2.9	Continue use of electronic methods,
	including Internet, Twitter, texting and
	calling systems to notify public of a hazard.
Status	Revised
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire.
Strategy	Public Information
Jurisdictions	North Andrew School
Responsible	North Andrew School District
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$1,500 per year

Goal	Provide sufficient warning of impending disasters.
Action 1.2.10	Place warning sirens in densely populated unincorporated areas.
Status	Ongoing
Hazards Addressed	Flood, Thunderstorm, Tornado
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	3
Priority Rank	High

Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$20,000 per siren

Goal	Provide sufficient warning of impending disasters.
Action 1.2.11	Place warning siren in Bolckow
Status	New
Hazards Addressed	Tornado, Severe Thunderstorm/Wind Events
Strategy	Prevention
Jurisdictions	Bolckow
Responsible	City Council
Benefit Cost Review	
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$20,000 per siren

Goal	Provide sufficient warning of impending disasters.
Action 1.2.12	Place warning siren in Cosby
Status	New
Hazards Addressed	Tornado, Severe Thunderstorm/Wind Events
Strategy	Prevention
Jurisdictions	Cosby
Responsible	City Council
Benefit Cost Review	
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$20,000 per siren

Goal	Provide sufficient warning of impending disasters.
Action 1.2.13	Place warning siren in Helena
Status	New
Hazards Addressed	Tornado, Severe Thunderstorm/Wind Events
Strategy	Prevention

Jurisdictions	Helena
Responsible	City Council
Benefit Cost Review	
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$20,000 per siren

Goal	Provide sufficient warning of impending disasters.
Action 1.2.14	Place warning siren in Rosendale
Status	New
Hazards Addressed	Tornado, Severe Thunderstorm/Wind Events
Strategy	Prevention
Jurisdictions	Rosendale
Responsible	City Council
Benefit Cost Review	
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match
Estimated Cost	\$20,000 per siren

Goal	Identify the citizens most vulnerable to
	disasters and plan accordingly.
Action 1.3.1	Inform citizens what to do to help elderly
	and disabled friends, neighbors or
	employees.
Status	Ongoing
Hazards Addressed	Flood, Severe Winter Weather, Heat Wave,
	Thunderstorm, Tornado, Wildfire
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Grants, Private, Internal
Estimated Cost	No cost

Goal	Identify the citizens most vulnerable to
	disasters and plan accordingly.
Action 1.3.2	Continue to evaluate accommodating
	individuals with special needs in emergency

	shelters, including compliance with the
	Americans with Disabilities Act (ADA).
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Heat Wave, Thunderstorm, Tornado
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal, Private
Estimated Cost	No cost

Goal	Identify the citizens most vulnerable to disasters and plan accordingly.
Action 1.3.3	Work with organizations and utilities to provide materials and volunteer labor to assist at-risk groups in winterizing their
	homes.
Status	Ongoing
Hazards Addressed	Severe Winter Weather
Strategy	Property Protection
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Grants, Internal, Private
Estimated Cost	\$6,000 to \$7,000 average per home

Goal	Identify the citizens most vulnerable to
	disasters and plan accordingly.
Action 1.3.4	Update inventory of facilities with
	generators and emergency power that can
	be used as shelters in the event of natural
	disasters. Equip shelters to connect to
	generators.
Status	Ongoing
Hazards Addressed	Flood, Severe Winter Weather, Thunderstorm,
	Tornado
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	3

Priority Rank	High
Potential Funding	Grants, Internal, Private
Estimated Cost	No cost

Goal	Decrease the impact of disasters.
Action 2.1.1	Continue to participate in buyout program
	for the highest risk properties located in the
	highest-risk flood areas.
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	Andrew County Commission
Benefit Cost Review	4
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal, Match, Private
Estimated Cost	15% of the cost of the bought out property

Goal	Decrease the impact of disasters.
Action 2.1.2	Continue to participate in the National
	Flood Insurance Program (NFIP).
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention, Property Protection
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal, Federal
Estimated Cost	No cost

Goal	Decrease the impact of disasters.
Action 2.1.3	Continue to participate in the National
	Flood Insurance Program (NFIP).
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention, Property Protection
Jurisdictions	Amazonia
Responsible	City Council
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal, Federal

Estimated Cost	No cost
Goal	Decrease the impact of disasters.

Goal	Decrease the impact of disasters.
Action 2.1.4	Continue to participate in the National
	Flood Insurance Program (NFIP).
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention, Property Protection
Jurisdictions	Bolckow
Responsible	City Council
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal, Federal
Estimated Cost	No cost

Goal	Decrease the impact of disasters.
Action 2.1.5	Continue to participate in the National
	Flood Insurance Program (NFIP).
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention, Property Protection
Jurisdictions	Country Club Village
Responsible	City Council
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal, Federal
Estimated Cost	No cost

Goal	Decrease the impact of disasters.
Action 2.1.6	Continue to participate in the National
	Flood Insurance Program (NFIP).
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention, Property Protection
Jurisdictions	Rosendale
Responsible	City Council
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal, Federal

Estimated Cost	No cost

Goal	Decrease the impact of disasters.
Action 2.1.7	Continue to participate in the National
	Flood Insurance Program (NFIP).
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention, Property Protection
Jurisdictions	Savannah
Responsible	City Council
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal, Federal
Estimated Cost	No cost

Goal	Decrease the impact of disasters
Action 2.1.8	Adopt the most current edition of a model
	building code to address structural and
	architectural issues related to hazard
	mitigation.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Land Subsidence, Severe
	Winter Weather, Thunderstorm, Tornado,
	Wildfire
Strategy	Internal
Jurisdictions	Savannah
Responsible	Planning and Zoning
Benefit Cost Review	3
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost
Goal	Decrease the impact of disasters
Action 2.1.9	Adopt the most current edition of a model
	building code to address structural and
	architectural issues related to hazard
	mitigation.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Land Subsidence, Severe
	Winter Weather, Thunderstorm, Tornado,
	Wildfire
Strategy	Internal
Jurisdictions	Country Club Village

Responsible	City Council
Benefit Cost Review	3
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Decrease the impact of disasters
Action 2.1.10	Construct detention basins, small lakes and
	greenways or riparian corridors to channel
	and catch storm water, thereby reducing the
	likelihood of flooding as part of a
	countywide storm water management plan.
Status	Ongoing
Hazards Addressed	Flood
Strategy	Property Protection
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	3
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Decrease the impact of disasters
Action 2.1.11	Conduct a public education campaign to
	inform dam owners and citizens living near
	the inundation zones of dams about the need
	to property maintain and upgrade these
	structures, particularly those that are more
	than 50 years old.
Status	Ongoing
Hazards Addressed	Dam Failure
Strategy	Internal
Jurisdictions	Andrew County
Responsible	LEPC
Benefit Cost Review	2
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Decrease the impact of disasters.
Action 2.1.12	Communities that do not currently
	participate in the National Flood Insurance

	Program (NFIP) will consider doing so.
Status	Ongoing
Hazards Addressed	Flood
Strategy	Property Protection
Jurisdictions	Cosby
Responsible	City Council
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal, Federal
Estimated Cost	No cost

Goal	Decrease the impact of disasters.
Action 2.1.13	Communities that do not currently
	participate in the National Flood Insurance
	Program (NFIP) will consider doing so.
Status	Ongoing
Hazards Addressed	Flood
Strategy	Property Protection
Jurisdictions	Fillmore
Responsible	City Council
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal, Federal
Estimated Cost	No cost

Goal	Decrease the impact of disasters.
Action 2.1.14	Communities that do not currently participate in the National Flood Insurance Program (NEIP) will consider doing so
Status	Ongoing
Hazards Addressed	Flood
Strategy	Property Protection
Jurisdictions	Rea
Responsible	City Council
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Internal, Federal
Estimated Cost	No cost

Goal	Decrease the impact of disasters.
Action 2.1.15	Encourage large-scale buyout of flood-prone
	properties in Rosendale and relocate

	affected property owners.
Status	Revised
Hazards Addressed	Flood
Strategy	Property Protection
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	4
Priority Rank	High
Potential Funding	Federal, State
Estimated Cost	No cost

Goal	Decrease the cost of the next disaster.
Action 2.2.1	Consider alternative uses for flood-prone areas, such as sports fields, parks, wildlife habitats, etc. and incorporate this in all comprehensive land use plan updates.
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention, Natural Resources
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	3
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Decrease the cost of the next disaster.
Action 2.2.2	Continue to work with SEMA in ongoing
	buyout program for repetitive loss
	structures in flood-prone areas.
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention, Property Protection
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Grants, Internal, State, Federal
Estimated Cost	No cost

Goal	Decrease the cost of the next disaster.
Action 2.2.3	Amend municipal ordinances to include a

	section mandating the building of a wind- resistant shelter with a capacity to handle the expected population in any new mobile home park or park undergoing renovation or expansion.
Status	Ongoing
Hazards Addressed	Tornado, Thunderstorm
Strategy	Prevention
Jurisdictions	Savannah
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase our economic resistance to disasters.
Action 2.3.1	Maintain up-to-date commercial and
	industrial disaster plans that are
	coordinated with community disaster plans.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Land Subsidence, Severe
	Winter Weather, Thunderstorm, Tornado,
	Wildfire
Strategy	Emergency Services, Public Information
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Low
Potential Funding	Internal, Private
Estimated Cost	No cost

Goal	Increase our economic resistance to disasters.
Action 2.3.3	Enact ordinances prohibiting residential
	and commercial development in all high-
	hazard prone areas.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Land Subsidence, Severe
	Winter Weather, Thunderstorm, Tornado,
	Wildfire
Strategy	Property Protection
Jurisdictions	Savannah
Responsible	Planning and Zoning
Benefit Cost Review	2

Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase our economic resistance to disasters.
Action 2.3.4	Enact ordinances prohibiting residential
	and commercial development in all high-
	hazard prone areas.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Land Subsidence, Severe
	Winter Weather, Thunderstorm, Tornado,
	Wildfire
Strategy	Property Protection
Jurisdictions	Country Club Village
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase our economic resistance to disasters.
Action 2.3.5	Ensure all local governments have the latest
	copies of flood insurance rate maps, flood
	plain maps and similar documents.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Wildfire
Strategy	Property Protection
Jurisdictions	Andrew County
Responsible	Planning and Zoning
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase our economic resistance to disasters.
Action 2.3.6	Maintain and update lists of names, phone
	numbers and duties for all emergency
	service employees during regular operation
	and off hours.
Status	Ongoing

Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	1
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase our economic resistance to disasters.
Action 2.3.7	Follow guidelines as suggested in the
	Missouri 2002 Drought Plan, developed by
	MDNR.
Status	Ongoing
Hazards Addressed	Drought
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Low
Potential Funding	Grants, Internal
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.1	Develop an ongoing campaign to educate
	the community about seasonal hazards by
	adopting a disaster theme for each season
	and coordinate this campaign with a variety
	of promotional resources.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal, Private
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.2	Publish detailed hazards maps on city and
	county websites and provide paper copies to
	the public.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	Mo-Kan Regional Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.3	Continue partnerships with City of
	Savannah to allow use of cable access
	channels to broadcast severe weather
	preparation information.
Status	Ongoing
Hazards Addressed	Drought, Flood, Heat Wave, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire.
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	1
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.4	Educate children in disaster preparedness
	and how to survive disasters.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado

Strategy	Public Information
Jurisdictions	Avenue City School
Responsible	Superintendent
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Grants, Internal
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.5	Educate children in disaster preparedness
	and how to survive disasters.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Public Information
Jurisdictions	North Andrew School
Responsible	Superintendent
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Grants, Internal
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.6	Educate children in disaster preparedness
	and how to survive disasters.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Public Information
Jurisdictions	Savannah School
Responsible	Superintendent
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Grants, Internal
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.7	Conduct a public education campaign to
	inform citizens of the benefits of

	constructing tornado safe rooms in their homes to reduce the potential for loss of life.
Status	Ongoing
Hazards Addressed	Tornado, Thunderstorm
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Grants, Internal
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.8	Provide information to media to publish or
	broadcast emergency information when
	conditions warrant. Establish contact
	information with media for night and
	weekend emergencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Private
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.9	Inform businesses and homeowners in flood-
	prone areas to elevate mechanical systems
	such as furnaces, water heaters and
	electrical panels.
Status	Ongoing
Hazards Addressed	Flood
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	LEPC
Benefit Cost Review	1

Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase knowledge among citizens about disaster safety
Action 3.1.10	Continue and expand public awareness campaigns on hazard preparedness. Involve
	the Ready-in-3 program.
Status	Ongoing
Hazards Addressed	Flood, Earthquake, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	Andrew County Health Department
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Grants, Internal, Private
Estimated Cost	No cost

Goal	Increase knowledge among citizens about
	disaster safety.
Action 3.1.11	Educate citizens on how to winterize their
	homes, shut off water valves in case a pipe
	bursts and prepare for extreme cold.
Status	Ongoing
Hazards Addressed	Severe Winter Weather
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Grants, Internal, Private
Estimated Cost	No cost

Goal	Increase knowledge among citizens about disaster safety.
Action 3.1.12	Inform citizens that live in areas near timber or tall grass to remove vegetation, yard debris and other combustible materials that may be near structures.

Status	Revised
Hazards Addressed	Wildfire
Strategy	Prevention, Natural Resources
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
Obai	mercase disaster initigation management
	ability in local governments.
Action 4.1.1	Maintain a publicly accessible list of names,
	position, contact information, roles and
	responsibilities for all public safety positions
	and departments.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	1
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.2	Execute and maintain mutual aid
	agreements with all relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	LEPC
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.3	Execute and maintain mutual aid
	agreements with all relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Amazonia
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management ability in local governments.
Action 4.1.4	Execute and maintain mutual aid
	agreements with all relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Bolckow
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.5	Execute and maintain mutual aid
	agreements with all relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services

Jurisdictions	Cosby
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.6	Execute and maintain mutual aid
	agreements with all relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Country Club Village
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management ability in local governments
Action 4.1.7	Execute and maintain mutual aid
	agreements with all relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Fillmore
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.8	Execute and maintain mutual aid

	agreements with all relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Rea
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.9	Execute and maintain mutual aid
	agreements with all relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Rosendale
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
Action 4.1.10	Execute and maintain mutual aid
	agreements with an relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Savannah
Responsible	City Council
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.11	Execute and maintain mutual aid
	agreements with all relevant agencies.
Status	Ongoing
Hazards Addressed	Dam Failure, Earthquake, Flood, Land
	Subsidence, Severe Winter Weather,
	Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Rosendale Fire Protection District
Responsible	Rosendale Fire Chief
Benefit Cost Review	2
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.12	Incorporate mitigation planning efforts
	coordinator with duties of emergency
	management director.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	LEPC

Benefit Cost Review	3
Priority Rank	Low
Potential Funding	Internal, State, Federal
Estimated Cost	No cost

Goal	Increase disaster mitigation management ability in local governments.
Action 4.1.13	Develop an accurate countywide series of maps detailing flood, plain, flash flood danger zones, land subsidence susceptible areas and process this information within a Geographic Information System.
Status	Ongoing
Hazards Addressed	Flood, Land Subsidence
Strategy	Property Protection, Prevention, Natural Resources
Jurisdictions	Andrew County
Responsible	Planning and Zoning
Benefit Cost Review	2
Priority Rank	Low
Potential Funding	Grants, Internal, State, Federal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.14	Make all GIS hazard information available
	online to county and municipal permitting
	departments through the Hazard Mitigation
	Plan.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Property Protection, Public Information
Jurisdictions	Andrew County
Responsible	Planning and Zoning
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Grants, Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
Action 4.1.15	Maintain the web site for the Local
	Emergency Planning Committee.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	LEPC
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Grants, Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management ability in local governments.
Action 4.1.16	Inform property owners, business and occupants in hazard areas about participating in mitigation policy formation.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood, Heat Wave, Land Subsidence, Severe Winter Weather, Thunderstorm, Tornado, Wildfire
Strategy	Public Information
Jurisdictions	Andrew County
Responsible	Mo-Kan Regional Council
Benefit Cost Review	1
Priority Rank	Medium
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.17	Inform all city and county department
	heads and school districts that a disaster
	mitigation plan exists.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Heat Wave, Land Subsidence, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Public Information

Jurisdictions	Andrew County
Responsible	Mo-Kan Regional Council
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.18	Develop and implement official snow day
	plans and policies for non-essential
	personnel.
Status	Ongoing
Hazards Addressed	Severe Winter Weather
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	Andrew County Commission
Benefit Cost Review	3
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.19	Develop and implement official snow day
	plans and policies for non-essential
	personnel.
Status	Ongoing
Hazards Addressed	Severe Winter Weather
Strategy	Prevention
Jurisdictions	Savannah
Responsible	City Council
Benefit Cost Review	3
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.20	Update comprehensive land use plans to
	specifically address development in hazard-
	prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to
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	hazards.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Land Subsidence, Wildfire
Strategy	Prevention
Jurisdictions	Savannah, Country Club
Responsible	Planning and Zoning
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management ability in local governments.
Action 4.1.21	Update comprehensive land use plans to specifically address development in hazard- prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to hazards.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood,
	Land Subsidence, Wildfire
Strategy	Prevention
Jurisdictions	Savannah
Responsible	Planning and Zoning
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management ability in local governments.
Action 4.1.22	Update comprehensive land use plans to specifically address development in hazard- prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to hazards.
Status	Ongoing
Hazards Addressed	Dam Failure, Drought, Earthquake, Flood, Land Subsidence, Wildfire
Strategy	Prevention

Jurisdictions	Country Club Village
Responsible	City Council
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
Action 4.1.23	Engage in environmentally sound watershed and storm water practices to decrease flash
Status	Ongoing
Hazards Addressed	Flood
Strategy	Natural Resources
Jurisdictions	Andrew County
Responsible	Planning and Zoning
Benefit Cost Review	1
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Increase disaster mitigation management
	ability in local governments.
Action 4.1.24	Implement web-based notification system
	for emergency responders.
Status	Revised
Hazards Addressed	Earthquake, Flood, Tornado
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	Emergency Management Director
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Grants, Internal
Estimated Cost	\$800 per year

Goal	Increase disaster mitigation management ability in local governments.
Action 4.1.25	Obtain data to complete more thorough vulnerability assessments and determine

	potential losses.
Status	New
Hazards Addressed	Earthquake, Flood, Tornado, Dam Failure,
	Drought, Heat Wave, Land Subsidence, Severe
	Winter Weather, Thunderstorm, Wildfire
Strategy	Emergency Services
Jurisdictions	Andrew County
Responsible	Mo-Kan Regional Council
Benefit Cost Review	2
Priority Rank	Low
Potential Funding	Internal
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.1	Maintain offsite data back up of county
	records and plan to safeguard those that do
	not have back ups.
Status	Revised
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.2	Work with electric and telecommunications
	utilities to anchor or strengthen above
	ground transmission lines, poles or similar
	structures.
Status	Ongoing
Hazards Addressed	Dam Failure, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Property Protection
Jurisdictions	Andrew County
Responsible	LEPC
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Private, Internal
Estimated Cost	Widely varies

Goal	Strengthen our critical infrastructure
Action 4.2.3	Work with electric companies to conduct
	tree trimming in order to offset damages
	from breaking limbs.
Status	Ongoing
Hazards Addressed	Severe Winter Weather, Thunderstorm,
	Tornado
Strategy	Property Protection
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	2
Priority Rank	High
Potential Funding	Private, Internal
Estimated Cost	\$300-\$500 per tree

