# 2019 VERNON COUNTY NATURAL HAZARD MITIGATION PLAN



Prepared by: Kaysinger Basin Regional Planning Commission



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# Vernon County Hazard Mitigation Planning Committee

## Jurisdictional Representatives

Name	Title	Department	Jurisdiction/Agency/ Organization
Karl Zoglmann	Fire Chief	Bronaugh Fire Department	City of Bronaugh
Harry Pitts	Alderman	City Council	City of Bronaugh
Blake Hertzberg	Councilman	City Council	City of Nevada
Brian Leonard	Mayor	City Council	City of Nevada
Carol Clyde Gallagher	Councilman	City Council	City of Nevada
Jayne Novak	Councilman	City Council	City of Nevada
Ryan Watts	Councilman	City Council	City of Nevada
Ann Loudermilk	City Treasurer	City Office	City of Bronaugh
Gary Loudermilk	Water/Wastewater Operator	City Office	City of Bronaugh
JD Kehrman	City Manager	City Office	City of Nevada
Johnna Williams	Deputy City Clerk	City Office	City of Nevada
Kevin Crump	Parks & Rec Director	City Office	City of Nevada
Kristie Modlin	Treasurer	City Office	City of Nevada
Mark Mitchell	Chief Information Officer	City Office	City of Nevada
Randy Marti	Admin Services Director	City Office	City of Nevada
Tera Mcfarland	Community Center Director	City Office	City of Nevada
Tom Hutchison	Operation Manager	City Office	City of Nevada
William McCaffree	City Attorney	City Office	City of Nevada
Erica Drake	Chief Deputy Clerk	County Office	Vernon County
Erik Sommer	Billing Clerk	County Office	Vernon County
Jennifer Roberts	Commission Secretary	County Office	Vernon County
Lindsey Cooksey	Election Clerk	County Office	Vernon County
Pat Renwick	Payroll Clerk	County Office	Vernon County
Russell Milbauer	Compton Junction Fire Dept.	Emergency	Compton Junction
Dennis Kimrey	OEM Director	Emergency	Vernon County
Casey Crain	Police Chief	Police Department	Nevada Police Department
Shayne Simmons	Chief Deputy	Sheriff's Department	Vernon County
Tori Schulze	Assistant Administrator	Vernon County Health Dept.	Vernon County
Rachel James	Alderman	City Council	City of Bronaugh
Sherry Brown	Mayor	City Council	City of Bronaugh
Terry Fleaner	Alderman	City Council	City of Bronaugh
Gene Leininger	City Alderman	City Council	City of Sheldon
Josh Bean	City Alderman	City Council	City of Sheldon
Lois LeVaugh	City Alderman	City Council	City of Sheldon

Perry F. Fowler	City Alderman	City Council	City of Sheldon
Broc Koshko	Alderman	City Council	Schell City
Christy Goodman	South Alderman	City Council	Schell City
Eldon Craig	Alderman	City Council	Schell City
Vickie McKinney	North Alderman	City Council	Schell City
David Prickett	Board Member	City Council	Village of Deerfield
Kaleb Triplett	Board Member	City Council	Village of Deerfield
Kris Sesseck	Board Member	City Council	Village of Deerfield
Mathew Forgey	Board Member	City Council	Village of Deerfield
Terry Forgey	Board Member	City Council	Village of Deerfield
Derek Brown	Water Operator	City Office	City of Bronaugh
Lori Conner	City Clerk	City Office	City of Bronaugh
Mark Godsey	Crew Supervisor	City Office	City of Nevada
Sharon Kegler	Human Resources Director	City Office	City of Nevada
Tim Williams	Crew Supervisor	City Office	City of Nevada
Casey Fogle	Mayor	City Office	City of Richards
James D. Ellis	Board Member	City Office	City of Richards
Joe Winter	Board Member	City Office	City of Richards
Michael Fogle	Board Member	City Office	City of Richards
Richard Delk	Board Member	City Office	City of Richards
Tiffany Ellis	City Clerk	City Office	City of Richards
Becky Morgan	City Clerk	City Office	City of Sheldon
Joe Brzuchauski	City Maintenance Supervisor	City Office	City of Sheldon
Robert Sewell	City Mayor, EMD, Police Chief	City Office	City of Sheldon
David J. McCubbin	Mayor	City Office	Schell City
Erin Lee	City Clerk	City Office	Schell City
Tasha Triplett	City Clerk	City Office	Village of Deerfield
Jesse Luther	City Clerk	City Office	Village of Metz
Tom Nowalk	Fire Chief	Emergency	Compton Junction
Cindy Thompson	Northern Commissioner	County Commission	Vernon County
Everette Wolfe	Southern Commissioner	County Commission	Vernon County
Joe Hardin	Presiding Commissioner	County Commission	Vernon County
Mike Buehler	County Clerk	County Commission	Vernon County
Lynn Seaver	Bridge Foreman	County Office	Vernon County
Bill Thornton	Emergency Management Director	Emergency	City of Nevada
Chris Haynes	Emergency Management Director	Emergency	Vernon County
Kyleigh Newell	Secretary	Nevada School District	Nevada R-V
Donna Davidson	High School Secretary	Northeast Vernon County School District	Northeast Vernon County R-1
Billy Jeffries	Fire Chief	Sheldon Fire Department	City of Sheldon

Vickie Jadlot	High School Secretary	Sheldon School District	Sheldon R-VIII
Gary Badger	Board Member	Township	Clear Creek Township
John D. Leonard	Trustee	Township	Clear Creek Township
Glenda Wolf	Township Clerk	Township	Coal Township
JT Kitsmiller	Board Member	Township	Coal Township
Ron Wolf	Trustee	Township	Coal Township
Jeani Longstreth	Township Clerk	Township	Deerfield Township
Barbara Clark	Township Clerk	Township	Dover Township
Jim Clark	Trustee	Township	Dover Township
David Shaw	Trustee	Township	Drywood Township
Charlotte Cox	Township Clerk	Township	Harrison Township
Jim Foulk	Trustee	Township	Harrison Township
Nicholas Crownover	Motor Grader Operator	Township	Harrison Township
Russell L. Rourk	Trustee	Township	Harrison Township
Taylor Rourk	President	Township	Harrison Township
David E. Barnes	President	Township	Henry Township
Larry K. Clark	Trustee	Township	Henry Township
Bo Phillips	Board Member	Township	Lake Richland Township
Elaine Harth	Township Clerk	Township	Lake Richland Township
Wayne Harth	Trustee	Township	Lake Richland Township
Jeff Parish	Board Member	Township	Montevallo Township
Joe Charles	Board Member	Township	Metz Township
Tim Mark	Trustee	Township	Montevallo Township
Doug Bowling	Trustee	Township	Moundville Township
Jerry Reedy	Board Member	Township	Moundville Township
Joshua Shaw	Board Member	Township	Moundville Township
Lisa Bowling	Township Clerk	Township	Moundville Township
Scotty Pritchett	President	Township	Osage Township
Harry Boyle	Board Member	Township	Vigil Township
James Jenkins	Board Member	Township	Vigil Township
James L. Boyle	Trustee	Township	Vigil Township
Donald Cubbage	Trustee	Township	Walker Township
Ken Jones	Trustee	Township	Washington Township
Paula Messner	IT/GIS	Vernon County GIS	Vernon County
Melissa Keating	Registered Nurse	Vernon County Health Dept.	Vernon County
Jim Davis	General Manager	Sac Osage Electric Coop.	Sac Osage Electric Coop.
Dr. Jim Horton	Superintendent	Bronaugh School District	Bronaugh R-VII School District
Marvin Shelton	Village Clerk	City Office	Village of Stotesbury

### Stakeholder Representatives

Ashley Bradbury	3M, Emergency Health Services Assistant	ЗМ	3M-Nevada
Jack Pietruszewski	3M, EHS Engineer	ЗМ	3M-Nevada
Jennifer Whiteside	3M, Emergency Health Services Supervisor	ЗМ	3M-Nevada
Nick Matysek	3M, EHS Engineer/PHM Coordinator	ЗМ	3M-Nevada
Sara Rains	Environmental Specialist	3M	3M-Nevada
Terry Charles	3M, Emergency Health Services	3M	3M-Nevada
Derik White	3M, Milo Fire Department	3M, Milo Fire, EHS	3M-Nevada, Village of Milo
Becky Bogle	3M, EHS	3M	3M-Nevada
Marty Tourtillolt	Emergency Response Tech.	3M	3M-Nevada
Chad Mays	Construction Coordinator	Liberty Utilities	Empire Gas District
Sara Nunez	Director of Programs	On My Own, Inc.	On My Own, Inc.
Mike Burger	Director Safety	Cottey College	Vernon County
Eric McPeak	Local Manager	Alliance Water Resources	Vernon County
Mark Burger	Director of Safety	Cottey College	Vernon County
Russ Warren	Reporter	KNEM/KNMO	Vernon County
Nick Wright	Editor	Nevada Daily Mail	Vernon County
Carol Branhan	Director	Nevada Housing Authority	City of Nevada
Jennifer Gundy	Executive Director	On My Own, Inc.	Vernon County
Julie Stolting	Disaster Program Specialist	Red Cross	Vernon County
Tom Born	Safety Manager	Southwest Community Services	Vernon County
Dan Barnett	Maintenance Supervisor	Nevada Housing Authority	City of Nevada
Renee Eck	Clinical Director	Nevada Medical Clinic	Vernon County
Mike Catron	Administrator	Nevada Nursing & Rehab	Vernon County
Doug Hundley	Director of Integrated Services	Nevada Regional Medical Center	Vernon County
Kelly Ast	Community Coordinator	Healthy Nevada	Vernon County
Mike Ast	Safety Officer	Heartland Behavioral Health Services	Vernon County
Alan Hooper	Maintenance Supervisor	MoDOT	Vernon County
Roger Mann	MoDOT Inspector	MoDOT	Vernon County
Gabe Franklin	Journalist	Nevada Daily Mail	Vernon County
Johannes Brann	Reporter	Nevada Daily Mail	Vernon County
Jessica Dutton	Business Development	CDL Electric	Vernon County
Mike McLeod	Representative	CDL Electric	Vernon County
Sheree Gayman	Executive Director	Chamber of Commerce	Vernon County

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The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Vernon County, Bronaugh, Deerfield, Metz, Nevada, Richards, Sac Osage Electric Cooperative, Schell City, Sheldon, Stotesbury, Walker, Bronaugh R-VII School District, Nevada R-V School District, and Sheldon R-VIII School District have developed this multijurisdictional local hazard mitigation plan update to reduce future losses from hazard events to the County and its communities and school/special districts. The plan is an update of a plan that was approved on November 1, 2013. The plan and the update were prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to result in eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant Programs.

The Vernon County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following nine jurisdictions that participated in the 2013 planning process:

- Vernon County (Unincorporated)
- City of Bronaugh
- Village of Deerfield
- City of Nevada
- City of Richards
- City of Schell City
- City of Sheldon
- Nevada R-V School District
- Bronaugh R-VII School District

The Sheldon R-VIII School District, Sac Osage Electric Cooperative, Village of Stotesbury, the City of Walker and the Village of Metz did not participate in the 2013 plan, but are participating in this update.

The following jurisdictions participated in the 2013 plan update, but <u>did not</u> participate in the development of this plan update.

- Village of Harwood
- Village of Moundville
- Village of Milo
- Northeast Vernon County R-1 School District

Vernon County and the entities listed above developed a Multi-Jurisdictional Hazard Mitigation Plan that was approved by FEMA on November 1, 2013 (hereafter referred to as the *2013 Hazard Mitigation Plan*). This current planning effort serves to update that previously approved plan.

The plan update process followed a methodology prescribed by FEMA, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Vernon County and participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Vernon County and analyzed jurisdictional vulnerability

to these hazards. The MPC also examined the capabilities in place to mitigate the hazard damages, with emphasis on changes that have occurred since the previously approved plan was adopted. The MPC determined that the planning area is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Riverine and flash flooding, winter storms, severe thunderstorms/hail/lightning/high winds, and tornadoes are among the hazards that historically have had a significant impact.

Based upon the risk assessment, the MPC updated goals for reducing risk from hazards. The goals are listed below:

- 1. Protect the lives and livelihoods of all citizens.
- 2. Mitigate the effects of future natural hazards in the county.
- 3. Strengthen communication and awareness to coordinate participation between public agencies, citizens, non-profit organizations, business and industry.
- 4. Develop written policies and procedures for preparedness and mitigation response to natural disasters.

To advance the identified goals, the MPC developed recommended mitigation actions, which are detailed in Chapter 4 of this plan. The MPC developed an implementation plan for each action, which identifies the priority level, background information, ideas for implementation, responsible agency, timeline, cost estimate, potential funding sources, and more.

44 CFR requirement 201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This plan has been reviewed by and adopted with resolutions or other documentation of adoption by all participating jurisdictions and school districts. The documentation of each adoption is included in Appendix C, and a model resolution is included on the following page.

The following jurisdictions participated in the development of this plan and have adopted the multi-jurisdictional plan.

- Vernon County (unincorporated)
- City of Bronaugh
- Village of Deerfield
- Village of Metz
- City of Nevada
- City of Richards
- Sac Osage Electric Cooperative
- City of Schell City
- City of Sheldon
- Village of Stotesbury
- City of Walker
- Bronaugh R-VII School District
- Nevada R-V School District
- Sheldon R-VIII School District

The following jurisdictions participated in the 2013 plan update, but <u>did not</u> participate in the development of this plan update.

- Village of Harwood
- Village of Moundville
- Village of Milo
- Northeast Vernon County R-I School District

#### **Model Resolution**

(LOCAL GOVERNING BODY/SCHOOL DISTRICT), Missouri RESOLUTION NO.

A RESOLUTION OF THE (LOCAL GOVERNING BODY /SCHOOL DISTRICT) ADOPTING THE (PLAN NAME)

WHEREAS the (*local governing body/school district*) recognizes the threat that natural hazards pose to people and property within the (local governing body/school district); and

WHEREAS the (*local governing body/school district*) has participated in the preparation of a multijurisdictional local hazard mitigation plan, hereby known as the (*plan name*), 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 *(local governing body/school district)* from the impacts of future hazards and disasters; and

WHEREAS the (*local governing body*) recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the (*local governing body/school district*) will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the (*local governing body/school district*) demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE (*LOCAL GOVERNMENT/SCHOOL DISTRICT*), in the State of Missouri, THAT:

In accordance with (*local rule for adopting resolutions*), the (*local governing body/school district*) adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of	in favor and	against, and	abstaining, this_day of
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\_\_\_\_\_,\_\_\_\_.

By (Sig): _ Print name:			
ATTEST: By (Sig.):			
Print name:			
APPROVED A	AS TO FORM:		
By (Sig.):			
Print name:			

# **1 INTRODUCTION AND PLANNING PROCESS**

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# 1.1 PURPOSE

Hazard Mitigation is the process of preparing for and taking action in order to reduce the longterm risk of natural disasters to financial and human consequences. Mitigation actions may be implemented prior to, during, or after a hazard event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs (<u>http://www.fema.gov/what-mitigation</u>).

The Vernon County Hazard Mitigation Plan is designed as a resource for the County and municipal governments, residents, developers, organizations and others interested in controlling the potentially disastrous effects of natural hazards in Vernon County. Jurisdictions are encouraged to be a part of the planning process. The planning process is as important as the plan itself and creates a framework, both locally and regionally, for the development and implementation of public policy designed to protect citizens, critical infrastructure, public and private property, and the environment from the impact of hazards. By participating in the planning process and meeting the necessary requirements to be a participating jurisdiction, communities, school districts and other special districts become eligible to apply for mitigation grant funding. This updated plan ensures the continuity of mitigation project grant funding through 2023.

# **1.2 BACKGROUND AND SCOPE**

Under the initiative set forth by SEMA, the Missouri Association of Councils of Government (MACOG) agreed to meet the challenge of developing county and municipal plans throughout the state. The 19 Regional Planning Commissions of MACOG provide an effective way 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 being an organized approach to address a broad cross section of area-wide issues. They are also 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. SEMA's initiative further states that, due to time and funding limitations, the plans developed by Missouri's Regional Planning Commissions should cover natural hazards only. Man-made and/or technological hazards are not addressed in this plan, except in the

context of cascading damages.

As required by 44 CFR §201.6(d)(3), a local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts and changes in priorities, and resubmit it for approval every five (5) years in order to continue to be eligible for mitigation project grant funding. The 2018 Vernon County Multi-Jurisdictional Natural Hazard Mitigation Plan, from here on referred to as the Vernon County Hazard Mitigation Plan, is a revision of the previous five-year plan approved by FEMA on November 14, 2013, which was the first five-year update of the original plan completed in 2005.

Through SEMA's Scope of Work, Vernon County contracted with Kaysinger Basin Regional Planning Commission and participated fully in the preparation of the plan. Once this plan is approved, Vernon County and jurisdictions within the county will be eligible for future mitigation assistance from FEMA and will be able to more effectively carry out mitigation activities to lessen the adverse impact of future disasters within the county.

The Vernon County Hazard Mitigation Plan was prepared by Kaysinger Basin Regional Planning Commission (KBRPC). KBRPC, a member of MACOG, was created October 14, 1968 by Governor Warren E Hearnes. The Commission serves a seven county region consisting of Bates, Benton, Cedar, Henry, Vernon, St. Clair and Vernon Counties.

The Vernon County Hazard Mitigation Plan is a major rewrite of the 2013 plan and reflects changes in priorities and development, and the continued commitment of local governments to mitigate the impact of natural hazards in Vernon County. Local Jurisdictions that participated in the 2013 plan and are continuing participation in the 2018 plan include:

- Vernon County
- City of Bronaugh
- Village of Deerfield
- City of Nevada
- City of Richards
- City of Schell City
- City of Sheldon
- Bronaugh R-VII School District
- Nevada R-V School District

Local Jurisdictions that did not participate in the 2013, but are participating in the 2018 plan update include:

- Village of Metz
- Village of Stotesbury
- City of Walker
- Sheldon R-VIII School District
- Sac Osage Electric Cooperative

Jurisdictions that do not adopt the plan will not be eligible to apply for FEMA Hazard Mitigation Assistance funds in the event of a disaster. Participation in the hazard mitigation plan is required as stated in The Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act or DMA). The regulations established the requirements for local hazard mitigation plans are in the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). With an approved updated hazard mitigation plan, participating jurisdictions will be eligible for grants under the following federal hazard mitigation assistance programs:

- Hazard Mitigation Grant Program (HMGP);
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)

All jurisdictions received letter and email communications notifying the representatives of all upcoming meetings and participation requirements. The Vernon County Hazard Mitigation Plan is the representation of the Jurisdictions' commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Information in the Plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future.

# **1.3 PLAN ORGANIZATION**

The Vernon County Hazard Mitigation Plan is organized into five chapters. The 2013 Plan classified the Chapters as Sections and the plan also included Section 6 that was dedicated to Maps. This has been changed to Chapters and the information from Section 6 has been incorporated into the 2019 Plan throughout its entirety. The format of this plan was changed to conform to the local hazard mitigation plan outline template that was released by the Missouri State Emergency Management Agency (SEMA) in September 2016. This plan contains a mitigation action listing, a discussion of the purpose and methodology used to develop the plan, a profile on Vernon County, as well as the hazard identification and vulnerability assessment of natural hazards. In addition, the plan offers a discussion of the community's current capability to implement the goals, objectives and strategies identified through the planning process.

The Plan is organized as follows:

- Chapter 1: Introduction and Planning Process
- Chapter 2: Planning Area Profile and Capabilities
- Chapter 3: Risk Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Implementation and Maintenance
- Appendices

To assist in the explanation of the above identified contents, there are several appendices included which provide more detail on the specific subject. This plan is intended to improve the ability of Vernon County and the jurisdictions within to handle disasters and will document valuable local knowledge on the most efficient and effective ways to reduce loss.

Table 1.1.	Summary	v of Changes	Made in	Plan Update

Plan Chapter	Summary of Changes Made
Introduction	Reformatted to follow updated model outline.
	Reworded, rearranged and included more detailed
	information per section.
Section 1-Introduction and Planning	Changed to Chapter 1. Reformatted to follow updated
Process	model outline. Reworded, rearranged and included
	more detailed information per section
Section 2-Planning Area Profile and	Changed to Chapter 2. Reformatted to follow updated
Capabilities	model outline.
Section 3-Risk Assessment	Changed to Chapter 3. Reformatted to follow updated
	model outline.
Section 4-Mitigation Strategies	Changed to Chapter 4. Reformatted to follow updated
	model outline.
Section 5-Plan Maintenance Process	Changed to Chapter 5. Reformatted to follow updated
	model outline.
Section 6-Maps	This section was removed and the Maps were
	implemented into the plan throughout its entirety.

# **1.4 PLANNING PROCESS**

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

Kaysinger Basin Regional Planning Commission (KBRPC) was contracted to facilitate the plan development process. KBRPC is a council of local governments in west central Missouri serving Bates, Benton, Cedar, Henry, Hickory, St. Clair, and Vernon counties. The initial plan was adopted by participating jurisdictions in the spring of 2005, and an update was completed and approved in 2013.

KBRPC's role in developing and updating the Vernon County Hazard Mitigation plan included assisting in the formation of the MPC and facilitating the planning meetings, soliciting public input and producing the draft and final plan for review by the MPC, SEMA, and FEMA. KBRPC staff carried out the research and documentation necessary for the planning process. In addition, KBRPC compiled and presented the data for the plan, helped the MPC with the prioritization process and insured that the final document met the DMA requirements established by federal regulations and the most current planning guidance.

In recent years, SEMA secured a grant to review and update the Vernon County Multi-Hazard Mitigation Plan and contracted with KBRPC to facilitate the planning process for the plan update. KBRPC staff has followed the most current planning guidance provided by FEMA for the purpose of insuring that the updated plan meets all of the requirements of the Disaster Mitigation Act as established by federal regulations.

The Vernon County Multi-Hazard Mitigation Plan was developed as the result of a collaborative effort among Vernon County, the cities/villages of Bronaugh, Deerfield, Nevada, Schell City, Richards, Sheldon, Metz, Stotesbury, Walker, Nevada R-V School District, Bronaugh R-VII School District, Sheldon R-VIII, Sac Osage Cooperative, public agencies, non-profit

organizations, the private sector as well as regional state and federal agencies. KBRPC contacted and asked for volunteers to serve on the planning committee from the county and local city governments, school districts, the county health department, local businesses, and utility companies. The mailing list is included in **Appendix A**: Planning Process. This cross-section of local representatives was chosen for their experience and expertise in emergency planning and community planning in Vernon County. Staff worked with the Vernon County MPC to collect and analyze information on hazards and disasters that have impacted the county as well as document mitigation activities that have occurred during the past five years.

Due to time and duty constraints, not all the jurisdictions that were invited to participate in the MPC were able to attend meetings. However, all of the jurisdictions provided information to update the document, reviewed the plan and provided input. Interviews were conducted with stakeholders from the community and several planning meetings were conducted during the plan review and update.

The 2019 planning process began with a kick-off meeting December 7, 2017. KBRPC staff provided an in-depth overview of the hazard mitigation planning purpose, including requirements and grant programs. The process included two additional MPC meetings and one on one meeting with each jurisdiction. KBRPC was responsible for producing the draft and final plan update in a FEMA approvable document, and coordinating with SEMA and FEMA plan reviews.

Specific information about the agenda items discussed during the MPC meetings are presented in Section 1.4.2. regarding the planning steps. KBRPC also assisted in soliciting public involvement in the planning process, partially by providing information about the plan through informational handouts and by presenting at public meetings to all jurisdictions interested. Notifications of the MPC meetings were sent via public notice to the Nevada Daily Mail newspaper, all jurisdictions within Vernon County and presented and discussed at City Council Meetings and Board of Education Meetings during the planning process. Along with the public notice, all jurisdictions were sent a copy of the agenda for each meeting to be posted for public viewing prior to the MPC meetings. The public notice and agenda were posted to the door of Kaysinger Basin Regional Planning Commission's office door for public viewing. Drafts of the Vernon County Hazard Mitigation Plan were posted on the KBRPC website for public comment during the drafting of the plan and prior to the plan being submitted for approval. **Appendix A** provides documentation of the planning process including public involvement solicitations and meeting notices along with the sign-in sheet for each meeting that took place.

Name	Title	Department	Jurisdiction/Agency/ Organization
Karl Zoglmann	Fire Chief	Bronaugh Fire Department	City of Bronaugh
Harry Pitts	Alderman	City Council	City of Bronaugh
Blake Hertzberg	Councilman	City Council	City of Nevada
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Josh Bean	City Alderman	City Council	City of Sheldon
Lois LeVaugh	City Alderman	City Council	City of Sheldon
Perry F. Fowler	City Alderman	City Council	City of Sheldon

Table 1.2.	Jurisdictional Representatives	Vernon County Mit	tigation Planning	a Committee

Broc Koshko	Alderman	City Council	Schell City
Christy Goodman	South Alderman	City Council	Schell City
Eldon Craig	Alderman	City Council	Schell City
Vickie McKinney	North Alderman	City Council	Schell City
David Prickett	Board Member	City Council	Village of Deerfield
Kaleb Triplett	Board Member	City Council	Village of Deerfield
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Mark Godsey	Crew Supervisor	City Office	City of Nevada
Sharon Kegler	Human Resources Director	City Office	City of Nevada
Tim Williams	Crew Supervisor	City Office	City of Nevada
Casey Fogle	Mayor	City Office	City of Richards
James D. Ellis	Board Member	City Office	City of Richards
Joe Winter	Board Member	City Office	City of Richards
Michael Fogle	Board Member	City Office	City of Richards
Richard Delk	Board Member	City Office	City of Richards
Tiffany Ellis	City Clerk	City Office	City of Richards
Becky Morgan	City Clerk	City Office	City of Sheldon
Joe Brzuchauski	City Maintenance Supervisor	City Office	City of Sheldon
Robert Sewell	City Mayor, EMD, Police Chief	City Office	City of Sheldon
David J. McCubbin	Mayor	City Office	Schell City
Erin Lee	City Clerk	City Office	Schell City
Tasha Triplett	City Clerk	City Office	Village of Deerfield
Jesse Luther	City Clerk	City Office	Village of Metz
Tom Nowalk	Fire Chief	Emergency	Compton Junction
Cindy Thompson	Northern Commissioner	County Commission	Vernon County
Everette Wolfe	Southern Commissioner	County Commission	Vernon County
Joe Hardin	Presiding Commissioner	County Commission	Vernon County
Mike Buehler	County Clerk	County Commission	Vernon County
Lynn Seaver	Bridge Foreman	County Office	Vernon County
Bill Thornton	Emergency Management Director	Emergency	City of Nevada
Chris Haynes	Emergency Management Director	Emergency	Vernon County
Kyleigh Newell	Secretary	Nevada School District	Nevada R-V
Donna Davidson	High School Secretary	Northeast Vernon County School District	Northeast Vernon County R-1

Billy Jeffries	Fire Chief	Sheldon Fire Department	City of Sheldon
Vickie Jadlot	High School Secretary	Sheldon School District	Sheldon R-VIII
Gary Badger	Board Member	Township	Clear Creek Township
John D. Leonard	Trustee	Township	Clear Creek Township
Glenda Wolf	Township Clerk	Township	Coal Township
JT Kitsmiller	Board Member	Township	Coal Township
Ron Wolf	Trustee	Township	Coal Township
Jeani Longstreth	Township Clerk	Township	Deerfield Township
Barbara Clark	Township Clerk	Township	Dover Township
Jim Clark	Trustee	Township	Dover Township
David Shaw	Trustee	Township	Drywood Township
Charlotte Cox	Township Clerk	Township	Harrison Township
Jim Foulk	Trustee	Township	Harrison Township
Nicholas Crownover	Motor Grader Operator	Township	Harrison Township
Russell L. Rourk	Trustee	Township	Harrison Township
Taylor Rourk	President	Township	Harrison Township
David E. Barnes	President	Township	Henry Township
Larry K. Clark	Trustee	Township	Henry Township
Bo Phillips	Board Member	Township	Lake Richland Township
Elaine Harth	Township Clerk	Township	Lake Richland Township
Wayne Harth	Trustee	Township	Lake Richland Township
Jeff Parish	Board Member	Township	Montevallo Township
Joe Charles	Board Member	Township	Metz Township
Tim Mark	Trustee	Township	Montevallo Township
Doug Bowling	Trustee	Township	Moundville Township
Jerry Reedy	Board Member	Township	Moundville Township
Joshua Shaw	Board Member	Township	Moundville Township
Lisa Bowling	Township Clerk	Township	Moundville Township
Scotty Pritchett	President	Township	Osage Township
Harry Boyle	Board Member	Township	Vigil Township
James Jenkins	Board Member	Township	Vigil Township
James L. Boyle	Trustee	Township	Vigil Township
Donald Cubbage	Trustee	Township	Walker Township
Ken Jones	Trustee	Township	Washington Township
Paula Messner	IT/GIS	Vernon County GIS	Vernon County
Melissa Keating	Registered Nurse	Vernon County Health Dept.	Vernon County
Jim Davis	General Manager	Sac Osage Electric Coop.	Sac Osage Electric Coop. Bronaugh R-VII School
Dr. Jim Horton	Superintendent	Bronaugh School District	District
Marvin Shelton	Village Clerk	City Office	Village of Stotesbury

Ashley Bradbury	3M, Emergency Health Services Assistant	ЗМ	3M-Nevada
Jack Pietruszewski	3M, EHS Engineer	ЗМ	3M-Nevada
Jennifer Whiteside	3M, Emergency Health Services Supervisor	3M	3M-Nevada
Nick Matysek	3M, EHS Engineer/PHM Coordinator	ЗМ	3M-Nevada
Sara Rains	Environmental Specialist	3M	3M-Nevada
Terry Charles	3M, Emergency Health Services	3M	3M-Nevada
Derik White	3M, Milo Fire Department	3M, Milo Fire, EHS	3M-Nevada, Village of Milo
Becky Bogle	3M, EHS	3M	3M-Nevada
Marty Tourtillolt	Emergency Response Tech.	3M	3M-Nevada
Chad Mays	Construction Coordinator	Liberty Utilities	Empire Gas District
Sara Nunez	Director of Programs	On My Own, Inc.	On My Own, Inc.
Mike Burger	Director Safety	Cottey College	Vernon County
Eric McPeak	Local Manager	Alliance Water Resources	Vernon County
Mark Burger	Director of Safety	Cottey College	Vernon County
Russ Warren	Reporter	KNEM/KNMO	Vernon County
Nick Wright	Editor	Nevada Daily Mail	Vernon County
Carol Branhan	Director	Nevada Housing Authority	City of Nevada
Jennifer Gundy	Executive Director	On My Own, Inc.	Vernon County
Julie Stolting	Disaster Program Specialist	Red Cross	Vernon County
Tom Born	Safety Manager	Southwest Community Services	Vernon County
Dan Barnett	Maintenance Supervisor	Nevada Housing Authority	City of Nevada
Renee Eck	Clinical Director	Nevada Medical Clinic	Vernon County
Mike Catron	Administrator	Nevada Nursing & Rehab	Vernon County
Doug Hundley	Director of Integrated Services	Nevada Regional Medical Center	Vernon County
Kelly Ast	Community Coordinator	Healthy Nevada	Vernon County
Mike Ast	Safety Officer	Heartland Behavioral Health Services	Vernon County
Alan Hooper	Maintenance Supervisor	MoDOT	Vernon County
Roger Mann	MoDOT Inspector	MoDOT	Vernon County
Gabe Franklin	Journalist	Nevada Daily Mail	Vernon County
Johannes Brann	Reporter	Nevada Daily Mail	Vernon County
Jessica Dutton	Business Development	CDL Electric	Vernon County
Mike McLeod	Representative	CDL Electric	Vernon County
Sheree Gayman	Executive Director	Chamber of Commerce	Vernon County

# Table 1.3. Stakeholder Representatives

## **1.4.1** Multi-Jurisdictional Participation

# 44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

The Vernon County Hazard Mitigation Plan serves a written document of the planning process. Active participation of local jurisdiction representatives and stakeholders in the hazard mitigation planning process is essential if the Plan is to have value. To be eligible for mitigation funding, local governments must adopt the FEMA-approved update of the Plan. The participation of local government stakeholders in the planning process is considered critical to successful implementation of this plan, regardless of the degree of modifications. KBRPC collaborated with the local governments in Vernon County to assure participation in the plan process and the development of a plan that represents the needs and interests of Vernon County and its local jurisdictions. **Appendix C** contains resolutions for each jurisdiction adopting the Plan.

The County Commission, incorporated communities, public schools, special districts, and various other stakeholders in mitigation planning were invited to a kick-off meeting for the Plan update on December 7, 2017. At this meeting it was explained that the Disaster Mitigation Act (DMA) requires each jurisdiction participating in the planning process officially adopt the plan. Each jurisdiction was required to meet plan participation requirements as defined by KBRPC at the beginning of the planning process. Minimum participation requirements are as followed:

- 1. Provide information to support plan update through at least one of the following methods:
  - a) Completion of worksheets;
  - b) Attendance at public meetings;
  - c) Executed letters of authorization
  - d) Alternately scheduled meetings with KBRPC staff for data collection; or
  - e) Communicate with KBRPC staff through email concerning data collection.
- 2. Formal adoption of the mitigation plan update.

All of the participating jurisdictions in Vernon County listed as participants in the plan update met the minimum participation requirements as indicated in the table below. Documentation in the form of people contacted and sign-in sheets for attendance at group meetings is included in the **Appendix A**.

In addition to public outreach solicited through the KBRPC prepared public survey, each participating jurisdiction was strongly encouraged to seek public input at an open public meeting or through various forms of input solicitation.

**Table 1.3** shows the representation of each participating jurisdiction at the planning meetings, the provision of responses to the Data Collection Questionnaire, the active critical facility validation, the update/development of mitigation actions, and the documentation of donated time. All jurisdictions participating in the Plan either reviewed or commented on the draft Plan, participated in the update/development of mitigation actions, documented the donation of time, and passed an adopting resolution. Reference sign-in sheets and other documentation located in **Appendix A**.

Jurisdiction	Kick-off Meeting	Meeting #2	Meeting #3	Data Collection Questionnaire Response	Formal Plan Adoption	Meeting with KBRPC	Documented Donated Time
Vernon County	Х	Х	Х	Х	Х	Х	Х
City of Bronaugh				Х	Х	Х	
Village of Deerfield			Х	Х	Х	Х	Х
Village of Metz			Х	Х	Х	Х	Х
City of Nevada	Х	Х		Х	Х	Х	Х
City of Richards				Х	Х	Х	Х
City of Schell City				Х	Х	Х	Х
City of Sheldon		Х		Х	Х	Х	Х
Village of Stotesbury				Х	Х	Х	Х
City of Walker			Х	Х	Х	Х	Х
Nevada R-1V School				Х	Х	Х	Х
Bronaugh R-VII School				X	X		X
Sheldon R-III School				Х	Х	Х	Х
Sac Osage Electric Cooperative		Х		X	Х	Х	Х

 Table 1.4.
 Jurisdictional Participation in Planning Process

## 1.4.2 The Planning Steps

FEMA's Local Mitigation Planning Handbook (March 1, 2013), Local Mitigation Plan Review Guide (October 1, 2011), and Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials (March 1, 2013) were used as the sources for developing the Vernon County Hazard Mitigation Plan update process. The development of this plan followed the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. The 10-step process allows the Vernon County Hazard Mitigation Plan to meet funding requirements of the Hazard Mitigation Grant Program, Pre- Disaster Mitigation Program, Community Rating System, and Flood Mitigation Assistance Program.

Table 1.4 shows how the CRS process aligns with the Nine Task Process outlined in the 2013 Local Mitigation Planning Handbook. Following Table 1.4 is a summary of how KBRPC staff used the Nine Task Process to develop the update for the Vernon County Hazard Mitigation Plan.