Goal	Strengthen our critical infrastructure
Action 4.2.4	Review, prioritize, institute and monitor
	needed upgrades and retrofits for critical
	buildings and infrastructures.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Property Protection
Jurisdictions	Andrew County
Responsible	Planning and Zoning
Benefit Cost Review	4
Priority Rank	Medium
Potential Funding	Internal, Grants
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.5	Review, prioritize, institute and monitor
	needed upgrades and retrofits for critical
	buildings and infrastructures.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Property Protection
Jurisdictions	Amazonia
Responsible	City Council
Benefit Cost Review	4

Priority Rank	Medium
Potential Funding	Internal, Grants
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.6	Review, prioritize, institute and monitor
	needed upgrades and retrofits for critical
	buildings and infrastructures.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Property Protection
Jurisdictions	Country Club Village
Responsible	City Council
Benefit Cost Review	4
Priority Rank	Medium
Potential Funding	Internal, Grants
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.7	Review, prioritize, institute and monitor needed upgrades and retrofits for critical buildings and infrastructures.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Property Protection
Jurisdictions	Savannah
Responsible	City Council
Benefit Cost Review	4
Priority Rank	Medium
Potential Funding	Internal, Grants
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.8	Review, prioritize, institute and monitor
	needed upgrades and retrofits for critical
	buildings and infrastructures.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Property Protection

Jurisdictions	Avenue City School
Responsible	School Board
Benefit Cost Review	4
Priority Rank	Medium
Potential Funding	Internal, Grants
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.9	Review, prioritize, institute and monitor
	needed upgrades and retrofits for critical
	buildings and infrastructures.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Property Protection
Jurisdictions	North Andrew School
Responsible	School Board
Benefit Cost Review	4
Priority Rank	Medium
Potential Funding	Internal, Grants
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.10	Review, prioritize, institute and monitor
	needed upgrades and retrofits for critical
	buildings and infrastructures.
Status	Ongoing
Hazards Addressed	Earthquake, Flood, Severe Winter Weather,
	Thunderstorm, Tornado
Strategy	Property Protection
Jurisdictions	Savannah School
Responsible	School Board
Benefit Cost Review	4
Priority Rank	Medium
Potential Funding	Internal, Grants
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.11	Work with utility providers to assess their
	facilities, distribution systems, etc. for
	vulnerability to natural hazards and if
	necessary, retrofit or modify them to

	decrease their vulnerability.
Status	Revised
Hazards Addressed	Drought, Earthquake, Flood, Severe Winter
	Weather, Thunderstorm, Tornado, Wildfire
Strategy	Property Protection
Jurisdictions	Andrew County
Responsible	County Commission
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Internal
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.12	Water and wastewater districts should
	elevate vulnerable equipment, electrical
	controls and other equipment at wastewater
	treatment plants, potable water treatment
	plants and pump stations.
Status	Revised
Hazards Addressed	Drought, Earthquake, Flood, Severe Winter
	Weather, Thunderstorm, Tornado
Strategy	Prevention
Jurisdictions	Andrew County
Responsible	LEPC
Benefit Cost Review	3
Priority Rank	High
Potential Funding	Private, Internal
Estimated Cost	No cost

Goal	Strengthen our critical infrastructure
Action 4.2.13	Water and wastewater districts should
	elevate vulnerable equipment, electrical
	controls and other equipment at wastewater
	treatment plants, potable water treatment
	plants and pump stations.
Status	Revised
Hazards Addressed	Drought, Earthquake, Flood, Severe Winter
	Weather, Thunderstorm, Tornado
Strategy	Prevention
Jurisdictions	Savannah
Responsible	City Council
Benefit Cost Review	3
Priority Rank	High

Potential Funding	Private, Internal
Estimated Cost	No cost

Ensure Implementation Through Inclusion in Adoption Resolution

The Andrew County Natural Hazard Mitigation Plan will be implemented under the direction of the Andrew County Commission, the governing body of each municipality and school district, the regional planning council, a variety of intergovernmental committees, private agencies, non-governmental cooperatives and each of their respective staffs. The implementation process will include coordination among county and municipal departments and other relevant agencies or districts through the county's Emergency Management Agency. The county will set up a system to monitor progress and evaluate the effectiveness of implemented actions with revisions as needed.

Plan Maintenance

The plan maintenance section of this document details the formal process that will ensure that the Andrew County Hazard Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the plan annually and producing a plan revision every five years. This section describes how the county will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how Andrew County governments intend to incorporate the mitigation strategies outlined in this plan into existing planning mechanisms such as the county Local Emergency Operations Plan, the Comprehensive Economic Development Strategy (CEDS), and floodplain management.

The results of this five-year review will be summarized in a report prepared for this mitigation plan under direction of the Andrew County Emergency Management Director and the LEPC. The report will include an evaluation of the effectiveness and appropriateness of the plan, and will recommend, as appropriate, any required changes or amendments to the plan. The planning committee directed to review the plan shall be composed of representatives from various governmental agencies, county officials, city employees, school district personnel, utility service employees, emergency responders and planners, regional planners and any concerned county residents. The committee shall be established when the five-year review period approaches and will meet as necessary to discuss mitigation updates.

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Upon meeting, the committee members will also report on the status of their assigned projects. The Hazard Mitigation Committee should update the plan and submit it to the committee members and State Hazard Mitigation Officer.

Plan Adoption

The Andrew County Commission will be responsible for adopting the Andrew County Hazard Mitigation Plan. This governing body has the authority to promote sound public policy regarding natural hazards. Once the plan has been adopted, the County Emergency Management Director will be responsible for submitting it to the State Hazard Mitigation Officer at Missouri State. Missouri State Emergency Management will then submit the plan to the Federal Emergency Management Agency (FEMA) for review. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, Andrew County will continue eligibility for Hazard Mitigation Grant Program funds.

Monitoring, Evaluating and Updating

Periodic revisions and updates of the plan are required by Missouri SEMA to ensure that the goals and objectives for Andrew County and its jurisdictions are kept current. More importantly, revisions may be necessary to ensure the plan is in full compliance with federal regulations and state statutes. This portion of the plan outlines the procedures for completing such revisions and updates.

Five Year Plan Review

This hazard mitigation plan and its goals and objectives should be reviewed every five years to determine if there have been any significant changes in Andrew County or mitigation methods that would affect the Hazard Mitigation Plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques, and changes to federal or state legislation are examples of changes that may affect the condition of the plan. Further, following a disaster declaration, the plan will need to be revised to reflect on lessons learned or to address specific circumstances arising out of the disaster. The next review is anticipated to begin in 2020.

At that time, the planning committee will be formed with representatives from participating jurisdictions. The committee will review information in the plan, hazard analysis

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and mitigation goals. The public will be invited to participate in the process through a series of public meetings.

The planning committee will update information on community profiles, hazards and historical data, capabilities and vulnerabilities. Development trends and patterns will also be considered in the review process.

The committee will then review what goals have been achieved, which goals are still ongoing and which ones are no longer applicable.

The updated plan will be submitted for SEMA/FEMA approval. A copy of the adoption resolution template is included in Appendix A. Each jurisdiction will participate in revising the plan and then adopt the plan after it is approved by Andrew County. In addition, the plan will be reviewed for any necessary updates following any major disasters that occur within the county.

Implementation Through Existing Programs

Andrew County addresses regional planning and economic goals through its CEDS with Mo-Kan Regional Council. The hazard mitigation plan provides a series of recommendations – several of which are closely related to the goals and objectives of existing planning programs. Andrew County will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

Upon adoption, the Andrew County Hazard Mitigation Plan will serve as a baseline of information on the natural hazards that impact the county and each of its cities. These goals and objectives will help local governments and other organizations plan for natural hazard mitigation in their own planning documents. Within two years of formal adoption of the mitigation plan, the recommendations listed above should be incorporated into the process of existing planning mechanisms at the county level.

The community of Savannah seeks to implement aspects of the hazard mitigation plan into their comprehensive land use plan, building codes, zoning and flood plain management. County Club Village seeks to implement aspects of the hazard mitigation into their comprehensive land use plan, zoning and building codes. Both communities have very small city staff and mitigation implementation will be led by their city councils.

The smaller communities of Amazonia, Bolckow, Cosby, Fillmore, Rea and Rosendale have limited options for integrating the hazard mitigation plan into existing programs and plans

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(see Figure 3.19). These communities have no full-time staff and largely lack comprehensive land use plans, zoning regulations, etc. They will heavily rely on county and LEPC resources in their mitigation efforts and their city councils will initiate mitigation efforts.

The three school districts have an emergency plan that the hazard mitigation plan will be incorporated into. In addition, North Andrew School District will coordinate with Rosendale to make their safe room (upon its completion) available to the community during inclement weather.

The meetings of the LEPC and Hazard Mitigation Planning Committee will provide an opportunity for committee members to report back on the progress made on the integration of mitigation planning elements into county/city planning documents and procedures.

Continued Public Involvement

Andrew County is dedicated to involving the public directly in review and updates of the plan. The LEPC and the Hazard Mitigation Planning Committee members are responsible for reviewing and updating the plan. The public will also have the opportunity to provide feedback. Copies will be catalogued and kept at all of the appropriate agencies in the county. A public meeting will also be held after each five-year evaluation or when deemed necessary by the Hazard Mitigation Planning Committee. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas. The county will be responsible for publicizing the meetings and maintaining public involvement through the public access channel, webpage and newspapers.

Appendix A: Adoption Resolutions

Andrew County, Missouri

RESOLUTION NO. AC 04/2016

A RESOLUTION OF THE ANDREW COUNTY COMMISSIONER'S ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the Andrew County Commissioner's recognizes the threat that natural hazards pose to people and property within the County of Andrew; and

WHEREAS the Andrew County Commissioner's have participated in the preparation of a multi hazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan is in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the County of Andrew from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to the County of Andrew for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the County of Andrew recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the County of Andrew will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the Andrew County Commissioner's demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE ANDREW COUNTY COMMISSIONER'S, in the State of Missouri, THAT:

Section 1. In accordance with (*local rule for adopting resolutions*), the Andrew County Commissioner's adopts the Plan.

ADOPTED by a vote of β in favor and \Diamond against and \Diamond abstaining this 11th day of April 2016.
By (Sig): Bor Calched Pres. Comm-
Print name: Bob Caldwell
By (Sig): Daught Howard
Print name: Darry 1 Howard
By (Sig): Rac Buf
Print name: Ray Furst
ATTEST:
By (Sig.): Data Miller
Print name: SARAH MITLLER
APPROVED AS TO FORM;
By (Sig.):
Print name:

The City of Amazonia, Missouri

RESOLUTION NO. 6-6-16

A RESOLUTION OF THE City of Amazonia ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the City of Amazonia, recognizes the threat that natural hazards pose to people and property within the City of Amazonia; and

WHEREAS the City of Amazonia, has participated in the preparation of a multihazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan 6-6-16 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Amazonia, from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to The City of Amazonia, for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the City of Amazonia, recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the City of Amazonia, will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the City of Amazonia, demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE City of Amazonia, in the State of Missouri, THAT:

Section 1. In accordance with The City of Amazonia, the City of Amazonia, adopts the Plan.

ADOPTED by a vote of 4 in favor and 6 against, and 0 abstaining, this 4 against day of

_, 2016 June By (Sig): MAN or Print name:

ATTEST:

By (Sig.): athan Print name:

APPROVED AS TO FORM: By (Sig.) Print name: Um Soat

City of Bolckow, MIssouri

Ordinance NO. ____230____

An Ordinance OF THE The City of Bolckow, Missouri ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016) shall be monitored, evaluated, updated and resubmitted to this governing body for re-adoption periodically (at least) every five years from the date of the last adoption

WHEREAS the *City of Bolckow, Missouri* recognizes the threat that natural hazards pose to people and property within the City of Bolckow, Missouri; and

WHEREAS the *City of Bolckow*, Missouri has participated in the preparation of a multihazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (*hereafter referred to as the Plan*) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the *City of Bolckow, Missouri* from the impacts of future hazards and disasters; and

WHEREAS the *City of Bolckow, Missouri* recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the *City of Bolckow*, Missouri will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the *City of Bolckow, Missouri* demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT ORDAINED BY THE City of Bolckow, Missouri in the State of Missouri, THAT:

Section 1. In accordance with *local rule for adopting ordinances The City of Bolckow, Missouri* adopts the Plan ADOPTED by a vote of _3____ in favor and ____0_ against, and __0__ abstaining, this 10th day of May 2016

By (Sig): Print name: ATTEST: By (Sig.): AldERMAN Print name APPROVED AS TO FORM: By (Sig.): Print name: Ae

VILLAGE OF COSBY, COSBY, Missouri

RESOLUTION NO. 16 - 1

A RESOLUTION OF THE Village of Cosby ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the Village of Cosby recognizes the threat that natural hazards pose to people and property within the Village of Cosby; and

WHEREAS the Village of Cosby has participated in the preparation of a multi-hazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (hereafter referred to as the Plan) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Village of Cosby from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to Village of Cosby for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the Village of Cosby recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Village of Cosby will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the Village of Cosby demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE VILLAGE OF COSBY, in the State of Missouri, THAT:

Section 1. In accordance with (local rule for adopting resolutions), the Village of Cosby adopts the Plan.

ADOPTED by a vote of $\underline{4}$ in favor and $\underline{0}$ against, and $\underline{0}$ abstaining, this $\underline{2}^{\underline{hc}}$ day of May 2016 lohney. By (Sig): 🛌 ${\mathcal D}$ Print name: Johnney ATTEST: By (Sig.): 🤇 Print name: 121280 APPROVED AS TO FORM: By (Sig.): Print name:

A RESOLUTION ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016) BY THE VILLAGE OF COUNTRY CLUB, MISSOURI

WHEREAS, the Village of Country Club, Missouri recognizes the threat that natural hazards pose to people and property within the Village of Country Club, Missouri

WHEREAS, the Village of Country Club has participated in the preparation of a multihazard migration plan, hereby known as the Andrew County Hazard Mitigation Plan (hereafter referred to as the Plan) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Village of Country Club, Missouri from impacts of future hazards and disaster; and

WHEREAS, the Plan shall be monitored, evaluated, updated and resubmitted to the Village of Country Club, Missouri for re-adoption (at least) every five years from the date of the last adoptions; and

WHEREAS, The Village of Country Club, Missouri recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Village of Country Club, Missouri will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS, Adoption by the Village of Country Club, Missouri demonstrates their

commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE VILLAGE OF COUNTRY CLUB as follows

Adopted this 12th day of April, 2016, by the Board of Trustees of the Village of Country Club, Missouri.

Cavelyn R. Clynnin Carolyn Clemens,

Carolyn Clemens, Chairman of the Board of Trustees

Attest: Chamley Village Clerk

City of Fillmore, Missouri

RESOLUTION NO. 180

A RESOLUTION OF THE CITY OF FILLMORE, MO ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the City of Fillmore recognizes the threat that natural hazards pose to people and property within the city of Fillmore; and

WHEREAS the City of Fillmore has participated in the preparation of a multi-hazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (*hereafter referred to as the Plan*) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Fillmore from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to City of Fillmore for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the City of Fillmore recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the City of Fillmore will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the City of Fillmore demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF FILLMORE, in the State of Missouri, THAT:

Section 1. In accordance with resolution adoption rules, the City of Fillmore adopts the Plan.

ADOPTED by a vote of -3 in favor and \bigcirc against, and \bigcirc abstaining, this 3rd day of

May, 2016. By:

Print name: THOMAS Coa

ATTEST By: more, Clark lerry Print name:

APPROVED AS TO FORM:

By :		
~	the second secon	

Print name:

RESOLUTION NO. 10

A RESOLUTION OF THE VILLAGE OF REA ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS *the Village of Rea* recognizes the threat that natural hazards pose to people and property within the Village of Rea; and

WHEREAS *the Village of Rea* has participated in the preparation of a multihazard mitigation plan, hereby known as the Andrew County Hazard Mitigation plan (hereafter referred to as the Plan) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the *Village of Rea* from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to the *Village of Rea* for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the *Village of Rea* recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the *Village of Rea* will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the *Village of Rea* demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE VILLAGE OF REA, in the state of Missouri, THAT:

Section 1. In accordance with the Board of Councilmen, the Village of Rea adopts the Plan. ADOPTED by a vote of b_{1} in favor and b_{2} against, and b_{2} abstaining this 4 day of

MAU . 20110 ByKINNI 1EE Print Name KENNET ATTEST: By Kathin Print Name Kathy Roach APPROVED AS TO FORM:

By:

Print Name:_____

City of Rosendale, Missouri

RESOLUTION NO. 2016

WHEREAS the City of Rosendale recognizes the threat that natural hazards pose to people and property within the City of Rosendale.

WHEREAS the City of Rosendale has participated in the preparation of a multihazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (hereafter referred to as the Plan) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Rosendale from the impacts of the future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to the City of Rosendale for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the City of Rosendale recognizes that the land use policies have a major impact on whether people and property are exposed to natural hazards, the City of Rosendale will endeavor to intergate the Plan into the comprehensive planning process and

WHEREAS adoption by the City of Rosendale demonstrates their commitment to hazard mitigation and achieving goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY, the City of Rosendale, in the State of Missouri, THAT:

Section 1. In accordance with the local rule for adopting resolutions, the City of Rosendale adopts the Plan.

Adopted by a vote of $\underline{\underline{H}}$ in favor and $\underline{\underline{}}$ against, and $\underline{\underline{}}$ abstaining, this $\underline{\underline{q}}^{+h}$ day of

By (Sig): Print namé

ATTEST:

By (Sig): _// Print name:

APPROVED AS TO FORM:

Print name:

RESOLUTION NO. 2016-2

A RESOLUTION OF THE CITY OF SAVANNAH, MISSOURI ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the City of Savannah, Missouri recognizes the threat that natural hazards pose to people and property within the City of Savannah; and

WHEREAS the City of Savannah has participated in the preparation of a multi-hazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (*hereafter referred to as the Plan*) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Savannah from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to City of Savannah for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS City of Savannah recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, City of Savannah will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the City of Savannah demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE Board of Aldermen of the City of Savannah, in the State of Missouri, THAT:

PASSED AND APPROVED this 18 day of George

Connie George, Mayor

ATTEST:

Beth Kan

Beth Kar, City Clerk

Avenue City R-IX School District, Andrew County, Missouri

RESOLUTION NO. __2016-4-11____

A RESOLUTION OF THE AVENUE CITY R-IX SCHOOL DISTRICT ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the Avenue City R-IX School District recognizes the threat that natural hazards pose to people and property within the Avenue City R-IX School District; and

WHEREAS the Avenue City R-IX School District has participated in the preparation of a multihazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (*hereafter referred to as the Plan*) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Avenue City R-IX School District from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to the Avenue City R-IX School District for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the Avenue City R-IX School District recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Avenue City R-IX School District will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the Avenue City R-IX School District demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE AVENUE CITY R-IX SCHOOL DISTRICT, IN THE STATE OF MISSOURI, THAT:

Section 1. In accordance with District Policy 0310, the Avenue City R-IX School District adopts the Plan,

ADOPTED by a vote of _7_ in favor and _0_ against, and _0_ abstaining, this 11th day of April, 2016.

Print name: Rodney Davison, President

ATTEST:

By (Sig.): Print name: Janice Pankau, Board Secretary

APPROVED AS TO FORM:

By (Sig.):_____

Print name:

NORTH ANDREW R-VI SCHOOL DISTRICT, Missouri

RESOLUTION NO.

A RESOLUTION OF THE NORTH ANDREW R-VI SCHOOL DISTRICT ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the NORTH ANDREW R-VI SCHOOL DISTRICT recognizes the threat that natural hazards pose to people and property within the NORTH ANDREW R-VI SCHOOL DISTRICT; and

WHEREAS the NORTH ANDREW R-VI SCHOOL DISTRICT has participated in the preparation of a multihazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (*hereafter referred to as the Plan*) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the NORTH ANDREW R-VI SCHOOL DISTRICT from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to NORTH ANDREW R-VI SCHOOL DISTRICT for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the NORTH ANDREW R-VI SCHOOL DISTRICT recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the (*local governing body*) will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the NORTH ANDREW R-VI SCHOOL DISTRICT demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE NORTH ANDREW R-VI SCHOOL DISTRICT, in the State of Missouri, THAT:

Section 1. In accordance with (*local rule for adopting resolutions*), the NORTH ANDREW R-VI SCHOOL DISTRICT adopts the Plan.

ADOPTED by a vote of b in favor and b against, and b abstaining, this 15 day of

By (Sig): Board the sident Print name: < ATTEST: By (Sig.): Print name: APPROVED AS TO FORM: By (Sig.):

Print name:

A RESOLUTION OF THE SAVANNAH R III SCHOOL DISTRICT ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the Savannah R III School District recognizes the threat that natural hazards pose to people and property within the Savannah R III School District; and

WHEREAS the Savannah R III School District has participated in the preparation of a multi-hazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (*hereafter referred to as the Plan*) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Savannah R III School District from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to Savannah R III School District for readoption (at least) every five years from the date of the last adoption; and

WHEREAS the Savannah R III School District recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Savannah R III School District will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the Savannah R III School District demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE SAVANNAH R III SCHOOL DISTRICT in the State of Missouri, THAT:

Section 1. The Savannah R III School District adopts the Plan.

ADOPTED by a vote of $\underline{7}$ in favor and $\underline{0}$ against, and $\underline{0}$ abstaining, this $\underline{10}$ day of

May ,201 By (Sig): Daviel Print name;

ATTEST: By (Sig.): Print name:

APPROVED AS TO FORM:

By (Sig.):

Print name:

ROSENDALE FIRE PROTECTION DISTRICT

RESOLUTION NO. 5-2-16

A RESOLUTION OF THE ROSENDALE FIRE PROTECTION DISTRICT ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the Rosendale Fire Protection District recognizes the threat that natural hazards pose to people and property within the Rosendale Fire Protection District; and

WHEREAS the Rosendale Fire Protection District has participated in the preparation of a multihazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (hereafter referred to as the Plan) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Rosendale Fire Protection District from the impacts of future hazards and districts; and

WHEREAS the plan shall be monitored, evaluated, updated and resubmitted to the Rosendale Fire Protection District for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the Rosendale Fire Protection District recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Rosendale Fire Protection District will endeavor to integrate the Plan into the comprehensive planning process; and

WHEREAS adoption by the Rosendale Fire Protection District demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan.

NOW THEREFORE, BE IT RESOLVED BY THE Rosendale Fire Protection District, in the State of Misouri, THAT,

Section 1. In accordance with your jurisdiction, the Rosendale Fire Protection District adopts the Plan.

ADOPTED by a vote of <u>3</u> in favor and <u>0</u> against, and <u>0</u> abstaining, this <u>2</u> n χ
day of <u>May</u> , <u>2016</u> .
By (Sig): Daniel S. Brewer
Print Name DANIEL S. BREWER
ATTEST:
By (Sig): Willy Jumpaper - Sec.
Print Name: 41:1/a TRIMMER
APPROVED AS TO FORM:
By (Sig):
Print Name

Andrew County Health Department Savannah, Missouri

RESOLUTION NO. 04-26-16

A RESOLUTION OF THE ANDREW COUNTY HEALTH DEPARTMENT BOARD OF TRUSTEES ADOPTING THE ANDREW COUNTY HAZARD MITIGATION PLAN (UPDATED 2016)

WHEREAS the Andrew County Health Department Board of Trustees recognizes the threat that natural hazards pose to people and property within Andrew County Missouri; and

WHEREAS the Andrew County Health Department has participated in the preparation of a multihazard mitigation plan, hereby known as the Andrew County Hazard Mitigation Plan (*hereafter referred to as the Plan*) in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Andrew County Missouri from the impacts of future hazards and disasters; and

WHEREAS the Plan shall be monitored, evaluated, updated and resubmitted to the Andrew County Health Department Board of Trustees for re-adoption (at least) every five years from the date of the last adoption; and

WHEREAS the Andrew County Health Department Board of Trustees recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Andrew County Health Department Board of Trustees will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the Andrew County Health Department Board of Trustees demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

NOW THEREFORE, BE IT RESOLVED BY THE ANDREW COUNTY HEALTH DEPARTMENT BOARD OF TRUSTEES, in the State of Missouri, THAT:

Section 1. In accordance with State and Local law, the Andrew County Health Department Board of Trustees adopts the Plan.

ADOPTED by a vote of 5 in favor and 0 against, and 0 abstaining, this 26 day of

APril 2016 By (Sig): Ana dead ORMAN Print name: ATTEST: By (Sig.): Print name: Fredorick HOOPMAN APPROVED AS.TO FORM: By (Sig.): Print name: Andrew Hoffman

Appendix B: Maps & Reports

Hydrological Features **Essential Facilities Transportation Routes** Dam Locations and Hazard Level Dysart Lake Dam Potential Inundation Happy Holler Dam Potential Inundation Keller Lake Dam Potential Inundation Lake La Verne Dam Potential Inundation Savannah City Reservoir Potential Inundation Schweizer Lake Dam Potential Inundation Smith Lake Dam Potential Inundation Thompson Lake Dam Potential Inundation Amazonia 100-Year Flood Boundary Bolckow 100-Year Flood Boundary Rosendale 100-Year Flood Boundary Andrew County 100-Year Flood Plain Sinkholes Cropland and Grassland **HAZUS** Report



Brett Waddingham





Andrew County Transportation



Mo-Kan

Andrew County Dam Locations & Hazard



Dysart Lake Dam Potential Inundation



Happy Holler Dam Potential Inundation



Keller Lake Dam Potential Inundation



Lake La Verne Dam Potential Inundation


Savannah City Reservoir Dam Potential Inundation



Schweizer Lake Dam Potential Inundation



2,000

4,000 Feet

Smith Lake Dam Potential Inundation



0	1,000	2,000	4,000
Enclosed and the second second			Feet

Thompson Lake Dam Potential Inundation

















Andrew County Sinkholes







Cropland and Grassland In Andrew County, Mo







Cropland Grassland



Hazus-MH: Flood Event Report

Region I	Name:
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Andrew County - Multiple Returns

Flood Scenario:

multi-returns

Print Date:

Friday, July 19, 2013

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Missouri

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 435 square miles and contains 1,209 census blocks. The region contains over 6 thousand households and has a total population of 16,492 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 7,584 buildings in the region with a total building replacement value (excluding contents) of 1,020 million dollars (2006 dollars). Approximately 93.12% of the buildings (and 82.46% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 7,584 buildings in the region which have an aggregate total replacement value of 1,020 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1 Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	841,188	82.5%
Commercial	107,676	10.6%
Industrial	16,709	1.6%
Agricultural	19,827	1.9%
Religion	19,088	1.9%
Government	6,100	0.6%
Education	9,576	0.9%
Total	1,020,164	100.00%

Table 2

Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	147,955	84.3%
Commercial	12,735	7.3%
Industrial	1,503	0.9%
Agricultural	6,826	3.9%
Religion	3,933	2.2%
Government	1,087	0.6%
Education	1,392	0.8%
Total	175,431	100.00%

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 5 fire stations, 1 police station and no emergency operation centers.

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Andrew County - Multiple Returns
Scenario Name:	multi-returns
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 23 buildings will be at least moderately damaged. This is over 52% of the total number of buildings in the scenario. There are an estimated 15 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5.3 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

	1-1(D	11-3	20	21-	30	31	-40	41-50		Substan	tially	
Occupancy	Count	(%)	Count	(%)	Count	(%	6) Count	(%)	Count	(%)	Count	(%)	
Agriculture	0	0.00	0	0.0)	0	0.00	0	0.00	0	0.00	0	0.0
Commercial	0	0.00	0	0.00)	0	0.00	0	0.00	0	0.00	0	0.0
Education	0	0.00	0	0.0)	0	0.00	0	0.00	0	0.00	0	0.0
Government	0	0.00	0	0.0)	0	0.00	0	0.00	0	0.00	0	0.0
Industrial	0	0.00	0	0.0)	0	0.00	0	0.00	0	0.00	0	0.0
Religion	0	0.00	0	0.0	0	0	0.00	0	0.00	0	0.00	0	0.0
Residential	0	0.00	0	0.0	D	0	0.00	2	8.70	6	26.09	15	65.2
Total	0		0		0		2		6		15		

Table 3: Expected Building Damage by Occupancy

Building	1-1	0	11-20	0	21-30		31-4	40	41	-50	Substa	ntially	
Туре	Count	(%)	Count	(%)	Count	(%)	Count	('	%) Count		(%) Count	(%)	
Concrete	0	0.00	0	0.00	0	0.00		0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00		0	0.00	0	0.00	7	100.00
Masonry	0	0.00	0	0.00	0	0.00		0	0.00	1	50.00	1	50.00
Steel	0	0.00	0	0.00	0	0.00		0	0.00	0	0.00	0	0.00
Wood	0	0.00	0	0.00	0	0.00		2	14.29	5	35.71	7	50.00

Table 4: Expected Building Damage by Building Type

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classificatio		# Facilities					
	Total	At Least Moderate	At Least Substantial	Loss of Use			
Fire Stations	5	0	0	0			
Hospitals	0	0	0	0			
Police Stations	1	0	0	0			
Schools	10	3	0	3			

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,762 tons of debris will be generated. Of the total amount, Finishes comprises 37% of the total, Structure comprises 33% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 70 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 122 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 59 people (out of a total population of 16,492) will seek temporary shelter in public shelters.

The total economic loss estimated for the flood is 11.09 million dollars, which represents 6.32 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 11.06 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 78.08% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Los	S					
	Building	5.77	0.21	0.04	0.29	6.32
	Content	2.88	0.60	0.05	1.12	4.65
	Inventory	0.00	0.02	0.01	0.07	0.10
	Subtotal	8.66	0.82	0.10	1.49	11.06
Business Int	terruption					
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.03	0.03
	Subtotal	0.00	0.00	0.00	0.03	0.03
ALL	Total	8.66	0.82	0.10	1.51	11.09

Appendix A: County Listing for the Region

Missouri

- Andrew

Appendix B: Regional Population and Building Value Data

		Building V	alue (thousands of dol	lars)
	Population	Residential	Non-Residential	Total
Missouri				
Andrew	16,492	841,188	178,976	1,020,164
Total	16,492	841,188	178,976	1,020,164
Total Study Region	16,492	841,188	178,976	1,020,164

Flood Event Summary Report

Page 11 of 11

Appendix C: Public Involvement

Sample Letters to Planning Committee Members Hazard Mitigation Timeline Public Meeting Flyers Newspaper Coverage Public Meeting Presentation Community Profile Worksheet Cascading Hazards Worksheet Hazard Analysis Worksheet Ranking of Mitigation Methods Worksheet STAPLEE Criteria and Evaluation Worksheet Planning Committee Members Sign-In and In-Kind Documentation



Dr. David Brax Savannah RIII School District 408 W Market Savannah, MO 64485

Dear Dr. David Brax,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Avenue City School 18069 Hwy 169 Cosby, MO 64436

Dear Avenue City School,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



North Andrew School District 9120 Highway 48 Rosendale,MO 64483

Dear North Andrew School District,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please encourage someone from your agency/sector to become involved.

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Sincerely,



Julia Elder Country Club Village Clerk 6601 N Belt Hwy St Joseph, MO 64506

Dear Julia Elder,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Rosendale Fire Department c/o Garry Pittman 5120 CR 170 Rosendale, MO 64483

Dear Rosendale Fire Department,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Fillmore Fire Department c/o Ron Lance 230 N Florence St Box 33 Fillmore, MO

Dear Fillmore Fire Department,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Cosby/Helena Fire District c/o Dennis Ford 20278 State Rt O Cosby, MO 64436

Dear Cosby/Helena Fire District,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Mayor Connie McGeorge City of Savannah 402 Court Street Savannah, MO 64485

Dear Mayor McGeorge,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Andrew County Commissioners P O Box 206 Savannah, MO 64485

Dear Andrew County Commissioners,

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Sincerely,



Sheriff Bryan Atkins 400 East Main St, Box 206 Savannah, MO 64485

Dear Sheriff Bryan Atkins,

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Sincerely,



Blake Rudel Andrew County Ambulance P.O. Box 127 Savannah, MO 64485

Dear Blake Rudel,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Andrew Hoffman Andrew County Health Dept. 106 N 5th Street Savannah, MO 64485

Dear Andrew Hoffman,

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Sincerely,



Andrew County Highway Dept c/o Jim Galbreth P.O. Box 206 Savannah, MO 64485

Dear Andrew County Highway Dept,

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Sincerely,



Kenney Ragland Savannah Reporter P.O. Box 299 Savannah, MO 64485

Dear Kenney Ragland,

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Sincerely,



David Vincent Savannah Police Department 402 Court Street Savannah, MO 64485

Dear David Vincent,

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Sincerely,



Richard Scott County Club Village Police Dept 6601 North Belt Highway St Joseph, MO 64505

Dear Richard Scott,

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Sincerely,


Savannah Rural Fire Department 107 S Business Hwy 71 Savannah, MO 64485

Dear Savannah Rural Fire Department,

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Sincerely,



Daniel Brewer Rosendale Fire Department 14674 County Road 180 Rosendale, MO 64483

Dear Daniel Brewer,

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Sincerely,



Jim Maag Cosby – Helena Fire 19746 State Rt W Cosby, MO 64436

Dear Jim Maag,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Cindy Esely Treasurer Andrew County P.O. Box 206 Savannah, MO 64485

Dear Cindy Esely,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Doug Johnson 10701 St Rt H Savannah, MO 64485

Dear Doug Johnson,

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Sincerely,



Public Water Dist #4 Rodney Fields 4130 CR 127 Rosendale, MO 64483

Dear Public Water Dist #4,

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Sincerely,



Bolckow Fire Department c/o Jim Smith 502 St Mary's St Bolckow, MO 64427

Dear Bolckow Fire Department,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Laverna Village Nursing Home 904 Hall Ave, P.O. Box 279 Savannah, MO 64485

Dear Laverna Village Nursing Home,

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Sincerely,



Linda Lambright Andrew County Senior Center P.O. Box 283 Savannah, MO 64485

Dear Linda Lambright,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Shelley Zahand Northwest Health Services 803 Hwy 71 West Savannah, MO 64485

Dear Shelley Zahand,

In 2011, Mo-Kan partnered with public officials, community leaders and private citizens to create Andrew County's Hazard Mitigation Plan (HMP). The HMP is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to be involved in updating the 2016 HMP. If you are unable to take part please help by encouraging someone from your agency/sector to become involved.

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Sincerely,



Bruce Lundy City of Savannah Administrator 402 Court St Savannah, MO 64485

Dear Bruce Lundy,

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Sincerely,



Kenney Lance Director of Public Works City of Savannah 402 Court St

Dear Kenney Lance,

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Sincerely,



Jim Humphrey Univ of Mo Extension P.O. Box 32 Savannah, MO 64485

Dear Jim Humphrey,

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Sincerely,



Sarah Miller Andrew County Clerk P.O. Box 206 Savannah, MO 64485

Dear Sarah Miller,

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Sincerely,



Rebekah Beckett Clerk Amazonia P.O. Box 85 Amazonia, MO 64421

Dear Rebekah Beckett,

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Sincerely,



Cliff Watts Clerk Bolckow P.O Box 47 Bolckow, MO 64427

Dear Cliff Watts,

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Sincerely,



Teresa Neely Clerk, Cosby 186 S 3rd St Cosby, MO 64436

Dear Teresa Neely,

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Sincerely,

Hazard Mitigation Planning Timeline Andrew County

			20	15					2016		
IdSK	JULY	AUG	SEPT	ост	NOV	DEC	JAN	FEB	MAR	APR	МАҮ
Establish core planning committee											
Initial Plan Review Meeting	<u>24024</u>										
Hazard Identification	121030135										
Vulnerability Assessment	TIP POINT										
Capabilities Assessment	19-12-10-1										
Mitigation Strategies											
Implementation Strategy											
Planning Team Meetings											
Draft Plan	100444000										
Public Meetings											
Public Hearing					<u></u>						
Draft HMP to SEMA											
Revise Plan											
Final HMP to FEMA											
Adoption Resolutions											

A PUBLIC MEETING TO DISCUSS

Andrew County 's HAZARD MITIGATION PLAN



October 22, 2015

11:15 am The Senior Center 12737 St. Rt. E, Savannah, MO Are you a senior and concerned about the possible impacts of a natural disaster? The Hazard Mitigation Planning Committee invites you to attend a meeting about the Andrew County Hazard Mitigation Plan.

We will discuss the needs of seniors when preparing for a natural disaster .

QUESTIONS

Please contact Rebecca Thacker Mo-Kan Regional Council 224 N. 7th Street St. Joseph, MO 64501 Tele: 816-233-3144 We want your feedback on how to better prepare and protect the citizen's of Andrew County in the case of a natural disaster. Please attend a public meeting or contact us to set up a meeting at your workplace or with your civic group. A PUBLIC MEETING TO DISCUSS

Andrew County 's HAZARD MITIGATION PLAN



SEPTEMBER 15, 2015 7:00 p.m.

Are you concerned about the possible impacts of a natural disaster on your community? Do you want to help find ways to lessen that impact, and better protect the lives and property of the citizens in Andrew County? Then the Hazard Mitigation Planning Committee would like to invite you to attend the first in a series of public meetings meant to inform you about the **Andrew County Hazard Mitigation Plan.**

Andrew County's Sheriff Office & Jail 400 East Main, Savannah

QUESTIONS

Please contact Rebecca Thacker at: Mo-Kan Regional Council 224 N. 7th Street St. Joseph, MO 64501 Tele: 816-233-3144 This first meeting will give you a look into the planning process the Planning Committee will use to review the current Hazard Mitigation Plan, analyze the natural hazards, such as tornados and floods, and collect community profile information.

THE SAVANNAH REPORTER

MENUS

SENIOR CENTER MENUS AND ACTIVITIES

Monday - Ham, sweet potatoes, cole slaw, corn bread, blackberry crisp

8

Tuesday - Chicken pot pie with biscuit, potatoes, buttered beets, strawberry crisp

Wednesday - Ribettes, broccoli, carrot salad, macaroni and cheese, bun, applesauce

Thursday - Ghoul-lash, scary salad, slimy juice, witches bread, ghost pudding

Friday - Sausage/eggs, gravy, hash brown potatoes, tomato juice, biscuit, mixed fruit

Oct. 22 - The ambulance will be taking blood pressure and pulse at 10:30. MO-Kan will present a talk at 11:15 on Safety Plans. Luke's Group will entertain at 12:15. RSVP will start doing Part D rechecks. Please call 324-5634 for an appointment.

The Oats bus will run and the senior tax will be paying for seniors to ride, please call the center to schedule a ride.

Oct. 23 - The center will host bingo at 12:15 and Terry and Linda Lambright will be supplying the prizes. RSVP will start doing Part D rechecks. Please call 324-5634 for an appointment.