Table 1.5.	<b>County Mitigation Plan Update Process</b>
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Community Rating System (CRS) Planning Steps (Activity 510)	Local Mitigation Planning Handbook Tasks (44 CFR Part 201)	
Step 1. Organize	Task 1: Determine the Planning Area and Resources	
	Task 2: Build the Planning Team 44 CFR 201.6(c)(1)	
Step 2. Involve the public	Task 3: Create an Outreach Strategy 44 CFR 201.6(b)(1)	

Step 3. Coordinate	Task 4: Review Community Capabilities 44 CFR 201.6(b)(2) & (3)
Step 4. Assess the hazard	Task 5: Conduct a Risk Assessment 44 CFR 201.6(c)(2)(I) 44 CFR 201.6(c)(2)(ii) & (iii)
Step 5. Assess the problem	
Step 6. Set goals	Task 6: Develop a Mitigation Strategy 44 CFR
Step 7. Review possible activities	201.6(c)(3)(i); 44 CFR 201.6(c)(3)(ii); and 44 CFR 201.6(c)(3)(iii)
Step 8. Draft an action plan	
Step 9. Adopt the plan	Task 8: Review and Adopt the Plan
Step 10. Implement, evaluate, revise	Task 7: Keep the Plan Current
	Task 9: Create a Safe and Resilient Community 44 CFR 201.6(c)(4)

## Step 1: Organize the Planning Team (Handbook Tasks 1 & 2)

In April 2017, KBRPC entered into cooperative agreements with SEMA and Vernon County to prepare this Multi-Jurisdiction Hazard Mitigation Plan for public entities in Vernon County. Discussion on the development of the Vernon County Hazard Mitigation Plan began in March of 2017 with the Vernon County Commissioners. During this time, the timeline for developing the hazard mitigation plan and the planning process were discussed. KBRPC staff worked closely with the Commission to identify the stakeholders and community organizations to be included in the planning process.

The Kick-off Meeting was scheduled for December 7, 2017 to initiate participation of jurisdictions and public entities in the planning process. A list of prospective participant representatives and stakeholders were identified and a contact list was prepared for emailing and mailing an invitation letter to the kick-off meeting. The list of invitees included local elected officials, municipal government staff, county government staff, emergency services personnel, public school administrators, members from health and social services organizations, utility providers, and volunteer organizations. A complete list of invitees is listed in **Appendix A**. Along with the list of stakeholders, all representatives of each jurisdiction and the public were notified through a public notice sent to each representative and published in the *Nevada Daily Mail* newspaper.

The MPC met on several occasions from November 2017 through May 2018 through public meetings and one-on-one meetings with KBRPC to collaborate on the development of the Vernon County Hazard Mitigation Plan update. Participants assisted in data collection, reviewed and revised the 2013 plan's goals and mitigation strategies, and reviewed and commented on the plan throughout the planning process. Communication with the MPC was constant throughout the planning process through phone conversations, letters, email correspondences, one-on-one meetings in addition to committee meetings. Table 1.5 shows the meeting schedule and items that were discussed for the MPC meetings.

#### Table 1.6.Schedule of MPC Meetings

Meeting	Торіс	Date
Informational Meeting	Meeting with the Vernon County Commissioners to discuss the	2/15/2017

Plan Maintenance	Previous plan maintenance was discussed during the meeting	4/7/2017
Meeting	with the Commissioners and a Maintenance Agreement was	
	presented. MOU was signed.	
Kick-off Meeting	Hazard Mitigation planning purpose	12/7/2017
The the the the the	Creat programs linked to approved plan	12/1/2011
	Planning tasks - Multi-Jurisdictional Approach,	
	• Future meeting dates were discussed and scheduled along	
	with the next steps in the planning process,	
	<ul> <li>Participation requirements,</li> </ul>	
	Public involvement,	
	Data Collection Questionnaires were given to all in attendance	
	<ul> <li>Discussion of hazards and critical facility inventory</li> </ul>	
		40/40/0047
LEPC Meeting	Hazard Mitigation planning purpose and presentation,	12/13/2017
	<ul> <li>Recap of the Kick-off meeting,</li> </ul>	
	<ul> <li>LEPC's role in the plan update,</li> </ul>	
	Data Collection Questionnaires, work plan, action	
	worksheet, STAPLEE, and survey were given to all in	
	attendance,	
	Local match discussion.	
Planning Meeting #2	Procontation on Hazard Mitigation and a recan of the kick off	1/18/2018
Fianning Meeting #2	<ul> <li>Presentation on Hazaru Miligation and a recap of the kick-on mosting</li> </ul>	1/10/2010
	meeting,	
	• Packets containing a Jurisdiction letter, Statue 201.6, Data	
	Collection Questionnaires, work plan, action worksheet,	
	STAPLEE, and surveys were given to all in attendance,	
	<ul> <li>Local Match was discussed,</li> </ul>	
	<ul> <li>Technical Committee participation was discussed,</li> </ul>	
	Collection of completed Data Collection Questionnaires.	
Planning Meeting #3	<ul> <li>Procontation on the work plan was given and goals were</li> </ul>	3/21/18
Thanning Meeting #5	• Presentation on the work plan was given and goals were	5/21/10
	la dete en areaneze ef alen de sum ent	
	Opdate on progress of plan document,	
	<ul> <li>Packets containing the work plan, action worksheet and</li> </ul>	
	STAPLEE were given to all in attendance,	
	<ul> <li>The work plan was reviewed and updated,</li> </ul>	
	<ul> <li>Future plan monitoring and evaluation was discussed and</li> </ul>	
	maintenance agreement was revisited,	
	Surveys were given to all in attendance,	1
	Document collection for completed Data Questionnaires.	1
	Public Comment Period was discussed.	1
	Resolutions were discussed for each jurisdiction	1
	<ul> <li>KBRPC will meet one-on-one with each jurisdiction as needed.</li> </ul>	1
Planning	Plan update written	3/21/20818
-		to 3/6/2019

## Step 2: Plan for Public Involvement (Handbook Task 3)

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

Options for soliciting public input on the Plan were discussed at the MPC kick-off meeting held on December 7, 2017. KBRPC staff explained the importance of public involvement during the planning process. It was determined that KBRPC staff would advertise the MPC meetings through press releases to the local newspaper, *The Nevada Daily Mail*. In addition, meeting dates and invitations were posted on the KBRPC front door, website, and social media page along with drafts of the Plan for public comment during the drafting stage and prior to submission of the Plan to SEMA for approval. Copies of the affidavits of publication for legal notices, screen captures, and copies of the press releases are included in **Appendix A**. Public input was also sought by KBRPC and members of the MPC through announcements at community gathering, community organizations meetings, County Commission meetings, Board of Education meetings, City Council/Board of Alderman meetings, and local emergency planning committee meetings.

KBRPC staff attended City Council/Board of Aldermen meetings, County Commission Meetings, Local Emergency Planning Committee Meetings, and other public gatherings to solicit public involvement. KBRPC also sent out emails to all jurisdictions and provided the power-point presentations to each school district to send out as a training to their staff. During all of these meetings, information handouts and public surveys were given with the opportunity for feedback. KBRPC also created a survey through "Survey Monkey" and posted a link on their website and social media page.

KBRPC received 30 completed public surveys during the planning period. Respondents were most concerned with severe thunderstorms, flooding, extreme temperatures, drought, severe winter weather, and tornados. Many respondents indicated that the highly likely and likely events included flooding, severe thunderstorms, severe winter weather, and tornados. They also indicated that the most unlikely events would be levee and dam failure.

The top three projects most considered for FEMA Hazard Mitigation Assistance Grants were Minor Localized Flood Reduction Projects, Soil Erosion Stabilization, and New Tornado Safe Room Construction.

When asked to comment on any other issues that the Vernon County Hazard Mitigation Planning Committee should consider in developing a strategy to reduce future losses caused by hazard events, the following was mentioned:

- 1. Damages on graders and equipment made during clean-up of a disaster would be repaired;
- 2. A defined plan is needed in the event of a disaster to identify the location and needs of those with disabilities, and to consider the accessibility of disaster plans for those with special needs;
- 3. Community safe rooms are needed throughout the County;
- 4. Upgrades needed to community facilities to house those in times of a disaster;
- 5. Storm sirens and county wide notifications needed in all communities in the County;
- 6. Each community in the county should have a satellite phone for communication purposes;
- 7. Culverts 18" and over need to be repaired.

Public input and comments have been integrated into the Risk Assessment chapter and have also contributed to the action items listed for each participating jurisdiction.

#### Step 3: Coordinate with Other Departments and Agencies and Incorporate

## Existing Information (Handbook Task 3)

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

As stated in Section 1.4, during the planning process, stakeholders were given opportunities to be involved in the process. Non-profit organizations, Chambers of Commerce, neighboring communities, businesses, school districts, local and regional agencies, private organizations, fire departments, ambulance districts, and other stakeholders were notified via emails, letters, and public notices in the newspaper.

Stakeholders who were invited to participate in the Vernon County Hazard Mitigation Plan include:

- On My Own, Inc.
- Vernon County Senior Center
- Vernon County Health Department
- Red Cross
- Nevada/Vernon County Chamber of Commerce
- 3M
- Healthy Nevada
- Nevada Daily Mail
- Sac-Osage Electric Cooperative
- Empire District Gas
- Liberty Utilities
- Alliance Water Resources
- CDL Electric
- Missouri Department of Transportation
- Vernon County Commissioners & County Departments
- Cities and Villages Located in Vernon County
- Nevada Housing Authority
- Heartland Behavioral Health
- Nevada Nursing and Rehab
- Nevada Regional Medical Center
- Cottey College
- Fire Departments of Vernon County
- Emergency Management Directors
- Townships of Vernon County
- Vernon County Sheriff's Department
- Nevada Police Department

Each of the stakeholders listed above received an email from KBRPC inviting them to attend the meetings with a public notice and agenda for the public meetings. Those that attended the meetings

were given a public survey and asked for their input during the planning process.

#### Coordination with FEMA Risk MAP Project

Vernon County is in the Preliminary Phase. The data is completed and awaiting the Letter of Final Determination which is slated to be approved October 17, 2019.



Integration of Other Data, Reports, Studies, and Plans

The MPC researched available plans, studies, reports, and technical information during development of this update. The intent was to identify existing date and information, shared objectives, and past and ongoing activities that would add to this update. A significant amount of information presented in the Plan has been updated and revised based on the review and incorporation of existing plans, studies, reports and technical information. Additional input was solicited from other agencies and organizations that were not able to attend the public meetings by KBRPC reaching out via phone to schedule a one-on-one meeting or through phone conversations. In addition to information available from local jurisdictions, a number of data sources, reports, studies, and plans were used in updating the plan. Every attempt was made to gather the best available data to develop the vulnerability assessment and identify assets in the county. The most recent Missouri State Hazard Plan was reviewed and referenced throughout this document. Other data sources used for this

plan update include the following:

- Vernon County Local Emergency Operations Plan
  - Vernon County Emergency Management is set up along the following functional segments; direction and control; communications and warning; emergency public information; damage assessment; law enforcement; fire and rescue; civil disorder; hazardous materials response; public works; evacuation; in-place sheltering; reception and care; health and medical terrorism, response; and resources and supply. This plan also defines lines of succession for the continuity of government operations during a disaster as well as the preservation of records and the logistics of administrative functions such as procedures for obtaining temporary use of facilities.
- Current Missouri State Hazard Mitigation Plan
- State Department of Natural Resources (DNR) dam information, the National Inventory of Dams (NID), dam inspection reports
- Missouri Department of Conservation (MDC) wildfire statistics
- Wildland/Urban Interface and Intermix areas from the SILVIS Lab-Department of Forest Ecology and Management—University of Wisconsin

## Step 4: Assess the Hazard: Identify and Profile Hazards (Handbook Task 5)

At the second MPC meeting, January 18, 2018, profiles of identified hazards from the 2013 plan were presented. Storm event data from the National Center for Environmental Information for the five-year period since the adoption of the 2013 plan were included in the hazard profiles. The presentation incorporated data from studies, reports, and technical information available throughout internet research. During the process of identifying hazards the MPC reviewed:

- Previous disaster declarations in the county
- Hazards in the most recent State Hazard Mitigation Plan
- Hazards identified in the previously approved hazard mitigation plan

The MPC was asked to prioritize the identified hazards on the probability of occurrence, human impact and property impact. Additional information about the conclusions drawn can be found in the Risk Assessment chapter of the plan.

## Step 5: Assess the Problem: Identify Assets and Estimate Losses

Identified assets in the planning area include population, structures, critical facilities and infrastructure, and other important assets that may be at risk to hazards. The inventory of assets for each jurisdiction was derived from parcel data from the Vernon County Assessor, local jurisdiction data collection questionnaires, and the US Census.

Each jurisdiction in Vernon County submitted a data collection questionnaire to KBRPC. Potential Losses were estimated based on insured values or replacement cost. Loss estimates are included in each hazard profile of the Risk Assessment Chapter.

## Step 6: Set Goals (Handbook Task 6)

The MPC conducted a discussion session during the second meeting on January 18, 2018 to

discuss the current goals for Vernon County. It was determined that the previous goals were set in the 2013 Plan did not seem to fit the actions Vernon County would like to have in place. The MPC opted to replace the six previous goals set in the 2013 Plan and replace them with four new goals that would better fit Vernon County as a whole. The MPC held an additional meeting on March 21, 2018 to review the 2013 work plan and review each action one by one to discuss changes that should be made, additions, and deletions.

The Plan's updated goals for Vernon County are as follows:

- Goal 1 Protect the lives and livelihoods of all citizens.
- **Goal 2** Mitigate the effects of future natural hazards in the County.
- **Goal 3** Strengthen communication and awareness to coordinate participation between public agencies, citizens, non-profit organizations, business and industry.
- **Goal 4** Develop written policies and procedures for preparedness and mitigation response to natural disasters.

### Step 7: Review Possible Mitigation Actions and Activities

The MPC meeting on March 21, 2018 consisted primarily of discussion of mitigation strategies and actions from the 2013 plan, and any relevant new actions. For a comprehensive range of mitigation actions to consider, the MPC reviewed the following information during the meeting:

- A list of actions proposed in the previously approved mitigation plan and discussing each individually regarding progress made and continued relevance;
- Input during meetings;
- Responses to the Data Collection Questionnaire

Jurisdiction representatives on the MPC were encouraged to review the details of the risk assessment vulnerability analysis specific to their jurisdiction, and the previously identified mitigation actions prior to the meeting. Representatives were provided a link to the FEMA publication, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).* This document was developed by FEMA as a resource for identification of a range of potential mitigation actions which identified community support for specific mitigation actions were reviewed and discussed.

During the meeting, few new actions were proposed by the committee, but numerous actions were reworded. Much of the discussion surrounded making actions SMART: specific, measurable, achievable, relevant, and time-bound. KBRPC staff provided some recommended altered language for some items, and general discussions by the MPC provided some significant changes to many actions.

## Step 8: Draft an Action Plan

During Meeting #3, March 21, 2018, covered several topics. Representatives were provided with blank STAPLEE scoring sheets to complete for each new or revised action item identified for their jurisdiction. The method was used to develop a priority score for the proposed actions. These worksheets clarified what department would be responsible for implementing each actions, potential funding sources, timelines, and local planning mechanisms for implementation KBRPC and the MPC worked together as a group to complete the worksheets and to provide information pertaining to implementing those actions.

on a local level. The actions plans are listed for each jurisdiction in the Mitigation Strategy chapter.

## Step 9: Adopt the Plan (Handbook Task 8)

During the meeting March 21, 2018, KBRPC discussed the plan adoption process. KBRPC then attended meetings with each jurisdiction to address any questions pertaining to the plan adoption and presented a Resolution for each jurisdiction to be approved and adopted by the governing body of each jurisdiction in order to be eligible for Hazard Mitigation Assistance. Adoption Resolutions are included in **Appendix C**.

## Step 10: Implement, Evaluate, and Revise the Plan (Handbook Tasks 7 & 9)

During the meeting March 21, 2018, KBRPC staff discussed the FEMA action tracker site for assistance in implementing the mitigation actions. The MPC also discussed potential funding sources for mitigation projects, and the process for reviewing and monitoring the plan. The overall strategy has been updated and is presented in the Plan Maintenance Chapter of this plan.

# **2 PLANNING AREA PROFILE AND CAPABILITIES**

2 PLANN	2 PLANNING AREA PROFILE AND CAPABILITIES		
2.1 Verno	on County Planning Area Profile		
2.1.1	Geography, Geology and Topography	2.2	
2.1.2	Climate	2.4	
2.1.3	Population/Demographics	2.4	
2.1.4	History	2.5	
2.1.5	Public Schools	2.6	
2.1.6	Private schools	2.6	
2.1.7	Occupations	2.6	
2.1.8	Agriculture	2.7	
2.1.9	FEMA Hazard Mitigation Assistance Grants in Planning Area	2.7	
2.2 Jurisd	lictional Profiles and Mitigation Capabilities		
2.2.1	Unincorporated Vernon County	2.8	
2.2.2	City of Bronaugh	2.11	
2.2.3	Village of Metz	2.14	
2.2.4	City of Nevada		
2.2.5	City of Schell City		
2.2.6	City of Walker	2.21	
2.2.7	Village of Deerfield	2.23	
2.2.8	City of Richards	2.25	
2.2.9	City of Sheldon	2.27	
2.2.10	Village of Stotesbury	2.29	
2.2.11	Sac Osage Electric Cooperative	2.37	
2.2.12	Public School District Profiles and Mitigation Capabilities	2.37	

# 2.1 Vernon County Planning Area Profile

Vernon County is located in west-central Missouri and is bordered by Bates, St. Clair, Cedar, and Barton Counties in Missouri and Bourbon county in Kansas. Figure 2.1 is a map of the Vernon County planning area that includes the cities and villages.

#### Figure 2.1. Map of Vernon County



According to the 2016 US Census, Vernon County, MO has a population of 20,836 people with a median age of 40.7 and a median household income of \$40,655. In 2000, the population of Vernon County, MO was 20,454, an increase of 1.3%. This is much less than the growth experienced by both the state of Missouri and the United States as a whole over the same time period, which were 8.9 and 14.8 percent respectively.

The median household income for Vernon County was \$40,655 in 2016. This is well below the state and national medians of \$48,173 and \$53,889. The

# ደለ Metz Stotesbury Horton Harwoox Richards Compton Junction Walker Deerfield evada Moundville Milo Bronaugh Sheldon Legend Unincorporated Cor \$7,0 Reads 1 mph = 26 378 73 fee City Brondary County Boundary

percentage growth in median household income experienced by Vernon County has increased by 26 percent, while the state and national growth was 27 and 28.3 percent.

The median property value in Vernon County, MO is \$93,200, which is 0.45 times smaller than the national average of \$205,000. Between 2015 and 2016 the median property value increased from \$90,800 to \$93,200, a 2.64% increase. This is significantly lower than the State of Missouri as a whole (\$138,400) and the United States (\$178,600).

# 2.1.1 Geography, Geology and Topography

Vernon County is located in west/central Missouri with an area covering 837 square miles, of which 834 square miles is land and 3.1 square miles is water. The county is primarily rural with

#### Vernon County, MO

42 percent being urban.