Oct. 26 - The Therapy Department of LaVerna Village will be hosting bingo at 12:15 in the main dining room.

Oct. 27 - Bible Study at 10:30 with Rev. Lionberger leading, Hospice Partners will present a program at 12:15. RSVP will start doing Part D rechecks. Please call 324-5634 for an appointment.

Oct. 28 - Diane Gould will lead Exercise at 10:30 Jeff Buckles will entertain at 12:15. The center will host the pitch tournament at 7:00.

Oct. 29 - Mosaic Life Care will be taking blood pressure and pulse at 10:30. RSVP will be hosting the Halloween Party starting with lunch at 11:30. Wear your best costume and come join the fun. RSVP will start doing Part D rechecks. Please call 324-5634 for an appointment.

The pitch tournament held the 14th of October was won by Bob Barnes and Ron Clark. Second place winners were Doyle Farmer and Ralph Farmer.

The birthday held the 15th of October was hosted by the oats committee. The committee furnished the cakes and new bingo cards that they played bingo with. Seventeen seniors sat at the birthday table. Elsie Ruch was the oldest being 99 years young. Other birthday seniors were: Norris Hoskins, Marvin Edwards, Marguerite Smith, Margaret Patterson, Joyce Howard, Carol Wilhelm, Ilene Cotter, Maurine Jarrett Evelyn Eurst Wayne Drydale Norma Clizer Herb

MEETING NOTICES

TOPS (Take Off Pounds Sensibly) meets Mondays at First Baptist Church, 500 E. Pawnee. Weigh-in, 4:45 p.m.; meeting, 6 p.m. Contact Rhonda Howard (324-3645) or Jean Myers (324-4476) for more information.

The Andrew County Nursing Home board will meet. October 27, at 1:30 p.m. at Shady Lawn Nursing Home.

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A Night at the Movies **State Theater in Mound City**

Do you remember the first motion picture you saw on the big screen? Was it an indoor theater or a drive-in? Think back and remember your anticipation of waiting for the curtain to rise, finding the right seat or parking spot, making one last trip to the lobby for a soda pop and popcorn. Was there a certain song you remember from that movie? Music plays an important part of a movie. It draws you in by being dramatic, soothing or romantic. It can make you laugh or have you covering your eyes with the knowledge that something very scary is coming. Perhaps hearing a song from a movie will bring back a certain memory.

To kick off the 28th season, on October 24th, the State Theater in Mound City, MO is having a Community Talent Show, "A Night at the Movies", featuring music from the big screen. Performers from Mound City and surrounding areas will showcase their talents on the stage beginning at 7:00 p.m. The line-up will include vocal and instrumental performances, dancing, audience participation, and possible other surprises.

Tickets are available at all Mound City banks, Bank CBO in Oregon or by calling 660-442-5909 and leaving your ticket request. They will also be available at the door the night of the performance. This event is being sponsored by State Theater Arts Council and Missouri Arts Council.



Savannah Missouri, Class of 1958 and 1959. Join us for a get together, Sunday, October Oma 25, 1:00 p.m. American Legion, 501 E. Price, Savannah. Bring a covered dish. For more information call Merrill Karr 816-271-3880

Letters to the editor requirements and policy: All letters must be signed by the author, and include the address and phone number. Only your name will be printed. "Letters" steps are not the opinions of the Savannah Reporter or staff. Editing where deemed necessary will be done.

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night was dedicated to Bonnie Rudolph. A moment of v silence was held before the game in her honor.

Left: The band plays the National Anthem before the game.

See all photos on our Facebook page The Sports Reporter.

Six million dollars available for hazard mitigation

BY KENNY RAGLAND The Sayannah Reporter

Governmental and public bodies have an opportunity to apply for matching grant monies to reduce safety hazards.

One group has already received theirs, and others are welcome to participate and apply.

Andrew County Emergency Management, in conjunction with the Missouri Kansas Economic Development Council, is holding the second of three required meetings, at 7 p.m. on Sept. 15 at the meeting room in the Andrew County Sheriff's Department in Savannah.

Designed to meet federal grant requirements, the meeting invites all interested government and public groups to participate, in order to meet the grant qualifications.

"The grants are 75/25 matching funds," said Emergency Management Co-Director Roger Latham. "Groups have to come up with 25 percent in order to get the other 75 percent."

The Savannah R-III School District has already done so, and been approved.

"We have applied for a tornado shelter to be constructed on the school property," said Superintendent David Brax. "Our board approved our intent to apply."

Currently, Rosendale groups are in the process of doing the same thing for tornado shelters there.

"It is a really good thing," Latham said, "Communities that don't have shelters can really benefit by this program."

The grant program has to be updated every five years.

"That is what we are doing now," said MOKAN community development planner Rebecca Thatcher, "We would like to increase the public input and in-

crease the exposure."

An additional program is for groups to borrow FEMA money.

"That is a way to come up with the 25 percent matching amount," Latham said.

The grants are funded through FEMA for pre-disaster mitigation. Examples of use are for flooding risks, safe rooms, proper drainage and property elevation projects and additional hazard mitigation.

The program is open to state and local governments and certain non-profit organizations.

The first meeting was held on August 25.

Hazard mitigation planning is the process used to identify risks and vulnerabilities associated with natural disasters and to develop long-term strategies for protecting people and property in future hazardous occurrence events.

History shows that physical, financial and emotional losses caused by natural disasters can be reduced significantly by appropriate mitigation planning.

By focusing attention to properly using resources, future occurring natural disasters can be made less harmful.

A past focus for Andrew County was proper tornado shelters.

"That concern will continue to be a focus for our group," said Thatcher.

The Savannah R-III School Administration hopes to learn of their FEMA grant approval in October or November of this year.

Enrollment up in Savannah R-3

BY KENNY RAGLAND The Savannah Reporter

One good sign of a health school district, is if the number of students in increasing.

David Brax, superintendent of the Savannah R-III School District, had a very good report regarding enrollment numbers.

"We are up by 52 kids," he said. "More people are moving here to educate their children, then are leaving the area."

The only schools to lose kids, are Minnie Cline and Amazonia.

"Minnie Cline dropped 10," Brax said. "Amazonia lost 14."

Every other school in the area increased enrollment, with both Minnie Cline and Amazonia graduating kids to upper levels.

"Our high school is up by 15," Brax said.

The middle school increased

the most.

"Their enrollment went up by 35." he said.

Comparisons of enrollment, from 2013 show increases across the board.

The district decided to add an additional kindergarten class at Minnie Cline.

lower class size," Brax said.

The district is budgeted to continue to receive 97 percent of the state foundation formula.

"We are figuring to obtain \$6,100 per student from the state," Brax said. "That is the same as last year."

Additional revenue comes from local property taxes.

Averages from the state of Missouri, show that combined school districts spend \$9,600 per student on average.

Brax said. "But our local property taxes do help us to educate our Andrew County area students."

Nationwide school enrollment figures show an average increase of six percent annually, at the elementary level.

According to the U.S. census, "This will help us to keep a racial and ethnic minorities under the age of five are now the majority, increasing over the population of white Caucasian children.

Several states already show white Caucasians as the minority, including Hawaii, California, New Mexico and Texas.

As these children age, they will be moving into the school systems, increasing the enrollment for all American school districts.

"We are not that high here,"







Welcome & Introductions

- MACOG, SEMA & Hazard Mitigation Planning
- In 2002, MACOG was approached by the Missouri State Emergency Management Agency (SEMA) to facilitate Hazard Mittgation Plans for Missouri counties.







- Jurisdiction participation
- All local jurisdictions must adopt the completed plan, as well as document that they participated in the planning process (includes all cities and villages, school districts and universities, special districts (road, townships, etc)
- Participation is met by a jurisdiction attending 2 of the 3 meetings and submitting requested information
 - Review current plan update, delete & add
- National Flood Insurance Program (NFIP)
- Participation in NFIP must be accurately defined for all jurisdictions, not just the county

Mo-Kan

- a Hazard Mittigation Grant Program (HMGP)
 a Pre-disaster Mittigation Program
 - Pre-disaster Mitigation Program (PDM)
- Flood Mitigation Assistance (FMA)
- Repetitive Flood Claims (RFC)
 Severe Repetitive Loss (SRL)



			2	ង					2016		
Task	JULY	AUG	SEPT	Ę	NOV	BEC	JAN	FEB	MAR	APR	MAY
stablish core planning committee											
aitiai Plan Review Meeting											
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ulnerability Assessment			10000								
apabilities Assessment		ないた									
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What are your concerns?	How you can help: In-kind Match
■ Handout	 Andrew County is responsible for \$7,338 in-kind match
B Discussion	 In-kind match activities include:
	a Planning Committee (unless elected or appointed)
	Public meeting attendees
	 Hosting public meetings and talking to community groups
	c Researching or compiling data related to the plan
	Donation of time working on the 2016 Hazard Mitigation Plan
	 Time spent driving to HMP activities
	*All donated bours and labor must be documented
Mo-Kan	Mo-Kan



-Kan

The Next Steps

- 1st public meeting (Tuesday, September 15th, 7 pm)
- Schedule additional public meetings and public outreach
- Encourage people to attend and provide feedback
- 3rd Planning Committee meeting (October 13th, 7 pm)

Mo-Kan



Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: ____

Jurisdiction:

Return to:

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by:	
Phone:	
Email:	
Date:	

Please return questionnaires by mail, email, or fax to:



CAPABILITY ASSESSMENT & INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan. Although some of this information may have been captured in your previous mitigation plan, it is important to ensure this information is current in the plan update

Please indicate which of the following your jurisdiction has in place. For elements that do not pertain to your type of public entity, please indicate with "N/A". If applicable, please provide a completion date for the element. If your jurisdiction does not have a particular element, and a higher level of government has the authority pertaining to your jurisdiction, please indicate this in the comments column. If your jurisdiction has any of the <u>underlined and bolded</u> elements, please provide a copy of the document to the contact listed on the front and indicate method in the comments column (i.e. available on the web, will email or mail).

Element	Yes, No, N/A	Comments
Planning Capabilities		
Comprehensive Plan	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date:	
County Emergency Operations Plan	Date:	
Local Recovery Plan	Date:	
County Recovery Plan	Date:	
City Mitigation Plan	Date:	
County Mitigation Plan	Date:	
Debris Management Plan	Date:	
Economic Development Plan	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
Watershed Plan	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date:	

Element	Yes; No; N/A	Comments
Rolicies/Ordinance		
Zoning Ordinance	Varaian	
Building Code	Date:	
Floodplain Ordinance	Date.	
Subdivision Ordinance		
Tree Trimming Ordinance	······································	
Nuisance Ordinance		
Storm Water Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance	·····	
Landscape Ordinance	Name of States and America and the state of the state of the state of the states of the states of the states of	
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design	· · · · · · · · · · · · · · · · · · ·	
Hazard Awareness Program		
National Flood Insurance Program		
Community Rating System (CRS) program under the National Flood Insurance Program (NFIP)?	If so, what is your current level rating?	
National Weather Service (NWS) Storm Ready Certification		
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)	······································	
ISO Fire Rating	Rating:	
Economic Development Program		
Land Use Program		
Public Education/Awareness		
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program		
Tree Trimming Program		
Engineering Studies for Streams (Local/County/Regional)		
Mutual Ald Agreements		
Studies/Reports/Maps		
Hazard Analysis/Risk Assessment (City)		
Hazard Analysis/Risk Assessment (County)		
Evacuation Route Map		
Critical Facilities Inventory		
Vulnerable Population Inventory		
Land Use Map		

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•	Element	Yes, No, N/A	Comments
	.Staff/Department		
	Building Code Official		
	Building Inspector		
	Mapping Specialist (GIS)		
	Engineer		
•	Development Planner		
	Public Works Official		
	Emergency Management Coordinator		
	NFIP Floodplain Administrator		
	Bomb and/or Arson Squad		
	Emergency Response Team		
	Hazardous Materials Expert		
	Local Emergency Planning Committee		
	County Emergency Management Commission		
•	Sanitation Department		
	Transportation Department		
	Economic Development Department		
	Housing Department		
	Historic Preservation		
	Non-Governmental Organizations (NGOS)	sis there a local chapter? Yes or No	
	American Red Cross	· · · · · · · · · · · · · · · · · · ·	
	Salvation Army		
1	Veterans Groups	· · · · · · · · · · · · · · · · · · ·	
	Local Environmental Organization		
	Homeowner Associations		
	Neighborhood Associations		
:	Chamber of Commerce		
	Community Organizations (Lions, Kiwanis, etc.		TO SANTA SA TANÀNA MANJARANA AMIN'NA TANÀNA MANJARANA MANJARANA MANJARANA MANJARANA MANJARANA MANJARANA MANJARA
	FinancialiResources	YesionNo	
	Apply for Community Development Block Grants		
	Fund projects thru Capital Improvements funding		
-	Authority to levy taxes for specific purposes		
	Fees for water, sewer, gas, or electric services		
	Impact fees for new development		
-	Incur debt through general obligation bonds		
	Incur debt through special tax bonds		
- - -	Incur debt through private activities		
	Withhold spending in hazard prone areas		

For plan updates, the plan maintenance process outlined in your previous plan requires all participating jurisdictions to incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate. A key element of effective implementation of mitigation is for the mitigation plan to be incorporated in existing authorities, policies, programs, and resources. Next to each applicable planning mechanism, indicate how your jurisdiction incorporated the previous mitigation plan. If no incorporation has occurred, please explain, including background information detailing any challenges preventing incorporation.

Planning Capabilities	Method of Incorporation Since Previous Plan or Challenges Preventing Incorporation
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	·
Debris Management Plan	-
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	·

Additional Questions

- 1. How is your government structure organized? (Commission, Mayor/City Council, how many members)
- 2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.
- 3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants.
- 4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.
- 5. How many outdoor warning sirens are in your community?

How are they activated (indicate responsible department/personnel)?

- 6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.
- 7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards?

Please provide address locations:

- 8. List residential, commercial and industrial development in your jurisdiction since last plan update.
- 9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.
- 10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known.

11. Please list major employers in your jurisdiction with an estimated number of employees.

- 12. Please list Mitigation Planning Committee members who served during the development of the previously approved plan. Was the process set forth for monitoring the implementation of the previously approved mitigation plan adhered to? Did the Committee meet as was specified in the previously approved plan? Why or why not?
- 13. Describe your jurisdiction's participation in the NFIP. Include information about how compliance with the NFIP is enforced locally.

VULNERABILITY ASSESSMENT

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets. In the hazard specific column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Riverine Flooding (Major & Flash)-RF	Severe Winter Weather (incl. snow, ice, severe cold)- SWW	Hazardous Materials Release (fixed facility, accidents)- HM
Dam Fallure-DF	Droughts-D	Mass Transportation Accident-MTA
Levee Failure-LF	Extreme Temperatures-ET	Nuclear Power Plants (emergencies & accidents)-NPP
Earthquake-EQ	Fires (structural, urban, and wild)-F	Public Health Emergencies/Environmental Issues-PH
Land Subsidence / Sinkholes-LSS	Attack (nuclear, conventional, chemical, and biological)-A	Special Events-SE
Severe Thunderstorm (incl. winds, hall, lightning)- ST	Civil Disorder-CD	Terrorism-TX
Tornadoes-T	Cyber Disruption-CyD	Utilities (interruptions & system failures)-U

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities Hospitals and other medica facilities Police stations Fire station Emergency Operations Centers	High Potential Loss Facilities Power plants Dams/levees Military installations Hazardous material sites Schools Shelters Day care centers Nursing homes Main government buildings	Transportation and Lifeline Highways, bridges, and tunnels Railroads and facilities Bus facilities Airports Water treatment facilities Natural gas facilities and pipelines Oil facilities and pipelines Communications facilities
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Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A"). In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

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Economic Assets (Major Employers, etc)

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HISTORIC HAZARD EVENTS

Please fill out the sheet on the next page for each significant hazard event that affected Your **Jurisdiction.** Make as many copies as necessary to record all events and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	
	1

Jurisdiction	
Type of event	
Nature and magnitude of event	· ·
Location	·
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of	
Source of information	
Comments	5

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction:

The contractor/plan development facilitator has provided a list of actions proposed in the previously approved plan for each jurisdiction. Use the worksheet below to evaluate whether each action is still current, feasible, desirable, and/or creates benefit that outweighs the cost. The worksheet should include information on progress made in the implementation of the action, if any. Some of the actions might have been ongoing in nature, such public information and education programs. When this is the case, indicate what activity has occurred during the previous five years, and indicate if this program is still viable enough that it should be carried on into the future.

If no progress has been made in the implementation of a given action, discuss why. Note that implementation is not a requirement. However, if no progress has been made, perhaps this is an action that would be appropriate to delete in the updated plan.

During review of the previously approved actions, consider whether any new actions should be proposed. Perhaps damages from a recent hazard event have indicated the need for new approaches to protect property and life. Review the problem statements from the updated plan for ideas. Also review the FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013)*.

Action # from providuely	
approved plan the start	
Description of action	
Person of agency	
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Progress made on	
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previous plan adeption	
Inaction is ongoing in	
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Action # from previously		
approved plan		
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Person or agency		
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Jurisdiction:_____

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Action # from nreviously	
approved plan w	
Description of action	
Person on agency	
responsible for	
implementation	
Designate into which of the	following four categories the previously proposed action should be placed, including
discussion of that designa	tion.
Completed since previous	
plan adoption, and	
description of progress	
Not Starled/Continue in	
Plan Update, and	
discussion of reasons for the	
lack of implementation	
In Progress/Continue in	
Plan Update, with a	
description of the progress	
made to date a drag with a	
Deleted from the update	
with a discussion of the	
reasons for deletion	

Cascading Hazards Resulting from Natural Disasters

Hazard	Power and Communications	Water Supply	Business	Civil Unrest	Computer Failure/ loss of records	Transportation	Health and/or Environment	Government Operations
Tornado		\boxtimes				\boxtimes		
Severe Thunderstorm								
Flood								
Severe Winter Weather								
Drought								
Heat Wave/Extreme Heat		\boxtimes						
Earthquake				\boxtimes				
Dam Failure/Levee Failure								
Wildfire/Brush Fire								
Landslides and Subsidence								

Hazard Analysis Worksheet Andrew County

Jurisdiction:

Part One

Potential Magnitude: In the chart below, please indicate, in your opinion, the potential magnitude of the next event for each of the listed natural hazards within your jurisdiction/district. The categories are:

Less than 10% of the jurisdiction/district will be affected Negligible: Limited: 10%-25% of the jurisdiction/district will be affected Critical: 25%-50% of the jurisdiction/district will be affected More than 50% of the jurisdiction/district will be affected Catastrophic:

Hazard	Negligible	Limited	Critical	Catastrophic
Tornado				
Severe Thunderstorm				
Hail				
Lightening				
High Winds				
Flood				
Severe Winter Weather				
Blizzard	·			
Ice Storm				
Extreme Cold				
Drought				
Heat Wave/Extreme Heat				
Earthquake				
Dam Failure/Levee Failure				
Wildfire/Brush Fire				
Landslides and Subsidence				

Part Two

Likely:

Frequency of Occurrence: In the chart below, please indicate, in your opinion, the probability of each of the listed natural hazards within your jurisdiction/district. The categories are:

Unlikelv: Less than 1% probability of occurrence in the next 100 years

Possible: Between 1% and 10% probability in the next year (one occurrence in 100 years) Between 10% and 100% probability in the next year (one occurrence in 10 years) Highly Likely: Near 100% probability in the next year

Hazard	Unlikely	Possible	Likely	Highly Likely
Tornado				
Severe Thunderstorm				
Hail				
Lightening				
High Winds				
Flood				
Severe Winter Weather				
Blizzard				
Ice Storm				
Extreme Cold				
Drought				
Heat Wave/Extreme Heat				
Earthquake				
Dam Failure/Levee Failure				
Wildfire/Brush Fire				
Landslides and Subsidence				

Part Three

Speed of Onset: In the chart below, please indicate, in your opinion, the probably amount of warning time for each of the listed natural hazards. The categories are:

Minimal (or no) warning 6 to 12 hours warning

12 to 24 hours warning

More than 24 hours warning

Hazard	Minimal	6 to 12 hours	12-24 hours	More than 24
				hours
Tornado				
Severe Thunderstorm				
Hail				
Lightening				
High Winds				
Flood				
Severe Winter Weather				
Blizzard				
Ice Storm				
Extreme Cold				
Drought				
Heat Wave/Extreme Heat				
Earthquake				
Dam Failure/Levee Failure				
Wildfire/Brush Fire				
Landslides and Subsidence				

<u>Part Four</u>

Hazard Impacts: In the chart below, mark which negative impacts will likely be caused by each listed natural hazard (i.e. if a flood is more than 50% likely to disrupt transportation, mark that category). Mark all that apply.