The county is bordered on the north by Bates County, on the west by Kansas, on the south by Barton County, on the east by Cedar and St. Clair Counties. The City of Nevada is the county seat and the most populous community in the county.

Vernon County consists of one ecological land types according to the *Atlas of Missouri Ecoregions*, published by the Missouri Department of Conservation.

#### **Osage Plains (Cherokee Plains)**

The Osage Plains is an unglaciated prairie that extends from west-central Missouri into eastern Kansas and northeastern Oklahoma. A flat to gently rolling landscape underlain mainly by Pennsylvanian-age shale, sandstone, and limestone, the Osage Plains was historically nearly pure tallgrass prairie. Today, most of the pre-settlement prairie is pasture or cropland, but some large prairie blocks still exist. The Cherokee Plains Subsection is one continuous plain of very low relief (usually less than 80 feet) mostly on Pennsylvanian sandstones and shale, but with associated thinbedded limestone and coal. Streams have hardly dissected the surface, and valleys are topographically subdued. Wetlands are abundant throughout the wide, flat alluvial plains. Clay-pan soils add further distinction to the subsection. This subsection lies in west-central Missouri, west of the Ozark Highlands. It comprises major portions of Henry, St. Clair, Bates, Vernon, and Barton Counties, and small portions of Pettis, Cedar, Dade, and Jasper Counties.

**Figure 2.2** is a map of the watershed boundaries in Missouri. Vernon County is part of the Little Osage River Watershed, Marmaton, and the Harry S Truman Watershed.



Source: https://dnr.mo.gov/omw/OMWWatersheds.htm

# 2.1.2 Climate

Mean annual precipitation for Vernon County is 44.69 inches. The wettest months are May-June; 63 percent of the annual precipitation occurs during the six warmer months of the year. Annual snowfall averages 11.2 inches. Mean January minimum daily temperature is 19°. Mean July maximum daily temperature is 90°.

Vernon County lies in a Humid Temperate climate and is vulnerable to northern pressure systems in the winter and strong pressure and storm systems from the Gulf of Mexico and the Great Plains region of the central United States. While Vernon County does have extreme variations in weather at times, there is a seasonal pattern.

# 2.1.3 Population/Demographics

**Table 2.1** provides the total county population and the populations for each city, village and unincorporated county for 2000, 2010 and 2016 with the number and percentage of change from 2000 to 2015. It is estimated that the unincorporated population of the county is 11,079 people. Overall the county has increased its population by 3.44%.

				2000-2010 #	2000-2010 %
Jurisdiction	2000 Population	2010 Population	2016 Population	Change	Change
Vernon County	20,454	21,159	20,836	705	3.44
City of Bronaugh	246	249	246	3	1.2
Village of Deerfield	75	81	80	6	8.0
Village of Metz	69	49	48	-20	-29.0
City of Nevada	8,633	8,381	8,224	-252	-2.9
City of Richards	95	97	96	2	2.1
City of Schell City	285	249	246	-36	-12.6
City of Sheldon	531	543	532	12	2.3
Village of Stotesbury	43	18	18	-25	-58.1
City of Walker	274	270	267	-4	-1.5

Table 2.1.	Vernon County	y Population	2000-2010 b	y Community	,
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Source: U.S. Bureau of the Census, Decennial Census, \*population includes the portions of these cities in adjacent counties

Vernon County's population under age 5 is 1,251 people according to the 2010 US Census Bureau. This is 6.0% of the population, which is very close to the state and national averages of 6.2% and 6.3%. The county has a slightly higher elderly population, or those above the age of 65, at 17.5% of the population compared to the 14.9% for Missouri and 14.1% for the nation.

Vernon County has a total of 8,204 households. Of which 5,532 are considered family households, 1,189 households who have children who are under the age of 18 years old 2,672 non-family households. The county has a total of 9,488 housing units and 8,204 are considered occupied at an average household size of 2.51.

The University of South Carolina developed an index to evaluate and rank the ability to respond to, cope with, recover from, and adapt to disasters. The index synthesizes 30 socioeconomic variables which research literature suggests contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. SoVI ® data sources include primarily those from the United States Census Bureau.

The index is a comparative metric that facilitates the examination of the differences in social vulnerability among counties. SoVI® is a valuable tool for policy makers and practitioners. It

graphically illustrates the geographic variation in social vulnerability. SoVI® also is useful as an indicator in determining the differential recovery from disasters.

Vernon County's SoVI® score is 2.619999886, placing them in the 87.1 percentile when compared to the rest of the nation. This score means that 87.1 percent of the nation is more resilient to hazards and disasters. The main determinants of the score are qualities of the population based on race and class, wealth, elderly residents, Hispanic ethnicity, special needs individuals, Native American ethnicity, and the service industry employment.

**Table 2.2** provides additional demographic and economic indicators for Vernon County and incorporated communities compared to the state of Missouri and the United States. The county as a whole had a higher percentage of unemployed and families living below the poverty level that the state of Missouri or the United States. In terms of education, the percentage of population in the county that were high school graduates were higher than the state of Missouri and the United States. The percentage of the county population that spoke a language other than English in the home was considerably lower than the state of Missouri and significantly lower than the United States.

Table 2.2.	Unemployment, Pover	ty, Education	, and Language Percentage	Demographics,	Vernon
County, N	Vissouri				

Jurisdiction	Total in Labor Force	Percent of Population Unemployed	Percent of Families Below the Poverty Level	Percentage of Population (High School graduate)	Percentage of Population (Bachelor's degree or higher)	Percentage of population (spoken language other than English
Vernon County	9,818	2.8%	10.8%	87.4%	16.2%	4.1%
Bronaugh	116	3.1%	32.8%	68.1%	8.3%	1.4%
Deerfield	76	4.9%	18.8%	89.4%	17.0%	0%
Metz	45	5.6%	13.5%	63.0%	0.0%	0%
Nevada	4,350	5.8%	24.3%	89.9%	15.3%	2.8%
Richards	83	13.3%	44.6%	93.4%	21.1%	0%
Schell City	231	5.9%	26.1%	80.1%	9.4%	4.7%
Sheldon	507	4.7%	25.5%	80.3%	5.5%	0%
Stotesbury	9	50.0%	77.2%	81.8%	0.0%	0%
Walker	259	2.9%	25.3%	74.9%	10.2%	1.3%
Missouri	4,823,223	6.6%	10.46%	18.9%	19.3%	5.95%
United States	253,323,709	7.4%	10.2%	17.29%	21%	21.15%

Source: U.S. Census, 2012-2016 American Community Survey, 5-year Estimates.

# 2.1.4 History

Vernon County, Missouri was organized on February 27, 1855 and is named for Miles Vernon, a three-time Missouri Senator from Laclede County. In the same year commissioners bought 50 acres for \$250 as the site of the county seat. The county seat was first called Fairview, and later changed to Nevada City. Nevada was named after a California town made famous by the Gold Rush, Nevada City was home to some 450 residents at the outset of the Civil War. Now known as just Nevada, and is located in the center of the county. The county was developed for agriculture use and is still largely rural.

Vernon County suffered considerable damage during the American Civil War. Guerrillas and
insurgents had waged raids against Union troops and carried out personal vendettas in the county. On May 23, 1863, Union Army soldiers burned the county seat of Nevada, along with the courthouse, in retaliation. Vernon County was one of four Missouri counties that were completely depopulated by Union General Thomas Ewing's General Order No. 11 (1863), which ordered the people to evacuate in order to end support for Confederate guerrillas operating in the area. Most of the residents would not be allowed to return to their homes until after the Civil War ended in May 1865. For lack of a suitable building in Nevada, the first post-war sessions of the County Court were held at Little Osage. The second courthouse was built in the center of the Nevada City square in 1868. The present Vernon County Courthouse was completed in 1908, and was the first courthouse built in Missouri after the Civil War and for a time, viewed as the finest in this part of the state.

## 2.1.5 Public Schools

- Nevada R-V School District
  - Bryan Elementary Grade School: (PreK-1)
  - Nevada R-V Pre-School
  - Benton Elementary Grade School: (K-2)
  - Truman Elementary Grade School: (3-5)
  - Nevada Middle School: (6-8)
  - Nevada High School: (9-12)
  - Heartland R-V School
  - Cedar Ridge School
  - Nevada Regional Technical Center (high school-adult)
- Northeast Vernon County R-1 School District
  - Schell City Campus: (PreK-6)
  - Walker Campus: (7-12)
- Bronaugh R-VII School District
  - Elementary (PreK-6)
  - Junior High/High School (7-12)
- Sheldon R-VIII School District
  - Sheldon Elementary (PreK-6)
  - Sheldon High School (7-12)

## 2.1.6 Private schools

- St. Mary Elementary School (PreK-5)
- Calvary Christian School (K-1, 4, 7, 10-11)
- Nevada Seventh-Day Adventist Christian School (2-7)
- Bible Baptist Academy (1-8)

## 2.1.7 Occupations

Occupation information for the Vernon County labor force comes from the American Community Survey 5-year estimates 2011-2015. Management, Business, Science, and Arts Occupations includes education and healthcare practitioner and technician occupations among others. Service Occupation includes healthcare support and protective services, such as firefighters and law enforcement in addition to food preparation and personal care services. The other occupation classifications are well defined. **Table 2.3** contains occupation statistics for the participating incorporated cities and the county as a whole.

### Table 2.3. Occupation Statistics, Vernon County, Missouri

Place	Management, Business, Science, and Arts Occupations	Service Occupations	Sales and Office Occupations	Natural Resources, Construction, and Maintenance Occupations	Production, Transportation, and Material Moving Occupations
Vernon County	2,113	948	1201	1046	1074
Bronaugh	23	10	16	10	14
Deerfield	1	3	0	2	7
Metz	0	0	0	0	4
Nevada	661	486	365	315	294
Richards	7	9	2	2	2
Schell City	14	11	3	1	21
Sheldon	25	38	22	13	62
Stotesbury	0	0	0	0	0
Walker	19	12	9	15	30

Source: U.S. Census, 2012-2016 American Community Survey, 5-year Estimates.

## 2.1.8 Agriculture

According to the United States Department of Agriculture 2012 Census, there were 1,356 farms covering 418,614 acres in Vernon County. The average farm size was 309 acres, which is above the average farm size in the state of Missouri at 309 acres. The average market value of products sold in Vernon County in 2012 was \$208,997,000. Of the total about 30% (\$62,212,000) was from crop sales and the other 70% (\$146,785,000) came from livestock sales. The average sales per farm in Vernon County was \$665,520.

The top crop items in Vernon County were (acres):

- 1. Soybeans for beans- 72,742 acres
- 2. Forage-land used for all hay and haylage, grass silage and green chop -53,129 acres
- 3. Corn for grain-55,041
- 4. Wheat for grain, all-21,968 acres
- 5. Land in Orchards-6,869 acres

The top livestock items in Vernon County were (numbers):

- 1. Hogs and pigs—397,6210
- 2. Cattle and Calves 63,052
- 3. Sheep and lambs—3,294
- 4. Layers inventory—3,284
- 5. Broilers and other meat-type chickens-2,025

Vernon County ranks 6th in Missouri in value of agriculture products sold, and 504 in the U.S. In addition, 23% of principal operators reported their primary occupation was something other than farming.

### 2.1.9 FEMA Hazard Mitigation Assistance Grants in Planning Area

Vernon County has not received any previous FEMA Hazard Mitigation Assistance Grant funding in the planning area. The table below was intentionally left blank.

#### Table 2.4.FEMA HMA Grants in Vernon County from 1993-2017

Project Type	Sub applicant	Award Date	Project Total
Total			
		8	

Source: Missouri State Emergency Management Agency,

https:/www.fema.gov/openfema-dataset-hazard-mitigation-grants-v1

## 2.2 Jurisdictional Profiles and Mitigation Capabilities

This section will include individual profiles for each participating jurisdiction. It will also include a discussion of previous mitigation initiatives in the planning area. There will be a summary table indicating specific capabilities of each jurisdiction that relate to their ability to implement mitigation opportunities. The unincorporated county is profiled first, followed by the incorporated communities, the special districts, and the public school districts.

## 2.2.1 Unincorporated Vernon County

Vernon County's jurisdictions includes all unincorporated areas within the county boundaries. Vernon County is a third class county in Missouri. The governing body of Vernon County is the County Commission. The Commission consists of a Presiding Commissioner, Northern Commissioner and Southern Commissioner.

The County Commission is the administrative authority. It is an elected three-member governing body with a Presiding Commissioner, Northern Commissioner and Southern Commissioner. The Commission established County policy, approves and adopts the annual budget for all county operations, approves actual expenditures for each department, purchasing, facilities and ground maintenance, ensures county-wide compliance with numerous statutory requirements and acts as liaison with county boards, commissions, and other governmental entities. The departments/staff in Vernon County include:

- County Commission
- County Assessor
- Circuit Clerk
- County Clerk
- Collector
- Coroner
- Prosecuting Attorney
- Public Administrator
- Recorder
- Sheriff
- Surveyor
- Treasurer/Collector
- Emergency Management

- Local Emergency Planning Committee
- Community Emergency Response Team
- NFIP Flood Plain Administrator
- Circuit Court Judge
- Deputy County Clerk
- Probate/Magistrate Judge
- Probate/Magistrate Clerk

#### **Mitigation Initiatives/Capabilities**

- National Flood Insurance Program
- Zoning/Land Use Restrictions
- Public Education/Awareness
- Land Use Program

The County NFIP Floodplain Administrator accepts, evaluates and monitors land use proposals and enforces the NFIP floodplain regulations.

The County Emergency Management Director (EMD) coordinates with local government officials and cooperating private organizations to: 1) prevent avoidable disasters and reduce the vulnerability of the residents to any disaster that may strike; 2) establish capabilities for protecting citizens from the effects of disasters; 3) respond effectively to the actual occurrence of disasters; and 4) provide for recovery in the aftermath of any emergency involving extensive damage within the county. The EMD is responsible for the development and maintenance of the Local Emergency Operations Plan.

**Table 2.5** provides information on Vernon County's mitigation capabilities based on the Data

 Collection Questionnaire.

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Operations Plan	No
County Emergency Operations Plan	Yes, 10/2017 City and County have combined plan
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Yes
Economic Development Plan	Yes, 2016, encompassed in KBRPC's regional plan
Transportation Plan	Yes, encompassed in KBRPC's regional plan
Land-use Plan	Yes, 2015 Joint Land Use Study
Flood Mitigation Assistance (FMA) Plan	Yes, 1992, renewed
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy

Table 2.5.	Unincorporate	d Vernon Count	v Mitigation Ca	apabilities

	No
Building Codo	No
Electricity Code	NO 1002
	165, 1992
	NO
Nuisense Ordinance	No
Nuisance Ordinance	NO
Storm water Ordinance	NO
Drainage Ordinance	NO Otatus Instruction Data of Decomposition Dation
Capability Cite Disp. Deview Deguinements	Status including Date of Document or Policy
Site Plan Review Requirements	NO No
Historic Preservation Ordinance	NO
	NO
Iowa Wetlands and Riparian Areas Conservation Plan	NO
Debris Management Plan	
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	Yes
Hazard Awareness Program	No
National Weather Service (NWS) Storm Readv	Yes, 2004
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No. No county-wide district, rural fire districts only
Economic Development Program	No
Land Use Program	Yes, 2015 Joint Land Use Study
Public Education/Awareness	Yes
Property Acquisition	No
Planning/Zoning Boards	Yes, Enhanced Enterprise Zone
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
(Local/County/Regional)	
Mutual Aid Agreements	No
Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	N/A
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	Yes
FEMA Flood Insurance Study (Detailed)	No
FEMA Flood Insurance Study (Detailed) Evacuation Route Map	No No
FEMA Flood Insurance Study (Detailed) Evacuation Route Map Critical Facilities Inventory	No No Yes, 2015 Disaster Related Land Use Plan
FEMA Flood Insurance Study (Detailed) Evacuation Route Map Critical Facilities Inventory Vulnerable Population Inventory	No No Yes, 2015 Disaster Related Land Use Plan No
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map	No No Yes, 2015 Disaster Related Land Use Plan No Yes
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         Staff/Department	No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         Staff/Department         Building Code Official	No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         Staff/Department         Building Code Official         Building Inspector	No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         No
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         Staff/Department         Building Code Official         Building Inspector         Mapping Specialist (GIS)	No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         Staff/Department         Building Code Official         Building Inspector         Mapping Specialist (GIS)         Engineer	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         Staff/Department         Building Code Official         Building Inspector         Mapping Specialist (GIS)         Engineer         Development Planner	No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         No         No
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         Staff/Department         Building Code Official         Building Inspector         Mapping Specialist (GIS)         Engineer         Development Planner         Public Works Official	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         No         Yes, full time         No         Yes, Full time-Road and Bridge Foreman
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         Staff/Department         Building Code Official         Building Inspector         Mapping Specialist (GIS)         Engineer         Development Planner         Public Works Official         Emergency Management Coordinator	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         No         Yes, full time         No         Yes, Full time-Road and Bridge Foreman         Yes, Part time
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         Staff/Department         Building Code Official         Building Inspector         Mapping Specialist (GIS)         Engineer         Development Planner         Public Works Official         Emergency Management Coordinator         NFIP Floodplain Administrator	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         No         Yes, Full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         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	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         Yes, Full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time         No
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         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	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         Yes, Full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time         No         No
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         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	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         Yes, Full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time         No
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         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	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         Yes, Full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time         No         No         No         No         No         No         No         Yes, Part time         Yes, Vernon County LEPC
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         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	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         Yes, full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time         No         No     <
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         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	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         Yes, full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time         No
FEMA Flood Insurance Study (Detailed)Evacuation Route MapCritical Facilities InventoryVulnerable Population InventoryLand Use MapStaff/DepartmentBuilding Code OfficialBuilding InspectorMapping Specialist (GIS)EngineerDevelopment PlannerPublic Works OfficialEmergency Management CoordinatorNFIP Floodplain AdministratorBomb and/or Arson SquadEmergency Response TeamHazardous Materials ExpertLocal Emergency Planning CommitteeCounty Emergency Management CommissionSanitation DepartmentTransportation Department	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         Yes, full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time         No
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         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	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         Yes, full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time         No         No <tr< td=""></tr<>
FEMA Flood Insurance Study (Detailed)         Evacuation Route Map         Critical Facilities Inventory         Vulnerable Population Inventory         Land Use Map         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         Housing Department	No         No         Yes, 2015 Disaster Related Land Use Plan         No         Yes         Status Including Date of Document or Policy         No         No         Yes, full time         No         Yes, full time-Road and Bridge Foreman         Yes, Part time         Yes, Part time         No         No     <

Regional Planning Agencies	Yes, KBRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy
American Red Cross	No, Regionally only
Salvation Army	No, Regionally only
Capability	Status Including Date of Document or Policy
Veterans Groups	Yes, Various groups-VFW, Vietnam, etc.
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes, Vernon County/Nevada Chamber of Commerce
Community Organizations (Lions, Kiwanis, etc.	Yes, Scouts, Optimists, Lions, Rotary, Eagles, Elks
	····, ····, ···, ···, ···, ···, ···, ·
Local Funding Availability	Status Including Date of Document or Policy
Local Funding Availability Ability to apply for Community Development Block	Status Including Date of Document or Policy Yes
Local Funding Availability Ability to apply for Community Development Block Grants	Status Including Date of Document or Policy Yes
Local Funding Availability Ability to apply for Community Development Block Grants Ability to fund projects through Capital Improvements	Status Including Date of Document or Policy       Yes       Yes
Local Funding Availability Ability to apply for Community Development Block Grants Ability to fund projects through Capital Improvements funding	Status Including Date of Document or Policy       Yes       Yes
Local Funding Availability Ability to apply for Community Development Block Grants Ability to fund projects through Capital Improvements funding Authority to levy taxes for a specific purpose	Status Including Date of Document or Policy       Yes       Yes       Yes
Local Funding Availability Ability to apply for Community Development Block Grants Ability to fund projects through Capital Improvements funding Authority to levy taxes for a specific purpose Fees for water, sewer, gas, or electric services	Status Including Date of Document or Policy       Yes       Yes       Yes       No
Local Funding Availability         Ability to apply for Community Development Block         Grants         Ability to fund projects through Capital Improvements funding         Authority to levy taxes for a specific purpose         Fees for water, sewer, gas, or electric services         Impact fees for new development	Status Including Date of Document or Policy       Yes       Yes       Yes       Yes       Yes       Yes       Yes
Local Funding Availability         Ability to apply for Community Development Block         Grants         Ability to fund projects through Capital Improvements funding         Authority to levy taxes for a specific purpose         Fees for water, sewer, gas, or electric services         Impact fees for new development         Ability to incur debt through general obligation bonds	Status Including Date of Document or Policy       Yes       Yes       No       Yes       Yes
Local Funding Availability         Ability to apply for Community Development Block         Grants         Ability to fund projects through Capital Improvements funding         Authority to levy taxes for a specific purpose         Fees for water, sewer, gas, or electric services         Impact fees for new development         Ability to incur debt through general obligation bonds         Ability to incur debt through special tax bonds	Status Including Date of Document or Policy       Yes
Local Funding Availability         Ability to apply for Community Development Block         Grants         Ability to fund projects through Capital Improvements funding         Authority to levy taxes for a specific purpose         Fees for water, sewer, gas, or electric services         Impact fees for new development         Ability to incur debt through general obligation bonds         Ability to incur debt through private activities	Status Including Date of Document or Policy       Yes       Yes       Yes       No       Yes       Yes

Source: Data Collection Questionnaire, 2018

### 2.2.2 City of Bronaugh

The City of Bronaugh is located in the southwest portion of Vernon County with a population of 246 people in both the 2010 and 2000 census. The Mayor and the City Aldermen are the policy making bodies in the city government. The Mayor and City Aldermen are elected directly and serve staggered two year terms. Bronaugh also has the following staff positions:

- City Clerk
- Collector
- Sewer Superintendent
- Treasurer
- Water Superintendent
- Fire Chief
- Emergency Management Director
- Flood Plain Administrator

Mitigation capabilities include:

- Public education programs; Fire protection week
- County Emergency Operations Plan
- County Mitigation Plan
- Flood Mitigation Plan
- Zoning/Land Use restrictions
- Codes Building Site/Design
- National Flood Insurance Program
- Floodplain Ordinance
- Critical Facilities Inventory

**Table 2.6** provides information on Bronaugh's mitigation capabilities based on the Data

 Collection Questionnaire.

Table 2.6.E	Bronaugh Mitigation	Capabilities
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Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Operations Plan	No
County Emergency Operations Plan	Yes
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Yes
Economic Development Plan	No
Transportation Plan	Yes, encompassed in KBRPC's regional plan
Land-use Plan	Yes, June, 2015
Flood Mitigation Assistance (FMA) Plan	Yes
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	No
Building Code	Yes
Floodplain Ordinance	Yes, 2014
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	Yes, Zoning Ordinances
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating	Yes
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	7
Economic Development Program	Yes, encompassed in KBRPC's regional plan
Land Use Program	No
Public Education/Awareness	Yes. Fire protection week
Property Acquisition	Νο
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No

Engineering Studies for Streams	No
(Local/County/Regional)	NO
Mutual Aid Agreements	No
Studies/Reports/Mans	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Mans	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Poute Man	No
Critical Facilities Inventory	Vos
Vulnerable Population Inventory	No
Land Use Man	No
Staff/Department	Status Including Date of Document or Policy
Building Code Official	
Building Inspector	No
Manning Recialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	Ves Part Time
NEIP Floodplain Administrator	Ves Part Time
Romb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Yes KBRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy
American Red Cross	No
Salvation Army	No
Capability	Status Including Date of Document or Policy
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes Vernon County/Nevada Chamber of Commerce
Community Organizations (Lions Kiwanis etc.	Yes Scouts Ontimists Lions Rotary Fagles Elks
Local Funding Availability	Status Including Date of Document or Policy
Ability to apply for Community Development Block	Yes
Grants	
Ability to fund projects through Capital Improvements	No
funding	
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
	No
Ability to incur dobt through general obligation hands	NO NO
Ability to incur debt through general obligation bonds	NO NO
Ability to incur debt through special tax bonds	NO
Ability to incur debt through private activities	NO NO
Ability to withhold spending in hazard prone areas	INU

Source: Data Collection Questionnaire 2018

### 2.2.3 Village of Metz

The Village of Metz is located in the northwestern area of Vernon County. The population of Metz in 2010 the census was 49 and according to the 2000 census the population was 69 people, which is a 29% decrease. The Village Board of Trustees are the decision making bodies in the village government. The Village of Metz has the following offices and staff positions:

- Village Board of Trustees
- City Clerk

Mitigation capabilities include:

• One public designated tornado shelter-Petty Street Methodist Church

**Table 2.7** provides information on the Village of Metz's mitigation capabilities based on the Data

 Collection Questionnaire.

Table 2.7.	Metz Mitigation	Capabilities
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Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Operations Plan	No
County Emergency Operations Plan	Yes
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Yes
Economic Development Plan	Encompassed in KBRPC's regional plan
Transportation Plan	Encompassed in KBRPC's regional plan
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	Little Osage, 2006
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	No
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy

Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	No
NFIP Community Rating System (CRS) Participating	No
Hazard Awaropose Program	No
National Weather Service (NWC) Storm Deady	No
National Weather Service (NWS) Storm Ready	NO
	NO
ISO Fire Rating	No
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
(Local/County/Regional)	
Mutual Aid Agreements	No
Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
EEMA Flood Insurance Study (Detailed)	No
Evacuation Pouto Man	No
Critical Excilition Inventory	No
Vulnerable Deputation Inventory	No
	NO
Land Use Map	NO Otatua kaskalian Data af Dagumant an Daliau
Staff/Department	Status including Date of Document of Policy
Building Code Official	NO
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	Yes, Part-time county-wide
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Yes, KBRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy
American Red Cross	
Salvation Army	No
Canability	Status Including Date of Decument or Boliev
Veterana Croupa	No
Environmental Organization	NO
	NU No
	NO NE
Neighborhood Associations	NO
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	No
	Status Including Date of Document or Policy

Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	No
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Ability to incur debt through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire 2018

## 2.2.4 City of Nevada

The City of Nevada is located in central part of Vernon County. Nevada is the county seat, and according to the 2010 census, the city's population is 8,381 people. The City of Nevada has experienced a 3% decrease in population since the 2000 census when they had a population of 8,633. The Mayor and the City Council are the policy making bodies in the city government. Nevada has the following staff positions:

- City Clerk
- City Council
- City Administrator
- Street Superintendent
- Fire Chief
- Sewer Superintendent
- Water Superintendent
- Fire Chief
- Treasurer
- Police Chief
- Flood Plain Administrator
- Emergency Management Director

Mitigation capabilities include:

- Nine (9) Outdoor warning sirens, located at: 1.) North side of Atlantic Street, south of the Truck Wash, near Osage Street. 2.) North of Atlantic Street, west of Ash Street, near skate park. 3.) In the Nevada Police Station parking lot, north of Austin Street, west of Ash Street. 4.) North side of Pine Street, south of Austin, near Ramey's Supermarket. 5.) South of Austin Street, west of Barrett Street, in the 3M parking lot. 6.) East of Perkins Street, north of Cherry Street, near Cottey College. 7.) West of West Street, north of Edwards Street, behind the Bowman Building. 8.) Siren is inside Reed Field, between the ball field near the Frank E. Peters Golf Course. 9.) West of College Street and south of Ridge Street
- National Flood Insurance Program
- Building Code Effectiveness Grading (BCEG's)
- Economic Development Program
- Tree Trimming Ordinance
- City Emergency Operations Plan
- City Mitigation Plan
- Flood Mitigation Assistance
- Zoning/Land Use Restrictions
- Economic Development Program

• Public Education/Awareness

**Table 2.8** provides information on Nevada's mitigation capabilities based on the Data Collection Questionnaire.

<b>A</b>	
	Status including Date of Document of Policy
Planning Capabilities	
Comprenensive Plan	Yes, 1984, Updated in March 2017
Builder's Plan	NO
Capital Improvement Plan	Yes, 2018, completed every year by the City
Local Emergency Operations Plan	Yes, 2017, Part of Vernon County LEOP
County Emergency Operations Plan	NA
Local Recovery Plan	NO
County Recovery Plan	NO
Local Mitigation Plan	
	Yes, 2013 HMP, LEOP
Local Mitigation Plan (PDM)	
County Mitigation Plan (PDM)	Yes, 2013, same as LEOP, HMP
Economic Development Plan	Yes, encompassed in KBRPC's plan
I ransportation Plan	Yes, 2016 updated yearly, local, state, federally reviewed
Land-use Plan	Yes
Flood Mitigation Assistance (FMA) Plan	Yes, 1998
Watershed Plan	Yes, Marmaton Watershed, #10290104
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	Yes, updated as needed-Chapter 37 City Code
Building Code	IBC 2012 Electrical NEC 2011
Floodplain Ordinance	National Flood Disaster Program 1973
Subdivision Ordinance	Yes, Chapter 34 City Code
Tree Trimming Ordinance	Yes, Chapter 35 City Code
Nuisance Ordinance	Yes, Chapter 21 City Code
Storm Water Ordinance	Yes, addressed in several city codes
Drainage Ordinance	Yes, Section 28-43 City Code
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	Yes, City Code-Building/Fine
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	Yes, Planning & Zoning Commission
Codes Building Site/Design	Yes, Building/Fire Code Enforcement
National Flood Insurance Program (NFIP) Participant	Yes
NEIP Community Rating System (CRS) Participating	Yes CID #290442
Community	
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	5 Residential, 5 Commercial/Industrial
ISO Fire Rating	3 Effective $2/1/2018$
Economic Development Program	Ves City employee part time
Dublic Education/Awaranaca	Vos Firo/Polico
Property Acquisition	
Diapping/Zaping Boardo	NU Vac. both most monthly, ostablished by City Code
Fianning/Zoning Doards	res, both meet monthly, established by City Code

No

Stream Maintenance Program

Tree Trimming Program	No program, just ordinance
Engineering Studies for Streams	No
(Local/County/Regional)	
Mutual Aid Agreements	No
Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	Yes, 2013 HMP and LEOP
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	Yes, LEOP
Vulnerable Population Inventory	No
Land Use Map	Yes, updated periodically
Staff/Department	Status Including Date of Document or Policy
Building Code Official	Yes Full Time
Building Inspector	Yes, Full Time
Mapping Specialist (GIS)	Yes, Part Time
Engineer	Yes. Part Time
Development Planner	No
Public Works Official	Yes, Full Time
Emergency Management Coordinator	Yes, Part Time
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	Arson yes, Part Time
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	Yes, Part Time
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	Yes, Full Time
Economic Development Department	Yes, Part Time
Housing Department	Yes, Full Time
Planning Consultant	No
Regional Planning Agencies	Yes, KBRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes, several located throughout the City
Environmental Organization	No
Homeowner Associations	Yes
Neighborhood Associations	No
Chamber of Commerce	Yes, Vernon County/Nevada Chamber of Commerce
Community Organizations (Lions, Kiwanis, etc.)	Yes, several located throughout the City
Local Funding Availability	Status Including Date of Document or Policy
Ability to apply for Community Development Block	Yes
Grants	
Ability to fund projects through Capital Improvements	Yes
funding	
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes, water/sewer
Impact fees for new development	No
Ability to incur debt through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire 2018

## 2.2.5 City of Schell City

The City of Schell City is located in the north eastern corner of Vernon County. According to the 2010 census the city's population is 249 people. The City of Schell City has experienced a 14% decrease in

population since the 2000 census when they had a population of 285. The Board of Aldermen and the Mayor are the policy making bodies in the city government. Schell City has the following staff positions:

- City Clerk
- Board of Alderman
- Fire chief

Mitigation capabilities include:

- One (1) outdoor warning signals located west of Main Street and south of 2<sup>nd</sup> Street.
- Flood Mitigation Assistance Plan
- Nuisance Ordinance.
- Mutual Aid Agreements

**Table 2.9** provides information on Schell City's mitigation capabilities based on the Data Collection Questionnaire.

Table 2.9.	Schell City Mitigation Capabilities
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Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Operations Plan	No
County Emergency Operations Plan	Yes
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Yes
Economic Development Plan	Yes, encompassed in KBRPC's regional plan
Transportation Plan	Yes, encompassed in KBRPC's regional plan
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	2013 County HMP
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	No
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No

National Flood Insurance Program (NFIP) Participant	No
NEID Community Pating System (CRS) Participating	No
Community Calling System (CKS) Farticipating	
Hazard Awareness Program	No
National Weather Service (NW/S) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
	0
ISO File Ralling	o No
	NO
Lanu Ose Flogram	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
(Local/County/Regional)	10
Mutual Aid Agreements	Yes
Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Man	No
Critical Facilities Inventory	Yes, 2015 Disaster Related Land use Plan
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	Status Including Date of Document or Policy
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	Yes
Emorgonoy managomone oboramator	
NFIP Floodplain Administrator	No
NFIP Floodplain Administrator Bomb and/or Arson Squad	No No
NFIP Floodplain Administrator Bomb and/or Arson Squad Emergency Response Team	No No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert	No No No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee	No No No No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Management Commission	No No No No No No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Management Commission         Sanitation Department	No No No No No No No
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	No No No No No No No No
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	No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Transportation Department         Transportation Department         Economic Development Department         Housing Department	No
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         Planning Consultant	No
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         Planning Consultant         Regional Planning Agencies	No           Yes, KBRPC
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         County Emergency Planning Committee         County Emergency Management Commission         Sanitation Department         Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation	No           Yes, KBRPC           No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         County Emergency Planning Committee         County Emergency Management Commission         Sanitation Department         Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)	No         Yes, KBRPC         No         Status Including Date of Document or Policy
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         County Emergency Planning Committee         County Emergency Planning Committee         County Emergency Management Commission         Sanitation Department         Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross	No           Yes, KBRPC           No           Status Including Date of Document or Policy           No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         County Emergency Planning Committee         County Emergency Management Commission         Sanitation Department         Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army	No           Status Including Date of Document or Policy           No           No           No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Transportation Department         Transportation Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability	No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Transportation Department         Transportation Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Emergence and Power instruction	No           Status Including Date of Document or Policy           No           No           Status Including Date of Document or Policy           No           No           No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Planning Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organization	No           Status Including Date of Document or Policy           No           No           Status Including Date of Document or Policy           No           No
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         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organization         Homeowner Associations         Neidebarbarbard Ages cistions	No           Status Including Date of Document or Policy           No           No           Status Including Date of Document or Policy           No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organization         Homeowner Associations         Neighborhood Associations	No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Planning Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organization         Homeowner Associations         Neighborhood Associations         Chamber of Commerce	No           Status Including Date of Document or Policy           No
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Planning Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organization         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.	No         Status Including Date of Document or Policy         No         No     <
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Planning Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organization         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability	No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Polic
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Planning Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organization         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability         Ability to apply for Community Development Block	No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         Yes, Full Time (County Chamber)         No         Status Including Date of Document or Policy         Yes
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Planning Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability         Ability to apply for Community Development Block         Grants	No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         Yes         Yes
NFIP Floodplain Administrator         Bomb and/or Arson Squad         Emergency Response Team         Hazardous Materials Expert         Local Emergency Planning Committee         County Emergency Planning Committee         Planning Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability         Ability to apply for Community Development Block         Grants         Ability to fund projects through Capital Improvements	No         Status Including Date of Document or Policy         No         No         Status Including Date of Document or Policy         No         Yes, Full Time (County Chamber)         No         Status Including Date of Document or Policy         Yes         Yes

Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes, Billed Monthly
Impact fees for new development	No
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	Yes
Ability to withhold spending in hazard prone areas	No

### 2.2.6 City of Walker

The City of Walker is located in the east central part of Vernon County. According to the 2010 census the city's population is 270 people. The Walker has experienced a 1% decrease in population since the 2000 census when they had a population of 275. The Board of Aldermen and the Mayor are the policy making bodies in the city government. Walker has the following staff positions:

- City Clerk
- City Marshal
- Police Chief
- Sewer Superintendent
- Water Superintendent

Mitigation capabilities include:

- Nuisance Ordinance.
- Mutual Aid Agreements

 Table 2.10 provides information on Schell City's mitigation capabilities based on the Data

 Collection Questionnaire.