Hazard											
1142414	Power and Communications	Water Supply	Business	Civil Unrest	Computer Failure/ loss of records	Transportation	Health and/or Environment	Schools & Universities	Government Operations	Other	Other
Tornado											
Severe Thunderstorm											
Hail											
Lightening											
High Winds											
Flood											
Severe Winter Weather											
Blizzard											
ice Storm											
Extreme Cold											
Drought											
Heat Wave/Extreme Heat											
Earthquake											
Dam Failure/Levee Failure											
Wildfire/Brush Fire											
Landslides and Subsidence											

Ranking of Mitigation Methods

Please rank the following Mitigation Methods from Andrew County's 2011 Hazard Mitigation Plan using a scale of 1 - 5, with "1" indicating the highest probability of effectiveness, while a rank of "5" indicates the lowest. Please refer to page 135 in the 2011 plan for more detailed descriptions.

- 1. Acquisition of Hazard-Prone Structures
- 2. Active Public Education and Awareness
- 3. Best Management Practices (BMPs)
- 4. Building Codes
- 5. Building Density Controls
- 6. Channel Maintenance
- 7. Construction of Barriers Around Structures
- 8. Critical Facilities Protection
- 9. Dam Breach Exclusion Zones
- 10. Dams/Reservoirs
- 11. Design Review Standards
- 12. Easements
- 13. Elevation of Structures
- 14. Emergency Response Services
- 15. Environmental Review Standards
- 16. Floodplain Development Regulations
- 17. Floodplain Zoning
- 18. Forest Fire Fuel Reduction
- 19. Hazard Information Centers
- 20. Hazard Threat Recognition

- 21. Hazard Warning Systems
- 22. Health and Safety Maintenance
- 23. Hillside Development Regulations
- 24. Levees and Floodwalls
- 25. Open Space Preservation
- 26. Post-disaster Mitigation
- 27. Preparedness
- 28. Real Estate Disclosure Statements
- 29. Relocation Out of Hazard Areas
- 30. Safe Room/Shelter
- 31. Sediment and Erosion Control Regulations
- 32. Special Use Permits
- 33. Storm Water Management Regulations
- 34. Stream Corridor Restoration
- 35. Stream Dumping Regulations
- 36. Structural Retrofits to Existing Buildings
- 37. Subdivision and Development Regulations
- 38. Transfer of Development Rights
- 39. Underground Utility Relocation
- 40. Urban Forestry and Landscape Management
- 41. Utility and Building Design Performance Standards
- 42. Wetlands Development Regulations

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title:		Jurisdiction:		
Action ID:				
STAPLEE Criteria	Evaluation Rating	5	Score	·
y and a second	Maybe YES = 2	2	······································	• . •
• • • ·	Probably NO = 1 Definitely NO = 0	• • .		
S: Is it Socially acceptable?				
T: Is it Technically feasible and potentially successful?				•
A: Does the jurisdiction have the administrative capacity to execute this action?				
P: Is it Politically acceptable?				
L: Is there Legal authority to implement?				
E: Is it Economically beneficial?	a giù,			
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)				
Will historic structures be saved or protected?				
Could it be implemented quickly?				
STAPLEE Score		<u>.</u>		

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	, ,
Mitigation Effectiveness Score		• .

Total Score (STAPLEE Score + Mitigation Effectiveness Score):

LIUILY DOVDI. LILLEI (SO - DOMES	Priority Level:	High	(30+	points)
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Medium (25-29 points)

. . . .

and a second second

Low (less than 25 points)

Completed by (name/title/phone #):

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

The goal of each proposed mitigation action is life safety and/or reduction or prevention of damage from a hazard event. In order to determine the effectiveness in accomplishing this goal, evaluate each action using the criteria below which includes criteria utilizing the STAPLEE method. This method analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions.

Ask the following STAPLEE criteria questions about each proposed mitigation action and strategies. Assign a score to each criterion as follows: (Definitely YES = 3, Maybe YES = 2, Probably NO = 1, Definitely NO = 0)

STAPLEE criteria:

- Social: Is the proposed strategy socially acceptable to the community?
- Technical: Will the proposed strategy work? Will it solve a problem independently?
- Administrative: Can the community implement the strategy? Is there someone to coordinate and lead the effort?
- **Political**: Is the strategy politically acceptable? Is there public support both to implement and to maintain the project?
- Legal: Is the community authorized to implement the proposed strategy? Is there a clear legal basis or precedent for this activity?
- Economic: What are the costs and benefits of this strategy? Does the cost seem reasonable for the size of the problem and the likely benefits? After implementation, will the benefits over time be more than the cost of the project?
- Environmental: Will the project have a positive impact on the environment?
- Will historic structures be saved or protected?
- Could it be implemented quickly?

Mitigation Effectiveness:

Ask the following questions about each proposed mitigation action as it relates to life/safety and/or reduction or prevention of damages. Assign 5-10 additional points.

Will the implemented action result in lives saved?

Will the implemented action result in a reduction of disaster damages?

Andrew County Emergency Management

400 E Main Savannah, MO 64485 Phone 816-324-5023

DATE: 9/15/2015

TOTAL DUE

60.00

TO: MoKan Regional Development St. Joseph MO

SALESPERSON	P.O. NUMBER	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
					Due on receipt

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
	Conference Room with Audio Visual Equipment for 2hrs for Hazard Mitigation Planning meeting for Andrew County, Public Meeting	60.00	60.00
	FEE WAIVED		
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		SUBTOTAL	
		SALES TAX	
	Shif	PING & HANDLING	

Make all checks payable to Andrew County .

If you have any questions concerning this invoice, contact: Roger Latham at 816-324-5023 or ema002@andrewcounty.org.

Andrew County Hazard Mitigation Plan Andrew County Sheriff Office and Jail, Savannah Tuesday, September 15, 2015 at 7 pm Public Meeting

- I. Welcome and Introductions
- II. Background and purpose of the Hazard Mitigation Plan (HMP)
- III. Grants and funding opportunities
- IV. Participation requirements for jurisdictions
- V. Timeline
- VI. What are your concerns? Discussion/feedback
- VII. How you can help
- VIII. Next Steps

Andrew County Hazard Mitigation Plan – Public Meeting #:	Tuesday, September 15, 2015
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Andrew County Emergency Management

400 E Main Savannah, MO 64485 Phone 816-324-5023 [Fax Number] INVOICE

DATE: 8/25/2015

TO: MOKAN REGIONAL DEVELOPMENT St. Joseph MO

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	SHIP	PING & HANDLING	
		TOTAL DUE	60.00

Make all checks payable to Andrew County .

If you have any questions concerning this invoice, contact: Roger Latham at 816-324-5023 or ema002@andrewcounty.org.



Andrew County – Planning Committee Hazard Mitigation Plan Meeting

Date:Tuesday, August 25, 2015Time:7:00 pmLocation:Andrew County Sheriff's Office and Jail

AGENDA

- I Welcome and Introductions
- II Background & Purpose of the Hazard Mitigation Plan (HMP)
- III Grant Programs Linked to Approved Plan
- IV HMP Participation Requirements & Timeline
- V Public Outreach & In-kind Match
- VI Data Collection Questionnaires please return to Rebecca prior to next meeting
- VII Discussion of Hazards
- VIII Next Steps next meetings Tuesday, Sep. 8th and Tuesday, Oct. 13th

Hazard Mitigation Plan Meeting #1 Tuesday, August 25th Andrew County

Mileage to meeting 37 miles m Z 0 0 0 \mathcal{V} gl6-262-9763 Yockyholiowma@bbwi.met BIG-324-5801 Dryan.attlins@andrewcocnty.pra brucelundisarmo@gmail.com 816 - 324 - 3144 tstmiller dealmil. com Pis-asa-1817 hoff mat Cup 4 , maplic org dbrax@Savannahr3.com schu illegingen angleilic org 1 shulte Choithandrewiors Lobe/Qu/12 @ 9 mail.com (1) bE1E. hee. 918 D K FOXD @ BB WAY NET. 816 3692325 816-324-7503 Phone/Email 816-567-2965 1400-582-2690 816-587-3203 8110 201 9869 Andrew County Health Department of Salanneh Andrew CO, Hearty COSBY-HELENA FIRE. Jurisdiction/Agency 1 202. ANDrew Co. Comm. Rosendale Fire fudres County North Andrew Savanneh R-III JUNO Andrew County Andrew Co. SH CR. 1P Daniel Brunch Bob Caldwell A church Jim Shultz Hudrew Hoffmon LESLEY SCHULTE WENNIS FORD First & Last Name David Brax X Such miller Blagen ATTUNG \checkmark >

Andrew County Hazard Mitigation Plan Meeting #1 Tuesday, August 25th

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Andrew County Emergency Management

400 E Main Savannah, MO 64485 Phone 816-324-5023 INVOICE

DATE: 10/8/2015

TO: MoKan Regional Development St. Joseph MO

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					Due on receipt

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
	Conference Room with Audio Visual Equipment for 3hrs for Hazard Mitigation Planning Commissioner work session for Andrew County	30.00 x 3 hours	90.00
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		SALES TAX	
	SHIP	PING & HANDLING	
		TOTAL DUE	90.00

Make all checks payable to Andrew County .

If you have any questions concerning this invoice, contact: Roger Latham at 816-324-5023 or ema002@andrewcounty.org.

Andrew County Hazard Mitigation Plan Andrew County Sheriff Office and Jail, Savannah Tuesday, October 8, 2015 at 11:00 am Work Session Agenda

- I. Discuss Actions that Andrew County is Responsible Jurisdiction Of
- II. Evaluate Actions that Andrew County is the Responsible Jurisdiction Of
- III. Discuss New Actions

Andrew County Hazard Mitigation Plan –Commissioner Work Session #1 Thursday, October 8, 2015

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Andrew County Emergency Management

400 E Main Savannah, MO 64485 Phone 816-324-5023 INVOICE

DATE : 10/13/2015

TOTAL DUE

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TO: MoKan Regional Development St. Joseph MO

SALESPERSON	P.O. NUMBER	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
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QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
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		SUBTOTAL	
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	SHIF	PING & HANDLING	

Make all checks payable to Andrew County

If you have any questions concerning this invoice, contact: Roger Latham at 816-324-5023 or ema002@andrewcounty.org.

Andrew County Hazard Mitigation Plan Agenda Planning Committee Meeting #3 October 13, 2015 at 7 pm

- I. Discussion on Evaluation Forms
 -Questions
 -Please turn in at the end of the meeting
- II. Volunteer hours forms-Please turn in-Need to find out where we stand with in-kind
- III. Discussion on what action to continue, add and delete

 Evaluation sheets indicated if continuing, modifying, deleting
 Action Worksheets (handout)
 Funding/responsibility
 Plan maintenance
 Exchange contact information with other planning committee members to collaborate/discuss ideas
 Email/mail Action Worksheets and volunteer form by November 6th
 (Rebecca@mo-kan.org or Mo-Kan, 224 N. 7th Street, St. Joseph, MO 64501)
- IV. Local jurisdiction work sessions
 -Discuss action worksheets in small groups
 -Additional people can join and their time can count towards the match
 -Must have sign in sheets and agenda
- V. Next steps jurisdictions review plan
 -Inform local jurisdiction about the HMP and get on December or January agenda
 -Public comment opportunities
 -Resolution template (handout available)
 -Please send me any public notices, agendas, etc. that mention the plan
 -Please send/email me copy of the resolution when the plan is approved
- VI. Discussion on Public Outreach and In-Kind Match
 -Public meeting Thursday, October 22nd at 11:30 at Senior Center, Savannah, MO
 -Additional public meetings ideas?
 -In-kind match please turn in forms so we can see where we stand with the match
- VII. Next meeting none required at this point

Andrew County Hazard Mitigation Plan – Planning Committee Meeting #3 Tuesday, October 13, 2015 Mileage to meeting 5/ Ð M e M 00 radueyhummen @ NWheelth - services . org marily ance formil com hoftma 2@ 444. mopulic larg ens 002 @ audu ling log bruce lundy sarmo O gmai i. con TOCKY HOLLOW MO & bowi-WET Schull 20 pha. mopulatic. and garry, p. Hman Zalter . com Ushaltz @ Northandrew or **Phone/Email** 816 567 -2965 0507-295-918 816-324-5607 816-558-2085 North Andrew Andrew Co, Hearth No Andrew Country. Health Dot. Savannel MD FIII MOVE Address 5g uguna h Rosendale Parily , Jener Fillmore JAVA MAH RUSENDALE 278 Andrew Hoffman Danthe BREWER Legel L LATIAN ESLEY SCHULTE Carry PHMan First & Last Name Rodney Hummer Jim Shultz m Zaru Bruce Lunely

Andrew County Hazard Mitigation Plan – Planning Committee Meeting #3 Tuesday, October 13, 2015

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Address	P.O. Box 32 Savanah Mo 64485- 501 00 135	Rosandale MO	186 S 310 (Dosby No 44436	186. 'S 3rd Cosby Mo 64436		
First & Last Name	Tim Aumphrey	Bob Caldwell	John NeelV	Terosea Neely		

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Andrew County Emergency Management

400 E Main Savannah, MO 64485 Phone 816-324-5023 INVOICE

DATE: 9/8/2015

TOTAL DUE

60.00

TO: MoKan Regional Development St. Joseph MO

SALESPERSON	P.O. NUMBER	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
					Due on receipt

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
	Conference Room with Audio Visual Equipment for 2hrs for Hazard Mitigation Planning meeting for Andrew County	60.00	60.00
	FEE WAIVED		
		SUBTOTAL	
		SALES TAX	
	SHI	PPING & HANDLING	

Make all checks payable to Andrew County .

If you have any questions concerning this invoice, contact: Roger Latham at 816-324-5023 or ema002@andrewcounty.org.

Andrew County Hazard Mitigation Plan Agenda Planning Committee #2 September 8, 2015 at 7 pm

- I. Review of Data Collection Questionnaire forms
- II. Determine/Update Mitigation Goals (from 2011 plan)

Andrew County's mitigation goals were derived from existing goals in the comprehensive plan, St. Joseph Missouri's Project Impact (whose jurisdiction adjoins Andrew County to the south) the Andrew County Emergency Operations Plan, Mo-Kan Regional Council's Flood Buyout Program Guide of 1994, the Disaster-Resistant Jobs Strategy, and the Mo-Kan Region Comprehensive Economic Development Strategy (CEDS).

Mitigation goals and objectives are:

Goal 1: Protect the Lives, Property and Livelihoods of All Citizens.

- Objective: Protect citizens' lives and property.
- Objective: Provide sufficient warning of impending disasters.
- Objective: Identify the citizens most vulnerable to disasters and plan accordingly.

Goal 2: Manage Growth in Designated Hazard Areas Through Sustainable Policies, Principles and Practices.

- Objective: Decrease the occurrence of disasters.
- Objective: Decrease the cost of the next disaster.
- Objective: Increase our economic resistance to disasters.

Goal 3: Ensure Access to Information Regarding Hazards Preparation and Recovery. Objective: Increase knowledge among citizens about disaster safety.

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster.

• Objective: Increase disaster mitigation management capability in local governments.

- Objective: Strengthen critical infrastructure.
- III. Hazard Analysis
- IV. Update Rankings of Mitigation Methods
- V. Review of 2011 Mitigation Actions
- VI. Public Outreach Public Meeting September 15th

In-kind match

- VII. Next steps New Mitigation Actions, NOI forms for grant projects
- VIII. Next meeting on Tuesday, October 13th, 7 pm

First & Last Name	Jurisdiction/Agency	Phone/Email	Mileage to meeting
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Boh Callbuell	NnDrew County	8181-236-218	4
Johnney D. Neely	andrew County, Casby	816-378-2315	35
Torosoa Noolu	Village of Casha	816 - 262-2591	
Ron Sance,	Lillmore tire Dut	: 816-390-45 M	61
Maulyn Jance	Filmore tin Deft.	814 - 390 - 3310 Marilyn Corce D Kotmael. C	lore -
DENUIS FORD	Cosby-Heleur Fire	816-387-3203 DKF02D @BBWI. NET.	
Robert Rowe	Rosendale, Mo 64483	816-244-4998	16
Ray Furt	CON Mulion Country	815 3616441	

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First & Last Name		VIUL LUNGY	Andrew Hoffman	I ester Schulte				

Andrew County Hazard Mitigation Plan Meeting #2 Tuesday, September 8th

Avenue City R-IX Community Gathering August 17, 2015

- 6:00 Welcome and Greeting
- 6:05 Introduction of Board Members
- 6:10 Ribbon Cutting/photo opportunity

6:20 Staff Introductions

6:25 Introduction of Andrew County Officials

- 6:30 Hazard/Mitigation Plan Presentation
- 7:00 Open House
- 8:30 Program Ends

Don Lawrence, Superintendent

Don Lawrence, Superintendent

Rodney Davison, Board President

Becky Grimes, Principal

Don Lawrence, Superintendent

Bob Caldwell, Presiding Commissioner

19 x 21.30=\$404.70

Andrew County's Hazard Mitigation Plan Back to School Night – Avenue City Monday, August 17th

Name	Address	Phone or Email
	111212 MIKTON BIVA	
Brett Luthans	Stroseph, MO 64505	816-261-08.61
Robert Drugs	11948 CO RO 157 SAUAMA MO	816-324-5123
Brenda Davis	15375 Private Dr 3432 54. Joseph, MO 64605	816-244-6139
	15951 Cty Rd 315	
Lisa Simerly	Savannah, mo 64485	816-261.2863
	18950 N.169 Hwy	
Unce Bradley	St Joseph no 64505	816 - 261 - 1776
mich-1- Bradlen	18950 HAN N.169 Huy	816.261-10661
DON CHRISTIE	ST.JOSEPH. NO 64505	816-351-0174
Kraig 3 Jacqui Stites	14441 CO LO 307 ST. DOSEPH MO 64507	816.671.9958
Minditaron Richardsur	19436 Tomahawk Ln St fosoph MO 64505	Be 816 324-7416
Robert Roserr	20YBN order Dogune Savened lowers	816-262-4648
Janis Pargas	12568 Parkview Dr	8/10-21/11-9710
angda - Tom Beam	19788 Sunset Rdg Blvc/ St. Joseph, No 64505	816-662-2065
Mike - Lanice Pantan	15250 Alvate Dr. 3432 St. Joseph MD LUSOS	816-390-5832
CHRIS ANDERSON	(3900 CR 191 SAVANNAH, MO 644385	816-262-1916