#### Table 2.10.Walker Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Operations Plan	Yes
County Emergency Operations Plan	Yes
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Yes
Economic Development Plan	Yes, encompassed in KBRPC's regional plan
Transportation Plan	Yes, encompassed in KBRPC's regional plan
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	No
Building Code Ordinance	No
Floodplain Ordinance	Yes
Subdivision Ordinance	No

Huisance Ordinance         Yes           Drainage Ordinance         Yes           State Status Including Date of Document or Policy         Status Including Date of Document or Policy           State Plan Review Requirements         No           Historic Preservation Ordinance         No           Landscage Ordinance         No           Landscage Ordinance         No           Long Weilands and Riparian Areas Conservation Plan         No           Lowa Weilands and Riparian Areas         No           Joing Biologie Ordinance         Yes           Codes Building SterDesign         No           Autonal Flood Insurance Program (NEIP) Participant         Yes           Community Rating System (CRS) Participant         Yes           Mational Vieoder Service (IWS) Storm Ready         No           Building Code Effectiveness Grading (BCE Gs)         No           Building Code Effectiveness Grading (BCE Gs)         No           Public Education/Wareness         No           Planting Zoring Boards         No           PlaningZoring Boards         No           PlaningZoring Boards         No           PlaningZoring Boards         No           States Mathemance Program         No           Placard Analysis/Risk Assessment (Locar)         <	Tree Trimming Ordinance	Yes
Biom Water Ordinance         Yes           Capability         Status Including Date of Document or Policy           Site Plan Review Requirements         No           Historic Preservation Ordinance         No           Landscape Ordinance         No           Landscape Ordinance         No           Landscape Ordinance         No           Date Metands and Reparian Areas Conservation Plan         No           Date Status Including Date of Document or Policy         ZoningLand Use Restrictions         Yes           Community         Tess Status Including Date of Document or Policy         ZoningLand Use Restrictions         Yes           Community         National Weather Service (NWS) Storm Ready         No         No           Building Code Effectiveness Crading (BCEGs)         No         No         Property Acquisition           Property Acquisition         No         No         Property Acquisition         No           Property Acquisition Streams         No         No         Property Acquisition Streams         No           Iducal CommyRegional)         No	Nuisance Ordinance	Yes
Drainage Ordinance         Yes           Capability         Status Including Date of Document or Policy           Site Plan Review Requirements         No           Historic Preservation Ordinance         No           Landscape Ordinance         No           Lows Votlands and Ripatian Areas Conservation Plan         No           Debris Management Plan         No           Program         Status Including Date of Document or Policy           ZoningLand Use Restrictions         Yes           Codes Building SterDossign         No           National Flood Insurance Program (NFIP) Participant         Yes           National Hoad Insurance Program (NFIP) Participant         Yes           Hazard Awareness Program (NFIP) Participant         Yes           Storiang Code Effectiveness Grading (BCEGs)         No           Iso Fire Rating         6           Economic Development Program         No           Property Acquisition         No           Property Acquisition         No           Stream Maintenance Program         No           Stream Maintenance Program         Yes           Engineering Studies for Streams         No           (Local/Courty/Regional)         No           Mutual Jid Agrerements         Yes	Storm Water Ordinance	Yes
Capability         Status Including Date of Document or Policy           Site Plan Review Requirements         No           Historic Preservation Ordinance         No           Landscape Ordinance         No           Uowa Wetanda and Riparian Areas Conservation Plan         No           Debris Management Plan         No           Program         Status Including Date of Document or Policy           Zoning Land Use Restrictions         Yes           Codes Building SterDesign         No           National Flood Insurance Program (NFIP) Participant         Yes           Community         Restrict/Status Including Date of Document or Policy           Mater Service (NWS) Storm Ready         No           National Weather Service (NWS) Storm Ready         No           Building Code Effectiveness Crading (BCEGs)         6           Economic Development Program         No           Land Use Program         No           Property Acquisition         No           Program Maintenance Program         No           Stream Maintenance Program         No           Stream Maintenance Program         No           Local/CourtyRegional)         No           Property Acquisition         No           Stream Maintenance         Yes	Drainage Ordinance	Ves
Site Prior Preservation Ordinance         No           Historic Preservation Ordinance         No           Landscape Ordinance         No           Lowa Vetlands and Riparian Areas Conservation Plan         No           Debris Maragement Plan         No           ZoningLand Use Restrictions         Yes           Codes Building SterDesign         No           National Flood Insurance Program (NFIP) Participant         Yes           Neine Program         Yes           Codes Building Code Effectiveness Grading (BCEGs)         No           National Flood Insurance Program (NFIP) Participant         Yes           Mational Work Program         No           Pational Work Program         No           Building Code Effectiveness Grading (BCEGs)         No           Land Use Program         No           Property Acquisition         No           Property Acquisition         No           Property Acquisition         No           Stream Maintenance Program         No           Stream Maintenance Program         Yes           Engineering Studies for Streams         No           Uscal Construct Regional Answers         No           Stream Maintenance Maps         No           Evacuation Route Map <td< td=""><td>Canability</td><td>Status Including Date of Document or Policy</td></td<>	Canability	Status Including Date of Document or Policy
Instruction         Inc.           Instruction         Instruction           Instruction         No           Landscape Ordinance         No           Iowa Wellands and Ripatian Areas Conservation Plan         No           Debris Management Plan         No           Program         Status Including Date of Document or Policy           Zoning/Land Use Restrictions         Yes           Codes Building Stet/Design         No           National Flood Insurance Program (NFIP) Participant         Yes           Community         Havard Awareness Program         No           Hazard Awareness Program         No         No           Building Code Effectiveness Grading (BCEGs)         No         No           Building Code Effectiveness Grading (BCEGs)         No         No           Property Acquisition         No         No         PlaningZoning Boards           Stream Maintenance Program         No         No         PlaningZoning Boards           Stream Maintenance Program         No         No         Property Acquisition           Vicoal/County/Regional)         No         No         No           Vicoal/Stream Maintenance Program         No         No           Hazard Analysis/Risk Assessment (Local)         No	Site Plan Review Requirements	No
Tission Trees reading         No           Landscape Ordinance         No           Lowa Vetlands and Riparian Areas Conservation Plan         No           Program         Status Including Date of Document or Policy           Zoning/Land Use Restrictions         Yes           Codes Building Ster/Design         No           National Flood Insurance Program (NFIP) Participating         Yes           Ordinal Vaather Service (NVS) Storm Ready         No           National Flood Effectiveness Grading (BCEGs)         No           Building Code Effectiveness         6           Economic Development Program         No           Land Use Program         No           Proble Education/Awareness         No           Property Acquisition         No           Property Acquisition         No           Tree Trimming Program         No           Status Including Date of Document or Policy         Hazard Analysis/Risk Assessment (Local)           No         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (Local)         No           FeMa Flood Insurance Study (Detailed)         No           Vulnerable Dopulation Inventory         No           Laad Use Ma	Historic Preservation Ordinance	No
Lansbage Columbra         No           Debits Management Plan         No           Program         Status Including Date of Document or Policy           ZoningLand Use Restrictions         Yes           Codes Building Site/Design         No           National Flood Insurance Program (NFIP) Participant         Yes           Codes Building Site/Design         No           National Flood Insurance Program (RFIP) Participant         Yes           Community         Awareness Program         No           National Weather Service (NWS) Stom Ready         No         No           Building Code Effectiveness Grading (BCEGs)         No         No           Building Code Effectiveness Grading (BCEGs)         No         No           Property Acquisition         No         No         Pathic Education/Awareness           Property Acquisition         No         No         Pathic Education/Awareness           Vibregram         Yes         Forintiming Program         No           PlaningZoning Boards         No         No           Studiestor Streams         No         No           Local/County/Regional)         No         Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (Local)         No         Hazard	Landscane Ordinance	No
Town overainse and partial Average conservation Field         No           Program         Status Including Date of Document or Policy           ZoningLand Use Restrictions         Yes           Codes Building Site/Design         No           National Flood Insurance Program (NFIP) Participant         Yes           NFIP Community Rating System (CRS) Participating         Yes           Hazard Avareness Program         No           National Flood Insurance Program (REIP) Participating         Yes           Codes Building Code Effectiveness Grading (BCEGs)         No           National Weather Service (NWS) Stom Ready         No           Roo Code Effectiveness Grading (BCEGs)         No           ISO Fire Rating         6           Economic Development Program         No           Property Acquisition         No           Property Acquisition         No           Presering Studies for Streams         No           Itree Timming Program         Yes           Studias/Reports/Maps         Status Including Date of Document or Policy           Mutad Ad Agreements         Yes           Studias/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Fedda Insurance Maps         No	Landscape Ordinance	No
Deuts management name         Two           Program         Status Including Date of Document or Policy           Zoning/Land Use Restrictions         Yes           Codes Building Site/Design         No           National Flood Insurance Program (NFIP) Participant         Yes           Construction         No           National Vavareness Program         No           Hazard Awareness Program         No           Building Code Effectiveness Grading (BCEGs)         No           ISO Fire Rating         6           Economic Development Program         No           Public Education/Awareness         No           Property Acquisition         No           Tree Trimming Program         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (Local)         No           FEMA Flood Insurance Maps         No           FEMA Flood Insurance Study (Detailed)         No           Critical Facilities Inventory	Debris Management Plan	No
Frogram         States including Date of Document of Policy           Codes Building Site/Design         No           National Flood Insurance Program (NFIP) Participant         Yes           NPTP Community Rating System (CRS) Participating Community         Yes           Hazard Awareness Program         No           Hational Hock (NWS) Storm Ready         No           Building Code Effectiveness Grading (BCEGs)         No           Building Code Effectiveness Grading (BCEGs)         No           ISO Fire Rating         6           Economic Development Program         No           Public Education/Awareness         No           Property Acquisition         No           Preperty Acquisition         No           Preperty Acquisition         No           Preperty Acquisition         No           Preperty Acquisition         No           Studes/Report/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (Local)         No           FEMA Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         No           Statios Including Date of Document or Policy	Brogram	Status Including Data of Document or Bolicy
Automic Ster         No           National Flood insurance Program (NFIP) Participatin         Yes           NFIP Community         No           National Flood insurance Program (NFIP) Participatin         Yes           Nether Community         No           National Weather Service (NWS) Storm Ready         No           Building Code Effectiveness Grading (BCEGs)         No           Building Code Effectiveness Grading (BCEGs)         No           Land Use Program         No           Public Education/Awareness         No           Properly Acquisition         No           Stream Maintenance Program         No           Properly Acquisition         No           Stream Maintenance Program         No           Properly Acquisition         No           Tree Timming Program         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Cucnty)         No           Hazard Analysis/Risk Assessment (Cucnty)         No           Flew Flood Insurance Maps         No           Flew Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Pacilities Inventory         No           Land Use	Zoning/Land Lico Postrictions	
Codes Soliding Site Design         No           National Flood Insurance Program (NFIP) Participanting         Yes           United Stating System (CRS) Participating         Yes           Hazard Awareness Program         No           National Weather Service (NVS) Storm Ready         No           Building Code Effectiveness Grading (BCEGs)         No           Economic Development Program         No           Land Use Program         No           Public Education/Awareness         No           Property Acauisition         No           Property Acauisition         No           Property Acquisition         No           Property Acquisition         No           Stream Maintenance Program         No           Iterain Maintenance Program         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (County)         No           Hazard Analysis/Risk Assessment (County)         No           FetMA Flood Insurance Maps         No           FetMA Flood Insurance Maps         No           Vulnerable Population Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         Y	Codes Building Site/Design	No
National Proof insulator Program (NPP) Patropant         Pes           NEIP Community         No           Hazard Awareness Program         No           National Weather Service (NWS) Storm Ready         No           Building Code Effectiveness Grading (BCEGs)         No           ISO Fire Rating         6           Economic Development Program         No           Public Education/Awareness         No           Property Acquisition         No           Property Acquisition         No           Property Acquisition         No           Tree Timming Program         Yes           Engineering Studies for Streams         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (Local)         No           FEMA Flood Insurance Maps         No           Feda Isonance Maps         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Statif/Department         Status Including Date of Document or Policy           Building Code Official         No	Notional Flood Insurance Dragram (NEID) Derticipant	NO
NFIP Community Rating System (CRS) Participating         Yes           Hazard Awareness Program         No           National Weather Service (NWS) Storm Ready         No           Building Code Effectiveness Grading (BCEGs)         No           ISO Fire Rating         6           Economic Development Program         No           Land Use Program         No           Public Education/Awareness         No           Property Acquisition         No           Property Acquisition         No           Planing/Zoning Boards         No           Stream Maintenance Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           (Local/County/Regional)         No           Mutual Aid Agreements         Yes           StudiesReports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (County)         No           Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Evacuation Route Map         No           Vulnerable Population Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         Yes, 2015 Disaster Related Land use Plan </td <td></td> <td></td>		
Community         No           National Weather Service (NWS) Storm Ready         No           Building Code Effectiveness Grading (BCEGs)         No           ISO Fire Rating         6           Economic Development Program         No           Land Use Program         No           Public Education/Awareness         No           Property Acquisition         No           Property Acquisition         No           Tree Trimming Program         No           Tree Trimming Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           (Local/County/Regional)         Yes           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           FEMA Flood Insurance Study (Detailed)         No           Femanoe Maps         No           Cartical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Stat/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Code Official	NFIP Community Rating System (CRS) Participating	Yes
Hazard Awareness Program         No           National Westher Service (WWS) Stom Ready         No           Building Code Effectiveness Grading (BCEGs)         No           ISO Fire Rating         6           Economic Development Program         No           Land Use Program         No           Public Education/Awareness         No           Property Acquisition         No           Property Acquisition         No           Property Acquisition         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           (Local/County/Regional)         No           Mutual Ald Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Flead Insurance Maps         No           Flead Fload Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Uhareable Population Inventory         No           Statuf Depulation Inventory         No           Building Code Official         No           Building Specialist (GIS)	Community	
National Weather Service (NWS) Storm Ready         No           Building Code Effectiveness Grading (BCEGs)         No           Land Use Program         No           Public Education/Awareness         No           Property Acquisition         No           Property Acquisition         No           Stream Maintenance Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           (Local/County/Regional)         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Fredom Insurance Study (Detailed)         No           Fredom Insurance Study (Detailed)         No           Evacuation Route Map         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer	Hazard Awareness Program	No
Building Code Effectiveness Grading (BCEGs)         No           ISO Fire Raing         6           Economic Development Program         No           Land Use Program         No           Proble Education/Awareness         No           Property Acquisition         No           Property Acquisition         No           Property Acquisition         No           Stream Maintenance Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           (Local/County/Regional)         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           FEMA Flood Insurance Maps         No           FetMA Flood Insurance Maps         No           Staff/Department         Status Including Date of Document or Policy           Biding Code Official         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Specialist (GIS)         No           Engineer         No </td <td>National Weather Service (NWS) Storm Ready</td> <td>No</td>	National Weather Service (NWS) Storm Ready	No
ISO Fire Rating       6         Economic Development Program       No         Land Use Program       No         Public Education/Awareness       No         Property Acquisition       No         Property Acquisition       No         Stream Maintenance Program       No         Tree Trimming Program       Yes         Engineering Studies for Streams       No         (Local/Count/Regional)       Yes         Mutual Aid Agreements       Yes         Studies/Reports/Maps       Status Including Date of Document or Policy         Hazard Analysis/Risk Assessment (Local)       No         Hazard Analysis/Risk Assessment (County)       No         FEMA Flood Insurance Study (Detailed)       No         Evacuation Route Map       No         Critical Facilities Inventory       Yes, 2015 Disaster Related Land use Plan         Vulnerable Population Inventory       No         Statf/Department       Status Including Date of Document or Policy         Building Code Official       No         Building Code Official       No         Building Code Official       No         Public Works Official       Yes         Borneer       No         Devetopment Planner       No     <	Building Code Effectiveness Grading (BCEGs)	NO
Economic Development Program         No           Land Use Program         No           Property Acquisition         No           Property Acquisition         No           Property Acquisition         No           Stream Maintenance Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           (Local/County/Regional)         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (Local)         No           FEMA Flood Insurance Maps         No           FeMA Flood Insurance Study (Detailed)         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Statf/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Code Official         No           Engineer         No           Development Planner         No	ISO Fire Rating	6
Land Use Program         No           Public Education/Awareness         No           Property Acquisition         No           Planning/Zoning Boards         No           Stream Maintenance Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           (Local/County/Regional)         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           FEMA Flood Insurance Maps         No           Feda Flood Insurance Maps         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Land Use Map         No           Status Including Date of Document or Policy           Building Inspector         No           Regional field         No           Status Including Date of Document or Policy           Building Inspector         No           Regional field         No           Development Planner         No           Public Works Official         Yes           Bord and Amainist	Economic Development Program	No
Public Education/Awareness         No           Property Acquisition         No           Property Acquisition         No           Stream Maintenance Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           (Local/County/Regional)         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           FEMA Flood Insurance Maps         No           FeMA Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Land Use Map         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engreer         No           Development Planner         No           Public Works Official         Yes<	Land Use Program	No
Property Acquisition         No           Planning/Zoning Boards         No           Stream Maintenance Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           (Local/County/Regional)         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           FEMA Flood Insurance Maps         No           Fread Analysis/Risk Assessment (County)         No           FeMA Flood Insurance Maps         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Development Planner         No           Public Works Official         Yes           Bomb and/or Arson Squad         No           Erregrency Response Team </td <td>Public Education/Awareness</td> <td>No</td>	Public Education/Awareness	No