P32 14×21.30=298.20

Andrew County's Hazard Mitigation Plan Back to School Night – Avenue City Monday, August 17th

	Name	Address	Phone or Email
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	Romada Ardun	904 S 3rd Ter	
	Derich Orchung	19717 Co Rd 282	
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	gp	19119 Tomahawk Un	
	Beth Forney	51. 50	
	· · · · · · · · · · · · · · · · · · ·	14198 Millstone Blid	
	lim Wilcoxson	St. Jon MO 64505	
	JUSTIN Y BROOKE	16647 STATE RT. O	
	PALMER	ST. JOSEPH, MD 64436	,
	Dana Shipps	19398 N Hwy 169	
		Studenty mobilities	
	CHAD DE ROIN	14279 PARISH DR. ST = JOSEPH, MO	
	E.Lee Clark	14245 Millstone Blud. St. Joseph, MO 64505	
		20715 02306	
	MORK RICHARDEN	57-25587 ma 64505	
	lori Wilson	19454 Tomahawk	
		St Joe, Me 64305	Oribellisen-auxier.com
	Brian Abarr	18:148 Magerild Dr.	
	klin Shi	16550 County Rd 291	
	MIE Slarmer	Cosby MO 64436	
	GARY TURNER	17996 STATE KT D ST JO & 64505	

P93 15 x \$ 21.30=\$ 319.50 TOTAL: 48 hrsxª21.30\$1022.40

Andrew County's Hazard Mitigation Plan Back to School Night – Avenue City Monday, August 17th

Name	Address	Phone or Email
Tyler, Kalcae Schmielt	17671 HWY 169	Kelcee. Schmidte,
Emma & Blake	Cosby MO 64436	Heartland - health. Com
Scott + Kellie Horton	20725 N. Hwy 169	
Cole+Aleigha	St. Joseph, mo 64505	Kulicht emsN.com
AARON Pike	17612 CO Rd 292	814 262 92 74
BRUCE & RAMONA REWLET	16375 Fuest St	
E Jozein	Casey, Mo 64436	816-612-9459
Abe & Beth Forney	19119 Tomahawk LIV St. Joseff MO 64503	816 - 694 - 4413 816 - 838 - 2569
Brenda Hogt	14936 Co. Rd 337	816 294 5565
0 1 2 1	19318 STATE RT W	816 351.2721
Hagela Usborn	Cosby, Mo 64436	MXINXS @Jyahoo, Com
Mackenzie Rowb	N 14298 CORD 351 St. JOSEDN, MO 6450	5876-383-0162
Travis Elifrits	18675 St Rd W Cosp., Mr 64436	816-390-7591
Judy Curry	903 S. 71 Hury. Lavannah MO	(816) 390-3296
SEAN HECKMAN	TES 74 ST RTD COSBY MO 64436	saburn 77@ live, com
		<u> </u>

Andrew County Hazard Mitigation Plan Andrew County Senior Center, Savannah Thursday, October 22, 2015 at 11:15 am Public Meeting

- I. Welcome and Introductions
- II. Background and purpose of the Hazard Mitigation Plan (HMP)
- III. Grants and funding opportunities
- IV. Participation requirements for jurisdictions
- V. Timeline
- VI. What are your concerns?Discussion/feedbackOld Actions in 2011/New Actions in 2016
- VII. How you can help
- VIII. Next Steps
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Andrew County's Hazard Mitigation Plan Public Meeting - Andrew County Senior Center Thursday, October 22, 2015

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Public Meeting - Andrew County Senior Center Andrew County's Hazard Mittigation Plan Thursday, October 22, 2015

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Public Meeting - Andrew County Senior Center Andrew County's Hazard Mittigation Plan Thursday, Octobe

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Andrew County's Hazard Mitigation Plan	Public Meeting - Andrew County Senior Center	Thursday. October 22. 2015

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Andrew County's Hazard Mitigation Plan Public Meeting - Andrew County Senior Center Thursday, October 22, 2015

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	Andrew County's Hazard M Public Meeting - Andrew Coun Thursday, October 23	litigation Plan ıty Senior Center 2, 2015	4 hrs x 31.3 6 miles x -4 5	30:585.20 34=\$3.70
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20.	303 5 3 ONT 12 Sman m	324,3877	4 miles	
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, , , , , , , , , , , , , , , , , , ,	106 1.2 8 1X 83	224- 3883	S Mile	
Elmo Carlos on	3 oc alist bear and b	324-0146	1 mile	
	**	•		
		10+01	× × × × × × × × × × × × × × × × × × ×	のたちやた

34 hrs × #21.30= +01.00



houriy: \$21.30 1 HRX \$21.30 = \$21.30

\$21.30

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Rebuhn Bechett Address: PO Box 196, Amazonia, MO 6442/ Jurisdiction: Amazonia

Date	Hours	Mileage	Activity
12-7-15			Hazard Mitrgatton
			presentation
		۰.	

Mo-Kan

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: George BIRDSONIC Address: P.D. Box 206 400 E. MAINST. SAVANNAH, MO. 64485 Jurisdiction: ANDREW COUNTY EMERGENCY MANAGEMENT

Date	Hours	Mileaġe	Activity
09/08/15	2	2	HMP Meeting
10/08/15	2.5	2.	Him P Work Session (compusiences
08/17/15	2.	/	Meeting is commissioners THEN MEETING @ office
· ·			
		·····	
		·	
	· · · · · · · · · · · · · · · · · · ·		
			· .

Please return form to Rebecca by mail or email (rebecca@mo-kan.org)

•

6.5 hrs x 21.30= 138.45

\$140.70

-45¢ ×5= \$2.25



8-25-15	1	18 Rounding	Meeting
9-7-15	1	· • •	read papers sent by Euroi
10-13-15	1	18 Round	Meeting
• • • • • • • • • • • • • • • • • • •			
	- 100 M		

Please return form to Rebecca by mail or email (rebecca@mo-kan.org)

224 North 7th Street Saint Joseph, Missouri 64501

www.mo-kan.org

	T		6.75 hr × 21. 62 miles × .4	30 = 143.71 5 = 27.9(
<u>_IVIO-k</u>	<u>Nan</u>		(12-23612-26) Not included)	B171.6
가지, 1977년 1978년 1978년 1979년 1979년 - 1979년 br>1979년 - 1979년 1				
	Andrew (County Hazard Volunteer He	Mitigation Plan ours	
Name: Z	Samil 3	remer	2 an Ialo Illa lalla	1102
Address:	14674 4	Co Rd- 186) Rasendan prio 69	
Jurisdiction	Kolen	dale Fire		t ^{ar} a ser
Date	Hours	Mileage	Activity	
12-10-15	1/40		read FEMA Grants IN	1ÃO
12-15-15		44	meet u/Rebecca and went over grant	
12-15-15	2		read three grant infi	2
12-16-45	2		read infor checked info mect up fire chief	on Complu
12-15-15	1		meet w/sheriff & assesso	bor inf.
12-17-15	1/2-	18	gotto and Collected info	
12-23-15			read information	
12-26-15	1		- • •	
	Marry F	Piterman		
	1	ter fall de la fille de la seconda de la fille	그렇게 이 나는 것 같은 것이 같은 것이 같은 것이 가지 않는 것이 있는 것이 가지 않는 것이 없다.	

Please return form to Rebecca by mail or email (rebecca@mo-kan.org)

224 North 7th Street Saint Joseph, Missouri 64501

www.mo-kan.org



 \checkmark

hourly mage \$ 21.30 5.5 hrs × 21.30=117.15

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Gary Chambers, Clerk Address: 6601 N. Belt Hwy, Country Club MO, Jurisdiction: Country Club Village

Date	Hours	Mileage	Activity
11-27-15	Hhours		Administrative Research For Community 940stionaire
12-3-15	12 hours		Discuss Hazard Mitigation Plat with Molt AN Rep
	[
		· ·	
	· · ·		



hourig \$21.30 5.25 × \$21.30 = 118.25 60 m:105×.45¢ = 27.00

\$145.25

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: DENNIS FORD. Address: COSBY Mo. Jurisdiction: COSBY - Heleon FIRZ.

Date	Hours ,	Mileage	Activity
8-25-15	1:45	30	MITIGATION Meeting
9-6-15	1:00		Work on Hmp
9-8-15	l hr	30	mitigation meeting
10-10-15	1:30		review mitration papers
			·

Please return form to Rebecca by mail or email (rebecca@mo-kan.org)

١.,

	hourig: \$21.30 1 hr x 21.30= \$21.30
	$lm \times .45a = .45$
Mo-Kan	\$ 21.75

	Andrew Coui V	nty Hazard Mi olunteer Hou	tigation Plan rs
Name: Be Address: 3 Jurisdiction	CATY of	odwin erry. An Amazon	MAZONIA, MO 64421
Date	Hours	Mileage	Activity
12/7/15	/	1	Discussion Nazara Mitigation
' /			
		· .	
	· · ·		



Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Andrew Hoffman Address: 106 N. 5m Savannah. PO, BOK 271 Jurisdiction: Andrew County Health Dept.

Date	Hours	Mileage	Activity
8.25.15	1.5 h,	3m:	Attending meeting
6.27.15	1,42		Review Data Questionaire
9.2.15	Jur		Review Dara Questionaire.
9.3.15	1.5hr		Review Data Questa
•		20 Capier	2011 GOALS
9.6.15	1,5 hs	lmi	Aftend meeting
10113.15	1.5. 1		review HA chanking
10,13.15	Ihr.	3mi	Attend meeting
	·		



hourig: \$25.00 9 kr x \$25.00 = \$225.00 3m:105 x 45d = \$1.35 \$226.35

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Brue-hundy Address: 402 court St Savannah Mo 64485 Jurisdiction: City of Savannah

Hours	Mileage	Activity
hour	Į III	1st planning meeting
2 hour	SAD 120	rescarch + answer?
2 hour	AU 65	research + answer?
1 hour	1 1	Plannin Martin # 2_
2	idity 100	rescand + answer?
1	1	3rd planning meeting
· ·		· · · · ·
·····		
	Hours 1 hour 2 hour 1 hour 1 1	Hours Mileage I hour My My J hour My My I hour I My 2 1 1 1 1 1 1 1 1 1 1 1 1 1



houriz \$21.30 4 hrsx \$21.30= \$6.20 50 miles x.45&= 22.50 \$107.70

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Johnney D. Neely Address: 186 S 3rd Cosby, Mo. 64436 Jurisdiction: Village of Cosby

Date	Hours	Mileage	Activity
9-8-15	1 hr. meeting	25	Miligation meeting
10-13-15	2 hrs.		Fill out Staplet
10-13-15	Thr. meeting	25	Miligation Meeting
·			·



4 hrs × 321.30= 85.20 50 miles ×.45=225

5107.70

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Teresea Neely Address: 186 53rd St, Cosby Mo 64436 Jurisdiction: Village of Cosby

Date	Hours	Mileage	Activity
9-8-15	1 hr. meeting	\$ - 00 25	pittigation meetin
10-12-15	2 hrs,		fill out staplee
10-12-15	1 hr meeting	- 400-50	mitigation meeting
	/		
		•	
-	<u></u>	· ·	
			· ·
1,			



hourig wage: 525.00 8hrs × 25= \$200.00 220× 454= \$99.00

\$299.00

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Lesley Schulte Address: Jurisdiction: Andrew County Health Dpt.

Date	Hours	Mileage	Activity
08/25/2015	1	37×2	Planning Mito #1
08/31/2015	9:30-10:00 1-1:30		Data Collection Questionnaine
09/03/2015			Data Collection questionname
09/08/2015	6-15-8:45 2.5	37×2	Planning Mtg #2
10/04/2015	1	۰.	Reviewing Tasks to be updated
10/13/2015	1,5	36×2	Planning Mtg. #3

Hourly Rate = 50 per hour 10 hrs x \$ 50= \$ 500.00

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Jim Shultz Address: 9120 HW 48 Rosendale MO 64483 Jurisdiction: North Andrew School District

Date	Hours	Mileage	Activity
8125	2		MO-KAN Meeting
917	2		Documents
10/12	2		Pocuments
10113	2		MO-KAN Meetin
10127	2		Documents
	x		

Please return form to Rebecca by mail or email (rebecca@mo-kan.org)

Mo-Kan

Appendix C: Public Involvement (Part II)

Planning Committee Members Sign-In and In-Kind Documentation Continued

Savannah School District STAPLEE Forms for 8/30/19 Amendments

	//	·			
From				INV	OICE
Andrew Count	y Health Department	· .	ł		
106 North 5th PO Box 271 Savannah, MO	Street 64485				
Го					
Mo-Kan Region	nal Planning		Inv	oice # 041320	16
224 N 7th Street St Joseph, MO 64501		,	Invoic	e Date 04/13/2	2016
			Þu	e Date 04/13/2	01.6
Item	Description	, <i>:</i>	Unit Price	Quantity	Amoun
🕅 Product 🔽	Copies of Andrew County Plan for Board Members	Hazard Mitigation	0.08	2373.00	189.84
🔅 Product 🔽	Postage for malling plan t	o board members	6.80	5.00	34,00
New Line	· .		· · · · ·	.	
Invoice Notes				م بر بر س	N 4
There is no bal County require	ance due, amount is In-Kin d In-Kind amount.	d toward Andrew	Subto	tal	223,84
			Total		223.84
			Amou	nt Paid	0.00
	•		Balan	ce Due	\$223.84

∿.



Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Andrew Hoffman # 20.0%hr, Address: #3to co 106 N, 5 Th Street Savannah 64485-Jurisdiction: Andrew County Health Dept.

Date	Hours	Mileage	Activity
3.31.16	2.0		review HMP & Emails, & resolution
4.11.16	,5		Emails & sesouring
4.12.16	1.5 hr		Copy HMP For board members,
4.13.16	2.0hr		COPY & Mail HMP. To Board members
4,21.16	.5hr		Prepare documents For board meeting
4.26.16	142		Prepare & Present To locard,
4,27,16	,sh,		Prepare & Send resolution.



houring wago = # 21,30 \$21.30 × 1 hr= \$21.30 -454 x 2mi = -90 a. 22.20

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Bob HAYNES Address: 6322 GLENDALE RA Jurisdiction: COUNTRY CLUB VILLAGE

Date	Hours	Mileage	Activity
4/12/16	1	2,00	meeting



hourig wage * 21.30 \$ 21.30 × 2h= * 21.30 .45 × 3mi= 1.35 \$ 22.65

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Charlie Potts Address: 9520 County Rd 427 Jurisdiction:

Date	Hours	Mileage	Activity
4-18-16		3	meeting



Country (146, Mo 64506

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Mack SINCHAIR
Address: 12460 Ake lower Do
Jurisdiction: Country Club Villard

Date	Hours	Mileage	Activity
4-12-16	/	, 50	Meeting
,			



hourig wage : \$ 21.30 121.30×1= 521.30 .45×4= \$ 1.80 523.10

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Daniel Brewer Address: Jurisdiction: Rosendale Fire Rist.

Date	Hours	Mileage	Activity
5-2-16	1	4	Board meeting



Andrew County Hazard Mitigation Plan Volunteer Hours

Name: David Potter Address:

Jurisdiction: Rosendale Fire Dist

Date	Hours	Mileage	Activity
5-2-16)	10	Bd m+g
			0



\$25.25 hourly wage :

\$25.25

\$25.25×1hr=

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: David	Vincent	
Address: 308	N 8th	Savannah, Mo
Jurisdiction:	rty of	Savannah

Date	Hours	Mileage	Activity
4-18-16			meeting
		an	



Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Emily M. Bauman Address: 9511 CK 461 Savannah MO 64485 Jurisdiction: Savannah

Date	Hours	Mileage	Activity
4-18-14	l	3.0	meeting
			U



houry wage: \$ 21.30 \$21.30×1= \$21.30 \$45 x 2= \$ 90 12230

Andrew County Hazard Mitigation Plan **Volunteer Hours**

Name: Samp Littman Address: Jurisdiction: Rosendale Fine Dist

Date	Hours	Mileage	Activity
5/2/16	1 m.	2 mb	Board Meeting
			~



houring wage: \$21.30 $$21.30 \times 3=63.90 $.45 \times 1 = .45$ \$64.35

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: George Biridson/G Address: Strannah, Mo. Jurisdiction: EMERGENCY MANAGEMENT

Date	Hours	Mileage	Activity
4-25-16	3	1	REVISIONS TO Mitigation Pin



hourig wage: \$21.30 \$21.30 × 1 hr = \$21.30 •45¢ × 18 mi = \$8.10 \$39.40

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: James Galbraith Address: P.O Box 27 Reg MO 64480 Jurisdiction: Road and Bridge Supervisor

Date	Hours	Mileage	Activity
4-11	1	13	



houriy Abge: \$21.30 \$21.30 × 15 \$21.30 -450 × 21.6mi=9.72 \$31.02

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Jason Tolen Address: 1120 Hwy 48 Jurisdiction: North andrew Schools

Date	Hours	Mileage	Activity
4-15-16		21.6	HMP at North andrew School Board Neethy
	· · · · · · · · · · · · · · · · · · ·		


Andrew County Hazard Mitigation Plan
ر المراجع Volunteer Hours
Name: Jeanne Pierson Address: PD Box 6 Barnard MO 64423 Jurisdiction: North Andrew RVI

Date	Hours	Mileage	Activity
4-15-16		15	Honf meeting at North Andrew Board Meetin



Name: Bring Brung Address: 60757+H Jurisdiction:

Date	Hours	Mileage	Activity
41-18-6	1	5	
,			



Name: Jim Shutle Address: 900 wo Main Savannah, MO 64485 Jurisdiction: North Andrew

Date	Hours	Mileage	Activity
4115116	1	20	HMP Meeting at North Andreso School Board Meetin
-			
		+	



Name: KAREN SPARKS	
Address: 1 Ridseland Rd Counter Ollo	Λ
Jurisdiction:	16
Country Club, My	

Date	Hours	Mileage	Activity
4-12-16		,25	Mecting
		L	



hourig wage: \$ 21.30 \$ 21.30x1 hr = \$ 21.30 \$ 21.30 x1 hr = \$ 21.30 \$ 42.60

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Kathy Rooch				
Address: 176 Bean	At	Rea,	Mo	64480
Jurisdiction: Ulling of	lea	·		

Date	Hours	Mileage	Activity
5-3	1		type resolution
			<i>)</i>
5-9	1		board meiting
			5



Name: Kenny LANCE Address: 306 N Beech Jurisdiction: CITY of SAVANNAH

Date	Hours	Mileage	Activity
14-18-16	1	. 5	meeting
to the	184		
L	I	J	I



hourig wage: \$21.30 8 21.30 × 1 hr= \$21.30 -45 × 12mi. = \$5.40

\$26.70

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Kristin Rasnic Address: 425W. Hibbard SI. Fillmore, MO Jurisdiction: North andrew

Date	Hours	Mileage	Activity
			HMP at
4-15-16	1	12miles	NA School Board Meeting



Name: Larry Sparks Address: 1 Ridgeland Rd, Country Club, MD Jurisdiction: Country Club, MO

Date	Hours	Mileage	Activity
1-12-16	/	.25	Mecting
			1



hourig wago: \$21.30 \$21.30 × 1 kr = \$21.30 • 45¢ × 22mi = 9.90 \$31.30

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Mark McDanrel Address: 5151 Strate RI. D Rea MO 64480 Jurisdiction: North Andrew