Planning/Zoning Boards         No           Stream Maintenance Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams (Local/Courly/Regional)         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (Local)         No           Flood Insurance Maps         No           FEMA Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Public Works Official         Yes           Mapping Specialist (GIS)         No           Engineer         No           Public Works Official         Yes           Borb and/or Arson Squad         No           Emergency Response Team	Property Acquisition	No
Stream Maintenance Program         No           Tree Trimming Program         Yes           Engineering Studies for Streams         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           Flood Insurance Maps         No           FeMA Flood Insurance Study (Detailed)         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Land Use Map         No           Statius Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Development Planner         No           Public Works Official         Yes           Born and/or Arson Squad         No           Emergency Management Coordinator         Yes           Bornb and/or Arson Squad         No           Emergency Response Team         Yes           Bornb and/or Arson Squad         No	Planning/Zoning Boards	No
Tree Trimming Program         Yes           Engineering Studies for Streams (Local/County/Regional)         No           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           Flood Insurance Maps         No           FEMA Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Land Use Map         No           Building Code Official         No           Building Code Official         No           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Emergency Management Coordinator         Yes           NFIP Floodplain Administrator         Yes           Bomb and/or Arson Squad         No           Emergency Response Tam         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No           County Em	Stream Maintenance Program	No
Engineering Studies for Streams         No           (Local/County/Regional)         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           Flood Insurance Maps         No           FeMA Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Land Use Map         No           Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Engineer         No           Development Planner         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           Bomb and/or Arson Squad         No           Emergency Planning Committee         No           County Emergency Planning Com	Tree Trimming Program	Yes
(Local/County/Regional)         Yes           Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           FEMA Flood Insurance Maps         No           FetMA Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Code Official         No           Building Inspector         No           Building Inspector         No           Development Planner         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           Bomb and/or Arson Squad         No           Emergency Response Team         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No           County Emergency Management Commission         No	Engineering Studies for Streams	No
Mutual Aid Agreements         Yes           Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           Flood Insurance Maps         No           FEMA Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Land Use Map         No           Statius Including Date of Document or Policy           Building Inspector         No           Statius Including Date of Document or Policy           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Development Planner         No           Public Works Official         Yes           Bomb and/or Arson Squad         No           Emergency Management Coordinator         Yes           Bomb and/or Arson Squad         No           Emergency Response Team         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No <tr< td=""><td>(Local/County/Regional)</td><td></td></tr<>	(Local/County/Regional)	
Studies/Reports/Maps         Status Including Date of Document or Policy           Hazard Analysis/Risk Assessment (Local)         No           Hazard Analysis/Risk Assessment (County)         No           Flood Insurance Maps         No           Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Land Use Map         No           Statf/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           Public Morks Official         Yes           Bomb and/or Arson Squad         No           Emergency Response Team         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No           County Emergency Management Commission         No           Sariation Department         No           Economic Developmen	Mutual Aid Agreements	Yes
Hazard Analysis/Risk Assessment (Local)       No         Hazard Analysis/Risk Assessment (County)       No         Flood Insurance Maps       No         FEMA Flood Insurance Study (Detailed)       No         Critical Facilities Inventory       Yes, 2015 Disaster Related Land use Plan         Vulnerable Population Inventory       No         Land Use Map       No         Staff/Department       Status Including Date of Document or Policy         Building Code Official       No         Building Inspector       No         Public Works Official       No         Development Planner       No         Public Works Official       Yes         Bord Andonistrator       Yes         Bomb and/or Arson Squad       No         Emergency Response Team       Yes         Hazardous Materials Expert       No         Local Emergency Management Commission       No         County Emergency Management Commission       No         Satistion Department       No         Energency Response Team       Yes         Hazardous Materials Expert       No         Local Emergency Management Commission       No         Satistion Department       No         Transportation Department       No<	Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (County)         No           Flood Insurance Maps         No           FEMA Flood Insurance Study (Detailed)         No           Evacuation Route Map         No           Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Land Use Map         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           NFIP Floodplain Administrator         Yes           Bomb and/or Arson Squad         No           Local Emergency Planning Committee         No           Local Emergency Planning Committee         No           County Emergency Management Commission         No           Sanitation Department         No           Transportation Department         No           Economic Development Department         No           Transportation Department         No           Planning Agencies         Yes,	Hazard Analysis/Risk Assessment (Local)	No
Flood Insurance Maps       No         FEMA Flood Insurance Study (Detailed)       No         Evacuation Route Map       No         Critical Facilities Inventory       Yes, 2015 Disaster Related Land use Plan         Vulnerable Population Inventory       No         Land Use Map       No         Staff/Department       Status Including Date of Document or Policy         Building Code Official       No         Building Specialist (GIS)       No         Engineer       No         Development Planner       No         Public Works Official       Yes         Emergency Management Coordinator       Yes         NFIP Floodplain Administrator       Yes         Bomb and/or Arson Squad       No         Hazardous Materials Expert       No         Local Emergency Planning Committee       No         County Emergency Management Commission       No         Sanitation Department       No         Economic Development Department       No         Economic Development Department       No         Razidous Materials Expert       No         Local Emergency Planning Committee       No         County Emergency Management Commission       No         Sanitation Department       No	Hazard Analysis/Risk Assessment (County)	No
FEMA Flood Insurance Study (Detailed)       No         Evacuation Route Map       No         Critical Facilities Inventory       Yes, 2015 Disaster Related Land use Plan         Vulnerable Population Inventory       No         Staff/Department       Status Including Date of Document or Policy         Building Inspector       No         Building Inspector       No         Mapping Specialist (GIS)       No         Engineer       No         Development Planner       No         Public Works Official       Yes         Bomb and/or Arson Squad       No         Emergency Response Team       Yes         Hazardous Materials Expert       No         Local Emergency Planning Committee       No         County Emergency Planning Committee       No         Transportation Department       No         Planning Consultant       No         Pl	Flood Insurance Maps	No
Evacuation Route Map       No         Critical Facilities Inventory       Yes, 2015 Disaster Related Land use Plan         Vulnerable Population Inventory       No         Land Use Map       No         Statf/Department       Status Including Date of Document or Policy         Building Code Official       No         Building Code Official       No         Building Inspector       No         Mapping Specialist (GIS)       No         Development Planner       No         Public Works Official       Yes         Emergency Management Coordinator       Yes         Borb and/or Arson Squad       No         Emergency Response Team       Yes         Hazardous Materials Expert       No         Local Emergency Planning Committee       No         County Emergency Management Commission       No         Sanitation Department       No         Transportation Department       No         Planning Consultant       No         Planning Consultant       No         Planning Agencies       Yes, KBRPC         Historic Preservation       No         Anerican Red Cross       No	FEMA Flood Insurance Study (Detailed)	No
Critical Facilities Inventory         Yes, 2015 Disaster Related Land use Plan           Vulnerable Population Inventory         No           Land Use Map         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Development Planner         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           Bomb and/or Arson Squad         No           Emergency Response Team         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No           County Emergency Management Commission         No           Sanitation Department         No           Transportation Department         No           Feoronic Development Department         No           Housing Department         No           Planning Consultant         No           Regional Planning Agencies         Yes, KBRPC           Historic Preservation         No	Evacuation Route Map	No
Vulnerable Population Inventory         No           Land Use Map         No           Statf/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Development Planner         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           NFIP Floodplain Administrator         Yes           Bomb and/or Arson Squad         No           Emergency Response Team         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No           County Emergency Management Commission         No           Statiation Department         No           Transportation Department         No           Housing Department         No           Planning Consultant         No           Planning Agencies         Yes, KBRPC           Historic Preservation         No           American Red Cross         No	Critical Facilities Inventory	Yes, 2015 Disaster Related Land use Plan
Land Use Map         No           Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Development Planner         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           Bomb and/or Arson Squad         No           Emergency Response Team         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No           County Emergency Management Cormission         No           Statistion Department         No           Transportation Department         No           Economic Development Department         No           Housing Department         No           Planning Consultant         No           Planning Agencies         Yes, KBRPC           Historic Preservation         No           American Red Cross         No	Vulnerable Population Inventory	No
Staff/Department         Status Including Date of Document or Policy           Building Code Official         No           Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Development Planner         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           NFIP Floodplain Administrator         Yes           Bomb and/or Arson Squad         No           Emergency Response Team         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No           County Emergency Management Cormission         No           Statistion Department         No           Transportation Department         No           Economic Development Department         No           Housing Department         No           Planning Consultant         No           Regional Planning Agencies         Yes, KBRPC           Historic Preservation         No           American Red Cross         No	Land Use Map	No
Building Code Official       No         Building Inspector       No         Mapping Specialist (GIS)       No         Engineer       No         Development Planner       No         Public Works Official       Yes         Emergency Management Coordinator       Yes         NFIP Floodplain Administrator       Yes         Bomb and/or Arson Squad       No         Emergency Response Team       Yes         Hazardous Materials Expert       No         Local Emergency Planning Committee       No         County Emergency Management Commission       No         Sanitation Department       No         Transportation Department       No         Housing Department       No         Housing Department       No         Planning Consultant       No         Planning Agencies       Yes, KBRPC         Historic Preservation       No         American Red Cross       No	Staff/Department	Status Including Date of Document or Policy
Building Inspector         No           Mapping Specialist (GIS)         No           Engineer         No           Development Planner         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           Bomb and/or Arson Squad         No           Emergency Response Team         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No           County Emergency Management Commission         No           Sanitation Department         No           Transportation Department         No           Housing Department         No           Planning Consultant         No           Planning Agencies         Yes, KBRPC           Historic Preservation         No           Anerican Red Cross         No	Building Code Official	No
Mapping Specialist (GIS)         No           Engineer         No           Development Planner         No           Public Works Official         Yes           Emergency Management Coordinator         Yes           NFIP Floodplain Administrator         Yes           Bomb and/or Arson Squad         No           Emergency Response Team         Yes           Hazardous Materials Expert         No           Local Emergency Planning Committee         No           County Emergency Management Commission         No           Sanitation Department         No           Transportation Department         No           Housing Department         No           Historic Preservation         No           Regional Planning Agencies         Yes, KBRPC           Historic Preservation         No           Non-Governmental Organizations (NGOs)         Status Including Date of Document or Policy	Building Inspector	No
EngineerNoDevelopment PlannerNoPublic Works OfficialYesEmergency Management CoordinatorYesImage: NFIP Floodplain AdministratorYesNFIP Floodplain AdministratorYesBomb and/or Arson SquadNoEmergency Response TeamYesHazardous Materials ExpertNoLocal Emergency Planning CommitteeNoCounty Emergency Management CommissionNoSanitation DepartmentNoTransportation DepartmentNoHousing DepartmentNoHousing DepartmentNoPlanning ConsultantNoRegional Planning AgenciesYes, KBRPCHistoric PreservationNoNoStatus Including Date of Document or PolicyAmerican Red CrossNo	Mapping Specialist (GIS)	No
Development PlannerNoPublic Works OfficialYesEmergency Management CoordinatorYesNFIP Floodplain AdministratorYesBomb and/or Arson SquadNoEmergency Response TeamYesHazardous Materials ExpertNoLocal Emergency Planning CommitteeNoCounty Emergency Management CommissionNoSanitation DepartmentNoTransportation DepartmentNoHousing DepartmentNoHousing DepartmentNoHousing DepartmentNoHousing DepartmentNoHousing DepartmentNoHousing DepartmentNoHousing DepartmentNoHousing DepartmentNoHousing DepartmentNoHistoric PreservationNoMon-Governmental Organizations (NGOs)Status Including Date of Document or PolicyAmerican Red CrossNo	Engineer	No
Public Works Official       Yes         Emergency Management Coordinator       Yes         NFIP Floodplain Administrator       Yes         Bomb and/or Arson Squad       No         Emergency Response Team       Yes         Hazardous Materials Expert       No         Local Emergency Planning Committee       No         County Emergency Management Commission       No         Sanitation Department       No         Transportation Department       No         Housing Department       No         Housing Department       No         Planning Consultant       No         Regional Planning Agencies       Yes, KBRPC         Historic Preservation       No         Non-Governmental Organizations (NGOs)       Status Including Date of Document or Policy         American Red Cross       No	Development Planner	No
Finite United StateNoEmergency Management CoordinatorYesNFIP Floodplain AdministratorYesBomb and/or Arson SquadNoEmergency Response TeamYesHazardous Materials ExpertNoLocal Emergency Planning CommitteeNoCounty Emergency Management CommissionNoSanitation DepartmentNoTransportation DepartmentNoEconomic Development DepartmentNoHousing DepartmentNoPlanning ConsultantNoRegional Planning AgenciesYes, KBRPCHistoric PreservationNoNon-Governmental Organizations (NGOs)Status Including Date of Document or Policy	Public Works Official	Yes
NFIP Floodplain AdministratorYesBomb and/or Arson SquadNoEmergency Response TeamYesHazardous Materials ExpertNoLocal Emergency Planning CommitteeNoCounty Emergency Management CommissionNoSanitation DepartmentNoTransportation DepartmentNoEconomic Development DepartmentNoHousing DepartmentNoPlanning ConsultantNoPlanning AgenciesYes, KBRPCHistoric PreservationNoNoNoNoNoRegional Planning AgenciesYes, KBRPCHistoric PreservationNoNoNoNoNoNoNoNoNoNoNoRegional Planning AgenciesYes, KBRPCHistoric PreservationNoNoNoNo-Governmental Organizations (NGOs)Status Including Date of Document or PolicyAmerican Red CrossNo	Emergency Management Coordinator	Yes
Bomb and/or Arson Squad       No         Emergency Response Team       Yes         Hazardous Materials Expert       No         Local Emergency Planning Committee       No         County Emergency Management Commission       No         Sanitation Department       No         Transportation Department       No         Economic Development Department       No         Housing Department       No         Planning Consultant       No         Planning Agencies       Yes, KBRPC         Historic Preservation       No         No       No         Regional Planning Agencies       Yes, KBRPC         Historic Preservation       No         No       No         No       No         Regional Planning Agencies       Yes, KBRPC         Historic Preservation       No         No       No         No       No         No       No         No       No         Regional Planning Agencies       Yes, KBRPC         Historic Preservation       No         No       No         No       No         No       No         No       No      <	NFIP Floodplain Administrator	Yes
Emergency Response Team       Yes         Hazardous Materials Expert       No         Local Emergency Planning Committee       No         County Emergency Management Commission       No         Sanitation Department       No         Transportation Department       No         Economic Development Department       No         Housing Department       No         Planning Consultant       No         Planning Agencies       Yes, KBRPC         Historic Preservation       No         No-Governmental Organizations (NGOs)       Status Including Date of Document or Policy         American Red Cross       No	Bomb and/or Arson Squad	No
Hazardous Materials Expert       No         Local Emergency Planning Committee       No         County Emergency Management Commission       No         Sanitation Department       No         Transportation Department       No         Economic Development Department       No         Housing Department       No         Planning Consultant       No         Planning Agencies       Yes, KBRPC         Historic Preservation       No         No-Governmental Organizations (NGOs)       Status Including Date of Document or Policy         American Red Cross       No	Emergency Response Team	Yes
Local Emergency Planning Committee     No       County Emergency Management Commission     No       Sanitation Department     No       Transportation Department     No       Economic Development Department     No       Housing Department     No       Planning Consultant     No       Regional Planning Agencies     Yes, KBRPC       Historic Preservation     No       No-Governmental Organizations (NGOs)     Status Including Date of Document or Policy	Hazardous Materials Expert	No
County Emergency Management Commission       No         Sanitation Department       No         Transportation Department       No         Economic Development Department       No         Housing Department       No         Planning Consultant       No         Regional Planning Agencies       Yes, KBRPC         Historic Preservation       No         No       No         No       No         Regional Planning Agencies       Yes, KBRPC         Historic Preservation       No         No       No         No       No         No       No         Regional Planning Agencies       Yes, KBRPC         Historic Preservation       No         No       No         No-Governmental Organizations (NGOs)       Status Including Date of Document or Policy         American Red Cross       No	Local Emergency Planning Committee	No
Sanitation Department     No       Transportation Department     No       Economic Development Department     No       Housing Department     No       Planning Consultant     No       Regional Planning Agencies     Yes, KBRPC       Historic Preservation     No       No     No       No     No	County Emergency Management Commission	No
Transportation Department     No       Economic Development Department     No       Housing Department     No       Planning Consultant     No       Regional Planning Agencies     Yes, KBRPC       Historic Preservation     No       Non-Governmental Organizations (NGOs)     Status Including Date of Document or Policy       American Red Cross     No	Sanitation Department	No
Economic Development Department     No       Housing Department     No       Planning Consultant     No       Regional Planning Agencies     Yes, KBRPC       Historic Preservation     No       Non-Governmental Organizations (NGOs)     Status Including Date of Document or Policy       American Red Cross     No	Transportation Department	No
Housing Department     No       Planning Consultant     No       Regional Planning Agencies     Yes, KBRPC       Historic Preservation     No       Non-Governmental Organizations (NGOs)     Status Including Date of Document or Policy       American Red Cross     No	Economic Development Department	No
Planning Consultant     No       Regional Planning Agencies     Yes, KBRPC       Historic Preservation     No       Non-Governmental Organizations (NGOs)     Status Including Date of Document or Policy       American Red Cross     No	Housing Department	No
Regional Planning Agencies     Yes, KBRPC       Historic Preservation     No       Non-Governmental Organizations (NGOs)     Status Including Date of Document or Policy       American Red Cross     No	Planning Consultant	No
Historic Preservation     No       Non-Governmental Organizations (NGOs)     Status Including Date of Document or Policy       American Red Cross     No	Regional Planning Agencies	Yes. KBRPC
Non-Governmental Organizations (NGOs)         Status Including Date of Document or Policy           American Red Cross         No	Historic Preservation	No
American Red Cross	Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy
	American Red Cross	No