Date	Hours	Mileage	Activity	
4-15-16	1	22	1-1 MP @ North Andrew School Bo	(1 भर 1
			/Neet	۳. ``
1				



hourig wage: \$ 21.30 \$ $21.30 \times 1 \text{ hr} = $ 21.30$ $.45 \times .5 \text{ mi} = 23$ \$ 21.53

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: MAdthow Emman Address: Go, w. MAM St. Jurisdiction: C/4 OF Savanutt

Date	Hours	Mileage	Activity
4.18.16	1	, 5	Meetru
			`



Name: Melissa, Thorburn
Address: 285 N. Cross Fillmore MO 64449
Jurisdiction: Andrew County Clurks Office

Date	Hours	Mileage	Activity
4/11/16	Ihr.	32	HMP Adoption
			· · · ·



Name: mike Barton

Address: Jurisdiction: Rosendace mo

Date	Hours	Mileage	Activity
5-2-16	/	· · · · · · · · · · · · · · · · · · ·	Board meeting
,			

Please return form to Rebecca by mail or email (rebecca@mo-kan.org)

hourig wage : 521.30



hourig wage: 521.30 521.30x 1 hr= 521.30 -45 x 21 mi=

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Paula Richter
Address: 17262 CR 324, Savannah MO 64485
Jurisdiction: Andrew County ClerKS Office

4-11-2016 1 21 Hmp Adoption	
· · · · · · · · · · · · · · · · · · ·	



Name: Roger Dafford Address: 12898 Country PI Dr Jurisdiction: Country Club Uillage

Date	Hours	 Mileage	Activity		
04-12-16	1	,25	Country	Club	meeting



hourig wage: #21.30 #21.30 x 3= #63.90

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Kogen LatHAMe Address: SAUNDOM

Jurisdiction: Andrew Come 5

Date	Hours	Mileage	Activity
4/25/10	Shere		Plan revisions & wardate
	1		



hourly rate: \$ 21.30 \$ 21.30 × 1 hr= \$ 21.30 - 45d × 3.5 mi= \$ 1.58

88.268

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: Ruth Riedinger Address: 10 211 Co Rd 142 Bolekow, M& 64427 Jurisdiction: North Adrew

Date	Hours	Mileage	Activity
4-15-16	lhr	3.5 miles	H. M. P. @ North Andrew School board nf
			······································
L			



Name: Teresa	Kidwell				
Address: 3101	Jennifer Ln	Country	Club,	mo	64506
Jurisdiction:	Country Club	Village			
	Ŧ	0			

Date	Hours	Mileage	Activity
4-12-16		150	Meeting
4			ð



Name: Teresea Neely Address: 186 5 3rd St., Coeby Mo 64436 Jurisdiction: Cosby

Date	Hours	Mileage	Activity
5-1-16 5-2-16	15 min		typing - making Copies of resolution present resolution to trustee at board meeting
	•		
	-		



Name: Willa TRIMMER Address: 17971 NWY 48 Rea, MO Jurisdiction: REPN

Date	Hours	Mileage	Activity
5-2-16	/	12	Board Meeting
,		i	



hourig wage: \$21.30 $$21.30 \times 2$ hr = \$21.30 $.45d \times .25mi = -11$

\$ 21.41

Andrew County Hazard Mitigation Plan Volunteer Hours

Name: William & Washington, JN Address: 12889 COUNTIVI PLACE OR Jurisdiction: COURTRY CLUB VIL

Date	Hours	Mileage	Activity
4-12-16	t	.25	Meeting
			, ,
,			

			Phone (Emeil	
	First & Last Name	Address	Stu 2015093	
` ×	TIM Miller	5801 CR 135 Rosendele	tw Onillemen.com	ć
			piersonenorthandrew.o	ero
	Sternetieven	10 tax 6 Bernard 64423	816.383-2241	
			816-324-0153	
	J'M Shaftz	9120 HW 48 Rosendale MD 64483	ishult 2 QNarthendres. 015	
ر َ		Chult in an an and the	01 /6	
2	CHILL TOWCLEY	1440 MW.4 1 1 Kasentuli 1110 01103	Rowald 10 100 mon 1.00 m	
×	Lule Afree	6842 Can R. 40 Karali 100 64433	216-432-2053	
			816-567-2018	
×	Linow Holt	9227 Country Ka- 71 Kosendele. n. 0 4: 10)	lindy hoff Chotwail. com	
			(814)567-4023	
×	Jennifer Graham	RJ48 CR 57 Rosendale MO 64483	L'fuckarahame uahoe com	Z
			811-540-12340	
X	Steve Houston	9649 C.R. 149 SniAnnah MO 64485		
	(816-390-7583	
	'tuth tiedinger	10211 (2 Rd 142 Bolckow MD (442)		
	2			
	Mart Mesa in	5/51 State 24. D Rea MO 64480	(Siv) 639-3596	
	10500 TOLEN	9120 Hwy HS Rosendale MO 64483	816 567 2525	
	Kristin Rasmic	425 W. Hibbard St., Filmore, MO UY449		
			819.70-000	

Andrew County Hazard Mitigation Plan North Andrew School District – School Board Meeting Tuesday, April 15, 2016

ANDREW COUNTY HEALTH DEPARTMENT BOARD OF TRUSTEES

Notice of open meeting and vote to close part of the meeting Posted April 22, 2016 at 12:30 p.m. (Parliamentary Procedure According to Robert's Rules of Order.) Meeting Date April 26, 2016 – 5:00 p.m. at Andrew County Health Department 106 N 5th Savannah, MO

ORDER OF BUSINESS

a.

a.

- 1. Meeting is called to order
 - a. Approve Agenda
- 2. Reading of the Minutes
 - Approval of the March 29, 2016 Minutes
- 3. Oath of New Trustees
 - Fritz Hegeman and Janice Krull were sworn in April 12th, Roxanne Fisher was sworn in April 15, 2016 by Andrew County Clerk Sarah Miller at the Andrew County Courthouse.
- 4. Election of Officers
 - a. Chairperson
 - b. Vice Chairperson
 - c. Treasurer
 - d. Secretary
- 5. New Business:
 - a. Review of Andrew County Hazard Mitigation Plan by Rebecca Thacker, Community Development Planner with Mo-Kan.
 - b. Vote on adoption of Andrew County Hazard Mitigation Plan by resolution.
 - c. Workers Compensation bid
- 6. Vote to close meeting to reconvene later
- 7. Closed meeting per 610.021 (1)
- 8. Financial Review
 - a. Approval of bills
 - b. Financial report
- 9. Staff Reports:
 - a. Nursing Report- McKinzie Wandfluh
 - b. Environmental Report Jessica Bowman
 - c. Health Educator Report Malinda Ehrhardt
 - d. Administrator Report Andrew Hoffman
- 10. Old Business:
 - a. Universal Service Administration Company Application (Solix Proposal)
 - b. Update Board Books with new Policies
 - c. LAGERS retirement information
 - d. Health Department Credit Card
- 11. Public Comment
- 12. Announcements –May 24, 2016 Board Meeting time.
- 13. Adjournment

NORTH ANDREW R-VI SCHOOL DISTRICT

Bolckow, Fillmore, Rea, and Rosendale, Missouri

Board of Education Meeting ***Reorganizational followed by the Regular Meeting***

> at the North Andrew School at 6:30 in the ITV Room

Friday, April 15, 2016

BOARD OF EDUCATION GOALS

Established 9-4-97 goal setting meeting Revised 8-2015

- Recruitment and retention of qualified personnel that strive to meet North Andrew's expectations of excellence
- Carryover Balance- Reach and maintain a reserve balance of 25% or greater
- School district will meet APR Annual Performance Report on all state assessment levels
 - Long Term evaluate scores in September and review goals in October
- Maintain low dropout rate of no more than 3% and a high daily attendance of at least 96%
 - Report in month of October
- Establish and maintain a high level of discipline and respect within the student body
 - Report in January and June
- Plan and implement facility recommendations to address district needs for continued improvement
 - Report in December Facility Committee recommendations
- Continue to explore and implement enhanced educational opportunities for our district
 - Update in November and June

The North Andrew School District, believing all students can learn, will work together to provide a safe, orderly environment in which all students will learn, develop their potential and become responsible members of a global society.

"Are the decisions made in this meeting in the best interest of our district, students and staff?"



NORTH ANDREW R-VI SCHOOL DISTRICT BOARD OF EDUCATION AGENDA

Reorganization and Regular meeting at Rosendale, Mo in the ITV Room Friday, April 15, 2016 at 6:30pm

Posted	Ву
4-7-16	JMP

I. Roll Call by Secretary

II. New Business

- 1. Certification of election results. (Attachment #1)
- 2. Oath of Board members.
- 3. Election of officers.

> Regular Meeting Agenda

III. MSBA monthly update http://www.msbanet.org/

IV. Financial and Legislative Summary

V. Consent Agenda

- 1. Approve minutes of previous meeting. (Attachment #2)
- 2. Payment of Bills (Attachment #3) Payroll (Net) \$125,951.86 Payroll Withholding (Income Tax, Soc Sec, Retire) \$76,521.04 Incidental \$120,191.68 Debt Service Total Expenditures \$322,664.58
 3. Set next months maching for Wednesday, May 18, 2016 at 6120 mm
- 3. Set next months meeting for Wednesday, May 18, 2016 at 6:30pm.
- 4. Evaluation reviews in May: Industrial Arts Program and Professional Development Plan.

VI. Communications

- 1. MSBA Region 1 meeting Monday, April 25, 2016, 6:00pm at South Nodaway School District.
- 2. Finalize T.A.B. (Teacher, Administrator and Board) meeting Wednesday, May 4, 2016 at 4:00pm. Topic – Open agenda and School Climate survey.

VII. Old Business

1.

VIII. New Business

- 1. Hazard Mitigation Plan. (*Attachment #4*)
- 2. Evaluate Discipline Policy (Attachment #5)
- 3. Employment of the non-certified staff. (Handout) (Executive Session)
- 4. Extra duty assignments. (Handout) (Executive Session)
- 5. Health Insurance rates. (Handout)

"Are the decisions made in this meeting in the best interest of our district, students and staff?"

(continued) NORTH ANDREW R-VI SCHOOL DISTRICT BOARD OF EDUCATION AGENDA

Reorganization and Regular meeting at Rosendale, Mo in the ITV ROOM Friday, April 15, 2016 @ 6:30pm

VIII. New Business (continued)

- 6. School climate survey. (*Attachment* #6)
- 7. Evaluate Business Program. (*Attachment* #7)
- 8. Letters of resignation and positions to open. (Handout)
- 9. Positions to fill. (Executive session)
- 10. Patrons to address the Board. (Executive session)
- 11. Bid out Chrome books for 2016-2017. (Handout)

IX. Principals' Reports (Attachment #8)

X. Superintendent's Report

- XI. Executive Session In Accordance To Section 610.021, Sub-sections 3, 13 and 14. (3) Hiring, firing, disciplining or promotion of Personnel.
 - (13) Individually identifiable personnel records.
 - (14) Records protected by law

NORTH ANDREW R-VI SCHOOL DISTRICT Reorganizational Meeting followed by Regular Board of Education meeting Held Friday, April 15, 2016, at 6:30pm in the ITV Room at Rosendale, MO

Present: Jeff Powelson, Lindy Holt, Rodney Cole, Lyle Officer, Jennifer Graham, Steve Houston and Tim Miller; Superintendent – Jim Shultz; Principal – Jason Tolen and Mark McDaniel; Secretary/Treasurer – Jeanne Pierson; Visitors – Mr. and Mrs. Davis, Kristen Rasnic and in coming Board Member Ruth Riedinger.

Absent:

Rodney Cole made the motion to approve the Board election results. Motion was seconded by Tim Miller and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Rodney Cole, Jenny Graham, Steve Houston and Tim Miller.

At this time the current Board disband and Mr. Shultz conducted the meeting at this time. Rodney Cole was recognized for his 9 years of service to the North Andrew School District.

At this time Jeanne administered the oath of office to the newly elected Board members: Lyle Officer and Ruth Riedinger.

Mr. Shultz asked for nominations for Board President: Lyle Officer nominated Jeff Powelson for Board President.

Lindy Holt made the motion for nominations to cease. All those in favor of Jeff Powelson for Board **President** members in favor of the motion: Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham, Steve Houston and Tim Miller. Abstained: Jeff Powelson.

Jenny Graham nominated Lyle Officer as Vice-President.

Lindy Holt made the motion for nominations to cease. All those in favor of Lyle Officer for Board Vice-President members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham, Steve Houston and Tim Miller.

Lyle Officer made the motion to re-appoint Jeanne Pierson as Board secretary. Motion was seconded by Steve Houston and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham, Steve Houston and Tim Miller.

Lyle Officer made the motion to re-appoint Valerie Atkins as Board treasurer. Motion was seconded by Steve Houston and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham, Steve Houston and Tim Miller.

Lyle Officer made the motion to amend the agenda to move executive session up to the beginning of the meeting. Motion was seconded by Jenny Graham and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham, Steve Houston and Tim Miller.

Lyle Officer made the motion to go into executive session in accordance to section 610.021, sub-section 14. Motion was seconded by Tim Miller and passed. Roll call was taken and members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham, Steve Houston and Tim Miller. At this time Kristen Rasnic left the meeting. Lyle Officer made the motion to come out of executive session. Motion was seconded by Ruth Riedinger and passed. Roll call was taken and members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham, Steve Houston and Tim Miller.

Tim Miller left at this time. Kristen Rasnic came back in to the meeting.

Lindy Holt made the motion to approve the consent agenda. Motion was seconded by Lyle Officer and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

The MSBA Region 1 meeting is Monday, April 25, 2016, 6:00pm at South Nodaway School District – roll call count to register: Jeff Powelson, Lindy Holt, Lyle Officer and Jim Shultz.

The Teacher, Administrator and Board meeting (T.A.B) will be moved to Monday, May 9, 2016 at 4:00pm.

The Hazard Mitigation Plan was reviewed. Mr. Powelson read the resolution.

Lindy Holt made the motion to approve the Hazard Mitigation Plan. Motion was seconded by Steve Houston and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

Ruth Riedinger made the motion to evaluate the Discipline Policy. Motion was seconded by Steve Houston and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

Employment of the non-certified staff was moved to executive session.

Extra duty assignments were moved to executive session.

Lindy Holt made the motion to approve the MEUHP Agreement and accept the Health Insurance Plans and rates. Motion was seconded by Lyle Officer and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

The school climate survey was reviewed and discussed at this time.

Lindy Holt made the motion to approve the school climate survey. Motion was seconded by Lyle Officer and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

Lindy Holt made the motion to approve the Business Program evaluation. Motion was seconded by Ruth Riedinger and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

Jenny Graham made the motion to accept Karissa Hill's letter of resignation. Motion was seconded by Lyle Officer and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

Lindy Holt made the motion to accept Cindy Clement's letter of resignation. Motion was seconded by Lyle Officer and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

file:BOEminutes.doc

Jenny Graham made the motion to open a K-12 Band position and MS Science position. Motion was seconded by Ruth Riedinger and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham, Steve Houston.

Jenny Graham made the motion to bid out Chrome books for the 2016-2017 school year. Motion was seconded by Lindy Holt and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

Principals' reports were reviewed.

Superintendent's report – retirement reception prior to the next Board meeting May 18; new utility vehicle.

Lyle Officer made the motion to go into executive session in accordance to section 610.021, sub-sections 3, 13 and 14. Motion was seconded by Lindy Holt and passed. Roll call was taken and members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham and Steve Houston.

*****EXECUTIVE SESSION MINUTES ARE KEPT UNDER SEPARATE COVER******

Tim Miller returned to the meeting at this time and back into the minutes as recorded.

Lindy Holt made the motion to adjourn. Motion was seconded by Tim Miller and passed. Members in favor of the motion: Jeff Powelson, Lyle Officer, Lindy Holt, Ruth Riedinger, Jenny Graham, Steve Houston and Tim Miller.

Date

Secretary

President



North Andrew R-VI School District

North Andrew School District

Board of Education

Board Agenda Board Of Education On-Line Policy



President Jeff Powelson

Vice President Lyle Officer

Members

Rodney Cole Jenny Graham Lindy Holt Steve Houston Tim Miller

Tentative Board Meeting Dates 2015-2016

Wednesday, July 15 Thursday, August 20 Wednesday, September 16 Wednesday, October 21 Wednesday, November 18 Wednesday, December 16 Wednesday, January 20 Wednesday, February 17 Wednesday, February 17 Wednesday, March 16 Wednesday, April 20 Wednesday, May 18 Wednesday, June 15

BOE Program Evaluation Calendar

Andrew County Commissioner's Meeting – Courthouse, Savannah, MO Andrew County Hazard Mitigation Plan Monday, April 11, 2016

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Address	19726 Quint	P.O. Box 27 Red	5801 UR135, Rosin	PO BOX 206 Sonannuh, M	295 N. Cross Fi	17262 Courty Rd324,	
First & Last Name	Ray Furt	Jimes Gilbraith	Caran miller	Dorry Howard	MelissA Thorburn	Paula Richter	

Village of Cosby Hazard Mitigation Plan Meeting Monday, May 2, 2016

First & Last Name	Address
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Rosendale Fire District Hazard Mitigation Plan Meeting Monday, May 2, 2016	Address	14674 Co. Rd. RU Roundale	@ 17971 Huin 48 Rea	6150 CORD. 179 Rosendare Mo.	3697 GR8 136 BOICKON, MO	5120 0, Rd 170 Rosen Lale . M. 64483			
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Name	Address (Street, City or Company Name)
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TENTATIVE SAVANNAH CITY COUNCIL AGENDA MONDAY, APRIL 18, 2016 7 P.M. CLASBEY CENTER – COUNCIL CHAMBERS

Pledge of Allegiance

Call meeting to order - Roll Call

Approve Agenda

Minutes – April 4, 2016

Public – **Public Testimony:** Speaker state name, address and subject. A maximum of five (5) minutes of testimony will be accepted from each speaker.

City Administrator's Report

Police Chief's Report

City Attorney's Report

RESOLUTIONS FOR CONSIDERATION

Resolution 2016-2 Andrew County Hazard Mitigation Plan

BILLS FOR CONSIDERATION:

Bill 2016-10 Election Results – First and second readings, consider passage

Bill 2016-11 Sidewalks- First and second readings, consider passage

Bill 2016-12 Bidding Policy – First and second readings, consider passage

Second Public Testimony: Speaker state name, address and subject. A maximum of five (5) minutes of testimony will be accepted from each speaker.

ELECTED OFFICIALS

Mayor's report Council discussion

ADJOURNMENT

Adjourn Sine Die

Agenda City of Fillmore Council Meeting At Lincoln Lodge Building Tuesday, May 3, 2016 at 7:00 PM

Approve April minutes Old Business: Accept election certification Swearing-in of elected. Hazard Mitigation Plan Dumpster rental **New Business:** Jimmy Smith report on water/sewer Approve monthly sewer report Open discussion items by council members Approve payment of bills: Water Dept. balance: \$25,528.78 \$100.00 **City of Fillmore Maintenance** UMB (Taxes withheld) 298.94 Bob Lance (Salary) 158.15 Jimmy Smith (Water Operator pay) 365.34 PWSD #3 1,708.80 KCP&L (Water tower, east p.s.) Pending Prior month: \$191.42 Sewer Dept. balance: \$3,299.68 Bob Lance (Salary) \$158.15 **Depreciation/Replacement Fund** 74.17 Jimmy Smith (Wastewater salary) 406.84 Jimmy Smith (Extra WW pay) 37.51 Rob Daniels (Mowing lagoon site) 175.00 Fillmore Water Dept. (Reimb) 735.00 KCP&L (2 pump stations) Pending Prior month: \$59.79 City of Fillmore balance: \$47,224.44 Bob Lance (Salary) \$316.30 Porter Trash (trash pickup) 599.00 Porter Trash (dumpster rental) Pending Nadine Messick (mow school yard) 270.00 NW Insurance (bond renewal) 200.00 County Clerk (election expenses-bal.) 2.38 KCP&L (Street lights, concrete bldg) Pending Prior month: \$609.11 Savings Acct. Balances: City \$11,874.93 \$ 8,975.45 Debt

Depr/Rep \$ 1,660.09
Notice is hereby given that the City of Fillmore will conduct a council meeting at 7:00 p.m. on Tuesday, May 3, 2016 at the Lincoln Lodge Building

The tentative agenda of this meeting includes:

Reading of Minutes Old Business New Business Jimmy Smith's Reports Open Discussion Monthly Reports Payment of Bills Adjournment

The Andrew County Hazard Mitigation Plan will be discussed and adopted at the meeting.

Representatives of the news media may obtain copies of this notice by contacting:

Bob Lance, City Clerk P.O. Box 117 Fillmore, MO 64449 Phone 816-565-0792

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PUBLIC NOTICE

The Village of Rea will have a public meeting to go over the Andrew County Hazard Mitigation Plan and to vote to adopt the plan.

> This meeting will be held at the Rea Union Church May 4, 2016 7:00 p.m.

Posted:

Rea Post Office Platte Valley Ag Rea Union Church

		1.1.20
R	Action Worksheet	
Name of Jurisdiction:	Savannah B3 School District – Savannah High S Action of Project	School
	Risk / Vulnerability	
Name of Action or Project:	Safe Room for Savannah High School	
Mitigation Category:	Prevention Objective 1: 1 – Protect citizen's lives and proper	ty
STAI Eval Definitely YES Probably NO =	PLEE Criteria uation Rating = 3 Maybe YES = 2 1 Definitely NO = 0	Score
S: Is it Socially Acceptable		3
T: Is it Technically feasible and potenti	ally successful?	3
A: Does the jurisdiction have the Admi	nistrative capacity to execute this action?	3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement	nt?	3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral or positive impact on the natural Environment ?		3
Will historic structures be saved or pro	tected?	3
Could it be implemented quickly?		3
	STAPLEE SCORE	27 and she that a she she she she
Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives will be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
	MITIGATION EFFECTIVENESS SCORE	20
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	47

High Priority
(30+ points)

Medium Priority
(25 - 29 points)

(<25 points)

Completed by

(Name, Title, Phone Number)

Dr. Eric Kurre, Superintendent, (816) 324-3144

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Problem being Mitigated:	Inadequate shelter for community, students and staff during a tornado or severe thunderstorm/wind event	
Hazard(s) Addressed:	Tornado, Severe Thunderstorm/Wind Events	
	Action or Project	
Action/Project Number:		
Name of Action or Project:	Safe Room for Savannah High School	
Action or Project Description:	Construction of a safe room that serves a dual purpose as a gym.	
Applicable Goal Statement:	Objective 1:1: Protect our citizen's lives and property	
Estimated Cost:	1,500,000	
Benefits:	Protect lives	
	Plan for Implementation	
Responsible Organization/Department:	Savanah R3 School district	
Action/Project Priority:	High	
Timeline for Completion:	2 – 2.5 year	
Potential Fund Sources:	Grants, Internal, State, Federal, Match	
Local Planning Mechanisms to be Used in Implementation, if any:	Tornado Safe rooms included in Board of education's building safety plans	
	Progress Report	
Action Status	New	
Report of Progress		

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	Action Worksheet	
Name of Jurisdiction:	Savannah R3 School District – John Glenn Elen Action of Project	nentary
A	Risk / Vulnerability	
Name of Action or Project:	Safe Room for John Glenn Elementary	
Mitigation Category:	Prevention Objective 1: 1 – Protect citizen's lives and prope	rty
STA Eva Definitely YES Probably NO =	PLEE Criteria luation Rating = 3 Maybe YES = 2 = 1 Definitely NO = 0	Score
S: Is it Socially Acceptable		3
T: Is it Technically feasible and potent	ially successful?	3
A: Does the jurisdiction have the Adm	inistrative capacity to execute this action?	3
P: Is it Politically acceptable?		3
L: Is there Legal authority to impleme	nt?	3
E: Is it Economically beneficial?		3
E: Will the project have either a neutri Environment?	al or positive impact on the natural	3
Will historic structures be saved or pro	stected?	3
Could it be implemented quickly?		3
	STAPLEE SCORE	27
Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives will be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
	MITIGATION EFFECTIVENESS SCORE	20
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	47

High Priority Medium Priority Low Priority (<25 points) (30+ points) (25 - 29 points)

Completed by

(Name, Title, Phone Number)

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Dr. Eric Kurre, Superintendent, (816) 324-3144

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Problem being Mitigated:	Inadequate shelter for community, students and staff during a tornado or severe thunderstorm/wind event	
Hazard(s) Addressed:	Tornado, Severe Thunderstorm/Wind Events	
	Action or Project	
Action/Project Number:		
Name of Action or Project:	Safe Room for John Glenn Elementary	
Action or Project Description:	Construction of a safe room that serves a dual purpose as a multipurpose room & gym.	
Applicable Goal Statement:	Objective 1:1: Protect our citizen's lives and property	
Estimated Cost:	1,200,000	
Benefits:	Protect lives	
	Plan for Implementation	
Responsible Organization/Department:	Savanah R3 School district	
Action/Project Priority:	High	
Timeline for Completion:	2 – 2.5 year	
Potential Fund Sources:	Grants, Internal, State, Federal, Match	
	and the second	
Local Planning Mechanisms to be Used in Implementation, if any:	Tornado Safe rooms included in Board of education's building safety plans	
	Progress Report	
Action Status	New	
Report of Progress		

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	Action Worksheet	
Name of Jurisdiction:	Savannah R3 School District – Minnie Cline El Action of Project	ementary
A	Risk / Vulnerability	en an an an Arabin (an Arabin) an Arabin (an Arabin) An Arabin (an Arabin) an Arabin (an Arabin) an Arabin (an Arabin) An Arabin (an Arabin) an Arabin (an Arabin) an Arabin (an Arabin)
Name of Action or Project:	Safe Room for Minnie Cline Elementary	
Mitigation Category:	Prevention Objective 1: 1 – Protect citizen's lives and prope	rty
STA Eval Definitely YES Probably NO =	PLEE Criteria uation Rating = 3 Maybe YES = 2 1 Definitely NO = 0	Score
S: Is it Socially Acceptable		3
T: Is it Technically feasible and potenti	ally successful?	3
A: Does the jurisdiction have the Adm	inistrative capacity to execute this action?	3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement	nt?	3
E: Is it Economically beneficial?		3
E: Will the project have either a neutra Environment?	I or positive impact on the natural	3
Will historic structures be saved or pro	tected?	3
Could it be implemented quickly?		3
	STAPLEE SCORE	27
Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives will be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages	10
and a second second second	MITIGATION EFFECTIVENESS SCORE	20
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	47

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High Priority Medium Priority Low Priority (30+ points) (25 - 29 points) (<25 points)

Completed by

(Name, Title, Phone Number)

Dr. Eric Kurre, Superintendent, (816) 324-3144

Problem being Mitigated:	Inadequate shelter for community, students and staff during a tornado or severe thunderstorm/wind event
Hazard(s) Addressed:	Tornado, Severe Thunderstorm/Wind Events
	Action or Project
Action/Project Number:	n na series and an
Name of Action or Project:	Safe Room for Minnie Cline Elementary
Action or Project Description:	Construction of a safe room that serves a dual purpose as a multipurpose room & gym.
Applicable Goal Statement:	Objective 1:1: Protect our citizen's lives and property
Estimated Cost:	1,200,000
Benefits:	Protect lives
and a second br>The second sec	Plan for Implementation
Responsible Organization/Department:	Savanah R3 School district
Action/Project Priority:	High
Timeline for Completion:	2-2.5 year
Potential Fund Sources:	Grants, Internal, State, Federal, Match
Local Planning Mechanisms to be Used in Implementation, if any:	Tornado Safe rooms included in Board of education's building safety plans
	Progress Report
Action Status	New
Report of Progress	(1) The first of a standard standar Standard standard stand Standard standard stand Standard standard st Standard standard st Standard standard st Standard standard stand Standard standard st Standard standard stand Standard standard stand Standard standard st Standard standard stand Standard standard standard sta

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	STAPLEE Worksheet	and the second second second
Name of Jurisdiction:	Bolckow, Mo	
	Action or Project	
Action/Project Number:	(leave blank)	
Name of Action or Project:	Tornado siren system for Bolckow, Mo	
Mitigation Category:	Prevention Objective 1: 1 – Protect citizen's lives and property	
STAI Eval Definitely YES Probably NO =	PLEE Criteria uation Rating = 3 Maybe YES = 2 1 Definitely NO = 0	Score
S: Is it Socially Acceptable		3
T: Is it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the Administrative capacity to execute this action?		2
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral or positive impact on the natural Environment?		0
Will historic structures be saved or protected?		2
Could it be implemented quickly?		3
	STAPLEE SCORE	21
Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives will be saved.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	8
	MITIGATION EFFECTIVENESS SCORE	16
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	37

(Name Title Rhone Number)	2144
Completed by	Havley Heward, Community Planner, 816, 232
High Priority (30+ points)	Medium Priority (25 - 29 points) Low Priority (<25 points)

and the second	
	Action Worksheet
	The second s
Name of Jurisdiction:	Bulckow, Mo
	Risk / Vulnerability
Problem being Mitigated:	Nonexistent warning system for residents of an impending tornado
Hazard(s) Addressed:	Tornado Savara Thunderstorm/Wind Evants
Hazaru(s) Aduresseu;	
	Action or Project
Action/Project Number:	(leave blank)
Name of Action or Project:	Tornado siren system
and the second	Installation of siren system that will alert residents of an impending tornado
Action or Project Description:	
Applicable Goal Statement:	Objective 1:1: Protect our citizen's lives and property
Estimated Cost:	\$20,000
Benefits:	Protect lives
	Plan for Implementation
Responsible	Bolckow City Council
Organization/Department:	
Action/Project Priority:	high
Timeline for Completion:	6 months
Potential Fund Sources:	Grants, Internal, State, Federal, Match
Local Planning Mechanisms to	
be Used in Implementation, if	
any:	
anna 2017 a shekara ta shekara 1997 ya shekara 1997 ya Marika Shekara ta shekara ta shekara ta shekara ta shek Marika shekara ta shekar	Progress Report
Action Status	New
Report of Progress	(leave blank)

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	Cosby, Mo	
Name of Jurisdiction:		
	Action or Project	
Action/Project Number:	(leave blank)	
Name of Action or Project:	Tornado siren system for Cosby, Mo	
Mitigation Category:	Prevention Objective 1: 1 - Bretest sitizen's lives and proper	
Ceta	DISE Critoria	
Eval Eval Definitely YES Probably NO =	uation Rating = 3 Maybe YES =:2 1 Definitely NO = 0	Score
S: Is it Socially Acceptable		3
T: Is it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the Administrative capacity to execute this action?		2
P: Is it Politically acceptable?	P: Is it Politically acceptable?	
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral or positive impact on the natural Environment?		0
Will historic structures be saved or pro	tected?	2
Could it be implemented quickly?		3
	STAPLEE SCORE	21
Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in	Assign from 5-10 points based on the	8
Will the implemented action result in	Assign from 5-10 points based on the relative	8
a reduction of disaster damages?	reduction of disaster damages.	16
· .	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	3/

(30+ points)	(25 - 29 points)
Completed by (Name, Title, Phone Number)	Hayley Howard, Community Planner, 816-233- 3144

and a second	
	Witon Wolksheit Assessment
	and the second secon
Name of Jurisdiction:	Cosby, Mo
	Risk / Vulnerability
Problem being Mitigated:	Nonexistent warning system for residents of an impending tornado
Hazard(s) Addressed:	Tornado, Severe Thunderstorm/Wind Events
	Action or Project
Action/Project Number:	(leave blank)
Name of Action or Project:	Tornado siren system
Action or Project Description:	Installation of siren system that will alert residents of an impending torna
Applicable Goal Statement:	Objective 1:1: Protect our citizen's lives and property
Estimated Cost:	\$20,000
Benefits:	Protect lives
	Plan for Implementation
Responsible Organization/Department:	Cosby City Council
Action/Project Priority:	high
Timeline for Completion:	6 months
Potential Fund Sources:	Grants, Internal, State, Federal, Match
Local Planning Mechanisms to	
be Used in Implementation, if	·
any:	
	Progress Report
Action Status	New
Report of Progress	(leave blank)

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Name of Jurisdiction:	Rosendale, Mo	
	Action or Project	
Action/Project Number:	(leave blank)	
Name of Action or Project:	Tornado siren system for Rosendale, Mo	
Mitigation Category:	Prevention Objective 1: 1 – Protect citizen's lives and property	
STAI Eval Definitely YES Probably NO =	PLEE Criteria uation Rating = 3 Maybe YES = 2 1 Definitely NO = 0	Score
S: Is it Socially Acceptable		3
T: Is it Technically feasible and potenti	ally successful?	2
A: Does the jurisdiction have the Admi	nistrative capacity to execute this action?	2
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutra Environment?	I or positive impact on the natural	0
Will historic structures be saved or protected?		2
Could it be implemented quickly?		3
	STAPLEE SCORE	21
Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives will be saved.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	8
· · · ·	MITIGATION EFFECTIVENESS SCORE	16
	TOTAL SCORE (STAPLEE +	37

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High Priority (30+ points)	Medium Priority (25 - 29 points)
Completed by	Hayley Howard, Community Planner, 816-233-
(Name, Title, Phone Number)	3144

Construction of the second second	Action Worksheet
Nome of Luciedistics	Popendolo Mo
Name of Jurisciction:	Rosendate, Mo
	Risk / Vulnerability
Problem being Mitigated:	Nonexistent warning system for residents of an impending tornado
Hazard(s) Addressed:	Tornado, Severe Thunderstorm/Wind Events
	Action or Project
Action/Project Number:	(leave blank)
Name of Action or Project:	Tornado siren system
	Installation of siren system that will alert residents of an impending tornado
Action or Project Description:	
Applicable Goal Statement:	Objective 1:1: Protect our citizen's lives and property
Estimated Cost:	\$20,000
Benefits:	Protect lives
	Plan for Implementation
Responsible	Rosendale City Council
Organization/Department:	
Action/Project Priority:	high
Timeline for Completion:	6 months
Potential Fund Sources:	Grants, Internal, State, Federal, Match
Local Planning Mechanisms to	· · · · · · · · · · · · · · · · · · ·
be Used in Implementation, if	·-
any:	
	Progress Report
Action Status	New
Report of Progress	(leave blank)

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·····································	STAPLEE WORKSNEET	
Name of Jurisdiction:	Helena, Mo	
	Action or Project	
Action/Project Number:	(leave blank)	
Name of Action or Project:	Tornado siren system for Helena, Mo	
Mitigation Category:	Prevention Objective 1: 1 – Protect citizen's lives and property	
STA Eva Definitely YES Probably NO =	PLEE Criteria luation Rating = 3 Maybe YES = 2 = 1 Definitely NO = 0	Score
S: Is it Socially Acceptable		3
T: Is it Technically feasible and potent	ially successful?	2
A: Does the jurisdiction have the Adm	inistrative capacity to execute this action?	2
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3 .
E: Is it Economically beneficial?		3
E: Will the project have either a neutr Environment?	al or positive impact on the natural	0
Will historic structures be saved or protected?		2
Could it be implemented quickly?		3
	STAPLEE SCORE	21
Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives will be saved.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	8
··· · · · · · · · · · · · · · · · ·	MITIGATION EFFECTIVENESS SCORE	16
	TOTAL SCORE (STAPLEE +	37

High Priority (30+ points)	Medium Priority Low Priority (25 - 29 points) (<25 points)
Completed by	Hayley Howard, Community Planner, 816-233-
(Name, Title, Phone Number)	3144

	Action Worksheet
$\mathbf{L} = \{\mathbf{r}_i, \mathbf{r}_i, \mathbf{r}$	n Maran and Anna an Anna ann an Anna a Anna anna a
Name of Jurisdiction:	Helena, Mo
	Risk / Vulnerability
Problem being Mitigated:	Nonexistent warning system for residents of an impending tornado
Hazard(s) Addressed:	Tornado, Severe Thunderstorm/Wind Events
	Action or Project
Action/Project Number:	(leave blank)
Name of Action or Project:	Tornado siren system
	Installation of siren system that will alert residents of an impending tornado
Action or Project Description:	
	Oblighting 1.1. Destant and skiller of a line and annual st
Applicable Goal Statement:	Objective 1:1: Protect our citizen's lives and property
Estimated Cost:	Destast Rung
Denents:	
	rian for implementation
Responsible Organization/Dopartmont	Helena City Council
Action/Project Priority	high
Timeline for Completion	6 months
Potential Fund Sources:	Grants Internal State Federal Match
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Local Planning Mechanisms to	
be Used in Implementation, if	
any:	
	Progress Report
Action Status	New
Report of Progress	(leave blank)

STAPLEE Worksheet			
Name of Jurisdiction:	Rosendale		
	Action or Project		
Action/Project Number:	1.1.23		
Name of Action or Project:	Rosendale Flood Mitigation and Road Repair		
Mitigation Category:	Prevention Objective 1: 1 – Protect citizen's lives and prope	rty	
STA	PLEE Criteria		
Evaluation RatingDefinitely YES = 3Maybe YES = 2Probably NO = 1Definitely NO = 0		Score	
S: Is it Socially Acceptable		3	
T: Is it Technically feasible and potentially successful?		2	
A: Does the jurisdiction have the Administrative capacity to execute this action?		2	
P: Is it Politically acceptable?		3	
L: Is there Legal authority to implement?		3	
E: Is it Economically beneficial?		3	
E: Will the project have either a neutral or positive impact on the natural Environment ?		3	
Will historic structures be saved or protected?		2	
Could it be implemented quickly?		3	
STAPLEE SCORE		25	
Mitigation Effectiveness Criteria	Evaluation Rating	Score	
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives will be saved.	6	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	8	
MITIGATION EFFECTIVENESS SCORE		14	
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	39	

High Priority (30+ points)	Medium Priority (25 - 29 points)	Low Priority (<25 points)
Completed by	Hayley Howard, Community Planner, 816-233-	
(Name, Title, Phone Number)	3144	

Action Worksheet	
Name of Jurisdiction:	Rosendale, Mo
	Disly / Vashe and biliter
	Kisk / vuinerability
Problem being Mittigated:	Roads and curverts not designed to withstand water volumes
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	1.1.23
Name of Action or Project:	Rosendale Flood Mitigation
Action or Project Description:	Hydrological study, installation of new approximately 20 culverts, raise roads and deepen ditches
Applicable Goal Statement:	Objective 1:1: Protect our citizen's lives and property
Estimated Cost:	\$400,000
Benefits:	Protect property and potentially lives during flood events
	Plan for Implementation
Responsible	City Council
Organization/Department:	
Action/Project Priority:	High
Timeline for Completion:	1 year
Potential Fund Sources:	Grants, Internal, State, Federal, Match
Local Planning Mechanisms to	
be Used in Implementation, if	
anv:	
Progress Report	
Action Status	New
Report of Progress	