Salvation Army	No
Capability	Status Including Date of Document or Policy
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes, Full Time (County Chamber)
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	Status Including Date of Document or Policy
Ability to apply for Community Development Block	Yes
Grants	
Ability to fund projects through Capital Improvements	Yes
funding	
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes, Billed Monthly
Impact fees for new development	No
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

## 2.2.7 Village of Deerfield

The Village of Deerfield is located in the west central part of Vernon County. According to the 2010 census the city's population is 81 people. Village of Deerfield has experienced a 7% decrease in population since the 2000 census when they had a population of 75. The Chairman and the four council members are the policy making bodies in the city government. Village of Deerfield has the following staff positions:

• Village Clerk

Mitigation capabilities include:

- Uses County Emergency Operations Plan
- Volunteer Fire Department

**Table 2.11** provides information on Deerfield's mitigation capabilities based on the Data

 Collection Questionnaire.

#### Table 2.11.Deerfield Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Operations Plan	No
County Emergency Operations Plan	Yes, 2013 County HMP
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	N/A
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Yes
Economic Development Plan	Yes, encompassed in KBRPC's regional plan
Transportation Plan	Yes, encompassed in KBRPC's regional plan
Land-use Plan	No

Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Eacilities Plan	No
(Mitigation/Response/Recovery)	
Relicios/Ordinanco	Status Including Data of Document or Policy
Building Code Ordinance	No
Eloodolain Ordinance	No
Subdivision Ordinance	No
	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Canability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Rinarian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Lise Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	No
NEID Community Dation Contains (ODC) Darticination	
NFIP Community Rating System (CRS) Participating	NO
	Na
Hazard Awareness Program	NO
National Weather Service (NWS) Storm Ready	NO
Building Code Effectiveness Grading (BCEGS)	NO
ISO Fire Rating	N/A
Economic Development Program	No
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO NE
Stream Maintenance Program	NO
Free mining Program	NO
Engineering Studies for Streams	NO
(Local/County/Regional)	Na
Mutual Ald Agreements	NO Status Including Data of Decument or Baliau
Studies/Reports/Maps	Status including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	NO
Flood Insurance Mana	NO
Flood insurance maps	NU NI-
FEMA Flood Insurance Study (Detailed)	NO
Evacuation Route Map	NO Ven 2015 Dispeter Delated Landwar Dist
Critical Facilities Inventory	Yes, 2015 Disaster Related Land use Plan
vulnerable Population Inventory	NO No
Lanu Use Map	INU
Stan/Department	Status Including Data of Decument or Dellars
Building Code Official	Status Including Date of Document or Policy
Building Code Official	Status Including Date of Document or Policy No No
Building Code Official Building Inspector	Status Including Date of Document or Policy No No No
Building Code Official Building Inspector Mapping Specialist (GIS)	Status Including Date of Document or Policy No No No No
Building Code Official Building Inspector Mapping Specialist (GIS) Engineer	Status Including Date of Document or Policy       No       No       No       No
Building Code Official Building Inspector Mapping Specialist (GIS) Engineer Development Planner Dublio Works Official	Status Including Date of Document or Policy         No         No         No         No         No         No         No         No
Building Code Official         Building Inspector         Mapping Specialist (GIS)         Engineer         Development Planner         Public Works Official         Emergency Management Coordinates	Status Including Date of Document or Policy         No
Building Code Official         Building Inspector         Mapping Specialist (GIS)         Engineer         Development Planner         Public Works Official         Emergency Management Coordinator         NEIE Floadeling Administrator	Status Including Date of Document or Policy         No
Building Code Official         Building Inspector         Mapping Specialist (GIS)         Engineer         Development Planner         Public Works Official         Emergency Management Coordinator         NFIP Floodplain Administrator         Bandon Armon Served	Status Including Date of Document or Policy         No         No         No         No         No         No         Yes         No         No
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	Status Including Date of Document or Policy         No         No         No         No         No         Yes         No
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	Status Including Date of Document or Policy         No         No         No         No         No         No         Yes         No         No

Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Yes, KBRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy
American Red Cross	No
Salvation Army	No
Capability	Status Including Date of Document or Policy
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes, Full Time (County Chamber)
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	Status Including Date of Document or Policy
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements	No
funding	
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Ability to incur debt through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

## 2.2.8 City of Richards

The City of Richards is located in the west central part of Vernon County. According to the 2010 census the city's population is 97 people. City of Richards has experienced a 2% decrease in population since the 2000 census when they had a population of 95. The Chairman and the four Board of Aldermen are the policy making bodies in the city government. The City of Richards has the following staff positions:

• City Clerk

Mitigation capabilities include:

- Uses County Emergency Operations Plan
- Fire Department

**Table 2.12** provides information on Richard's mitigation capabilities based on the Data

 Collection Questionnaire.

Table 2.12.	Richards	Mitigation	Capabilities
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Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Operations Plan	No
County Emergency Operations Plan	Yes, County HMP 2013

Lagol Bagoyany Dian	No
	NU
County Recovery Plan	NO
Local Mitigation Plan	No
County Mitigation Plan	Yes, County HMP 2013
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	Yes, encompassed in KBRPC's regional plan
Transportation Plan	Yes, encompassed in KBRPC's regional plan
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	Yes
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
	No
City Code Ordinance	No
Electricity Code Ordinance	No
Subdivision Ordinance	NU
	NO
	NO NI
Nuisance Ordinance	NO
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Lise Restrictions	No
Codes Building Site/Design	No
I National Flood Incurance Drearam (NEID) Darticipant	No
National Flood Insurance Program (NFIP) Participant	No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating	No No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community	No No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program	No No No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready	No No No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs)	No No No No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs)	No No No No No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program	No No No No N/A
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program	No           No           No           No           No           N/A           No           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness	No           No           No           No           No           N/A           No           No           No           No           No           No           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition	No           No           No           No           N/A           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition	No           No           No           No           No           N/A           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition Planning/Zoning Boards	No           No           No           No           NA           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition Planning/Zoning Boards Stream Maintenance Program	No           No           No           No           No           N/A           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition Planning/Zoning Boards Stream Maintenance Program Tree Trimming Program	No           No           No           No           No           N/A           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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	No           No           No           No           N/A           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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)	No           No           No           No           No           N/A           No           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements	No           No           No           No           N/A           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements Studies/Reports/Maps	No         No         No         No         N/A         No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements Studies/Reports/Maps Hazard Analysis/Risk Assessment (Local)	No           No           No           No           No           N/A           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements Studies/Reports/Maps Hazard Analysis/Risk Assessment (Local) Hazard Analysis/Risk Assessment (County)	No           No           No           No           N/A           No
National Flood Insurance Program (NFIP) Participant         NFIP Community Rating System (CRS) Participating         Community         Hazard Awareness Program         National Weather Service (NWS) Storm Ready         Building Code Effectiveness Grading (BCEGs)         ISO Fire Rating         Economic Development Program         Land Use Program         Public Education/Awareness         Property Acquisition         Planning/Zoning Boards         Stream Maintenance Program         Engineering Studies for Streams         (Local/County/Regional)         Mutual Aid Agreements         Studies/Reports/Maps         Hazard Analysis/Risk Assessment (Local)         Hazard Analysis/Risk Assessment (County)         Flood Insurance Maps	No           No           No           No           No           N/A           No
National Flood Insurance Program (NFIP) Participant         NFIP Community Rating System (CRS) Participating         Community         Hazard Awareness Program         National Weather Service (NWS) Storm Ready         Building Code Effectiveness Grading (BCEGs)         ISO Fire 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 Aid Agreements         Studies/Reports/Maps         Hazard Analysis/Risk Assessment (Local)         Hazard Analysis/Risk Assessment (County)         Flood Insurance Maps         FEMA Flood Insurance Study (Detailed)	No           No           No           No           No           N/A           No           No
National Flood Insurance Program (NFIP) Participant         NFIP Community Rating System (CRS) Participating         Community         Hazard Awareness Program         National Weather Service (NWS) Storm Ready         Building Code Effectiveness Grading (BCEGs)         ISO Fire Rating         Economic Development Program         Land Use Program         Public Education/Awareness         Property Acquisition         Planning/Zoning Boards         Stream Maintenance Program         Engineering Studies for Streams         (Local/County/Regional)         Mutual Aid Agreements         Studies/Reports/Maps         Hazard Analysis/Risk Assessment (Local)         Hazard Analysis/Risk Assessment (County)         Flood Insurance Maps         FEMA Flood Insurance Study (Detailed)         Evacuation Route Map	No           No           No           No           No           N/A           No           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements <b>Studies/Reports/Maps</b> Hazard Analysis/Risk Assessment (Local) Hazard Analysis/Risk Assessment (County) Flood Insurance Maps FEMA Flood Insurance Study (Detailed) Evacuation Route Map Critical Facilities Inventory	No           No           No           No           No           N/A           No           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements <b>Studies/Reports/Maps</b> Hazard Analysis/Risk Assessment (Local) Hazard Analysis/Risk Assessment (County) Flood Insurance Maps FEMA Flood Insurance Study (Detailed) Evacuation Route Map Critical Facilities Inventory Vulnerable Population Inventory	No           No           No           No           No           N/A           No           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements Studies/Reports/Maps Hazard Analysis/Risk Assessment (Local) Hazard Analysis/Risk Assessment (Local) Flood Insurance Maps FEMA Flood Insurance Study (Detailed) Evacuation Route Map Critical Facilities Inventory Vulnerable Population Inventory Land Use Map	No           No           No           No           No           N/A           No           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements Studies/Reports/Maps Hazard Analysis/Risk Assessment (Local) Hazard Analysis/Risk Assessment (County) Flood Insurance Maps FEMA Flood Insurance Study (Detailed) Evacuation Route Map Critical Facilities Inventory Vulnerable Population Inventory Land Use Map Staff/Department	No         No         No         No         N/A         No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements Studies/Reports/Maps Hazard Analysis/Risk Assessment (Local) Hazard Analysis/Risk Assessment (County) Flood Insurance Maps FEMA Flood Insurance Study (Detailed) Evacuation Route Map Critical Facilities Inventory Vulnerable Population Inventory Land Use Map Staff/Department Public Godo Official	No           No           No           No           No           N/A           No           No
National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire 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 Aid Agreements Studies/Reports/Maps Hazard Analysis/Risk Assessment (Local) Hazard Analysis/Risk Assessment (County) Flood Insurance Maps FEMA Flood Insurance Study (Detailed) Evacuation Route Map Critical Facilities Inventory Vulnerable Population Inventory Land Use Map Staff/Department Building Code Official Dividing Insurance Action	No           No           No           No           No           N/A           No           No

Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	Yes
NEIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Yes KBRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy
American Red Cross	No
Salvation Army	No
Capability	Status Including Date of Document or Policy
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes, Full Time (County Chamber)
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	Status Including Date of Document or Policy
Ability to apply for Community Development Block	Yes
Grants	
Ability to fund projects through Capital Improvements	Yes
funding	
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
	†
Ability to incur debt through private activities	No

## 2.2.9 City of Sheldon

The City of Sheldon is located in the southwest part of Vernon County. According to the 2010 census the city's population is 542 people. The City of Sheldon has experienced a 2% increase in population since the 2000 census when they had a population of 531. The Mayor and Aldermen are the policy making bodies in the city government. The City of Sheldon has the following staff positions:

- City Clerk
- Public Works Official

Mitigation capabilities include:

- Uses County Emergency Operations Plan
- Volunteer Fire Department
- Emergency Management Coordinator
- Comprehensive Plan

- Building Code Ordinance
- Nuisance Ordinance

**Table 2.13** provides information on Sheldon's mitigation capabilities based on the Data

 Collection Questionnaire.

Table 2.13.	Sheldon Mitigation Capabilities
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Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Yes
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Operations Plan	No
County Emergency Operations Plan	Yes
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	No
County Mitigation Plan	Yes, 2013 County HMP
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	Yes, encompassed in KBRPC's regional plan
Transportation Plan	Yes, encompassed in KBRPC's regional plan
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	2013 County HMP
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	N/A
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	Yes
Building Code Ordinance	Yes
Floodplain Ordinance	No
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	No
NFIP Community Rating System (CRS) Participating	No
Community	
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	4
ISO Fire Rating	8
Economic Development Program	No
Land Use Program	Yes
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No

Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
(Local/County/Regional)	
Mutual Aid Agreements	No
Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	Yes
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	Status Including Date of Document or Policy
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	N/A
Sanitation Department	No
Iransportation Department	No
Economic Development Department	NO
Housing Department	NO
Planning Consultant	
Regional Planning Agencies	Yes, KBRPC
Non Covernmental Organizations (NCOs)	NU Status Including Data of Decument or Policy
American Red Cross	Status including Date of Document of Policy
Salvation Army	No
	Status Including Date of Document or Policy
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes, Full Time (County Chamber)
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	Status Including Date of Document or Policy
Ability to apply for Community Development Block	Yes
Grants	
Ability to fund projects through Capital Improvements	Yes
funding	
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	Yes
Ability to withhold spending in hazard prone areas	Yes

## 2.2.10 Village of Stotesbury

The Village of Stotesbury is located in the southeast part of Vernon County. According to the 2010

census the city's population is 18 people. The Village of Stotesbury has experienced a 58% decrease in population since the 2000 census when they had a population of 43. The Chairman and Board Trustees are the policy making bodies in the city government. The Village of Stotesbury has the following staff positions:

• Village Clerk

Mitigation capabilities include:

- Uses County Emergency Operations Plan
- Volunteer Fire Department

**Table 2.13** provides information on Stotesbury's mitigation capabilities based on the Data

 Collection Questionnaire.

Table 2.14.	Stotesbury	Mitigation	Capabilities
-------------	------------	------------	--------------

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Operations Plan	No
County Emergency Operations Plan	Yes, County HMP 2013
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Yes
Economic Development Plan	Yes, encompassed in KBRPC's regional plan
Transportation Plan	Yes, encompassed in KBRPC's regional plan
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	No
Building Code Ordinance	No
Floodplain Ordinance	No
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	No
NFIP Community Rating System (CRS) Participating	No
Community	

	No
National Weather Comice (NWO) Office Deside	
National Weather Service (NWS) Storm Ready	NO
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	N/A
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
(Local/County/Regional)	
Mutual Aid Agreements	No
Studies/Reports/Mans	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Mana	No
Flood insurance maps	NO
FEIVIA Flood Insurance Study (Detailed)	NO
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	Status Including Date of Document or Policy
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
	No
Development Planner	No
Public Works Official	No
Emorgonov Monogement Coordinator	No
	No
NFIP Floodplain Administrator	NO
Bomb and/or Arson Squad	NO
Emergency Response Team	NO
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Transportation Department Economic Development Department	No
Transportation Department Economic Development Department Housing Department	No No
Transportation Department Economic Development Department Housing Department Planning Consultant	No No No
Transportation Department Economic Development Department Housing Department Planning Consultant Regional Planning Agencies	No No No Yes, KBRPC
Transportation Department Economic Development Department Housing Department Planning Consultant Regional Planning Agencies Historic Preservation	No No No Yes, KBRPC No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)	No No No No Yes, KBRPC No Status Including Date of Document or Policy
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross	No           No           No           No           Yes, KBRPC           No           Status Including Date of Document or Policy           No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army	No           No           No           No           Yes, KBRPC           No           Status Including Date of Document or Policy           No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Canability	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veteraps Groups	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         No         Status Including Date of Document or Policy         No         No         No         No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organization	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         No         No         No         No         No         No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organization	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations	No No No No Yes, KBRPC No Status Including Date of Document or Policy No Status Including Date of Document or Policy No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         N
Transportation Department Economic Development Department Housing Department Planning Consultant Regional Planning Agencies Historic Preservation <b>Non-Governmental Organizations (NGOs)</b> American Red Cross Salvation Army <b>Capability</b> Veterans Groups Environmental Organization Homeowner Associations Neighborhood Associations Chamber of Commerce	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         Yes, Full Time (County Chamber)
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         N
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         No         Status Including Date of Document or Policy         No         No         No         No         No         No         Yes, Full Time (County Chamber)         No         Status Including Date of Document or Policy
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability         Ability to apply for Community Development Block Grants	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         No         No         No         No         No         No         No         Yes, Full Time (County Chamber)         No         Status Including Date of Document or Policy         Yes
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability         Ability to apply for Community Development Block         Grants         Ability to fund projects through Capital Improvements	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         Status Including Date of Document or Policy         No         No         No         No         Yes, Full Time (County Chamber)         No         Status Including Date of Document or Policy         Yes         No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability         Ability to apply for Community Development Block Grants         Ability to fund projects through Capital Improvements funding         Authority to levy taxes for a specific purpose	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         No         Status Including Date of Document or Policy         No         No         No         No         No         Status Including Date of Document or Policy         No         No         Status Including Date of Document or Policy         No         No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability         Ability to apply for Community Development Block Grants         Ability to fund projects through Capital Improvements funding         Authority to levy taxes for a specific purpose         Ease for water sewer cas or electric services	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         No         Status Including Date of Document or Policy         No         No         No         No         Status Including Date of Document or Policy         No
Transportation Department         Economic Development Department         Housing Department         Planning Consultant         Regional Planning Agencies         Historic Preservation         Non-Governmental Organizations (NGOs)         American Red Cross         Salvation Army         Capability         Veterans Groups         Environmental Organizations         Homeowner Associations         Neighborhood Associations         Chamber of Commerce         Community Organizations (Lions, Kiwanis, etc.         Local Funding Availability         Ability to apply for Community Development Block Grants         Ability to fund projects through Capital Improvements funding         Authority to levy taxes for a specific purpose         Fees for water, sewer, gas, or electric services         Impact fees for new development	No         No         No         No         Yes, KBRPC         No         Status Including Date of Document or Policy         No         No         Status Including Date of Document or Policy         No         No         No         No         Status Including Date of Document or Policy         No

Ability to incur debt through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Complete the following table to summarize the mitigation capabilities of the county and unincorporated cities. For each capability, indicate "yes" or "no". If relevant, enter the date of the most recent version.

### Table 2.15. Mitigation Capabilities Summary Table

CAPABILITIES	Uninc. Vernon	Bronaugh	Deerfield	Metz	Nevada	Richards	Schell City	Sheldon	Stotesbury	Walker
Planning Canabilities	County									
	NI-	NI-	NI-	NI-	V(== 0047	NI-	NI-	Maa	NI-	NI-
Comprehensive Plan	NO	NO	NO	NO	Yes, 2017	NO	NO	Yes	NO	NO
Builder's Plan	INO NI-	NO No	NO	INO No	N0	NO	NO	NO No	NO No	NO
Capital Improvement Plan	INO NI-	NO	NO	INO No	Yes, 2018	NO	NO	NO No	NO No	NO
Local Emergency Plan	INO	INO	NO Vac	INO Maa	Yes 2017	NO Vac 2017	NO Vac 2017	NO Vee	INO	Yes 2017
County Emergency Plan	res, 2017	res, 2017	2017	res, 2017	res, 2017	res, 2017	res, 2017	2017	res, 2017	res, 2017
Local Recovery Plan	No	No	No	No	No	No	No	No	No	No
County Recovery Plan	No	No	No	No	No	No	No	No	No	No
Local Mitigation Plan	No	No	No	No	No	No	No	No	No	No
County Mitigation Plan	Yes, 2019	Yes, 2019	Yes, 2019	Yes, 2019	Yes, 2019	Yes, 2019	Yes, 2019	Yes, 2019	Yes, 2019	Yes, 2019
Local Mitigation Plan (PDM)	No	No	No	No	No	No	No	No	No	No
County Mitigation Plan (PDM)	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Debris Management Plan	No	No	No	No	No	No	No	No	No	No
Economic Development Plan	Yes, 2018	Yes, 2018	Yes, 2018	Yes, 2018	Yes, 2018	Yes, 2018	Yes, 2018	Yes, 2018	Yes, 2018	Yes, 2018
Transportation Plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Land-use Plan	Yes, 2015	No	No	No	Yes, 2015	No	No	No	No	No
Flood Mitigation Assistance (FMA) Plan	Yes, 1992	Yes	No	No	Yes, 1998	Yes	No	No	No	No
Watershed Plan	No	No	No	Yes	Yes	No	No	No	No	No
Firewise or other fire mitigation plan	No	No	No	No	No	No	No	No	No	No
School Mitigation Plan	No	No	No	No	No	No	No	No	No	No
Critical Facilities Plan	No	No	No	No	No	No	No	No	No	No
(Mitigation/Response/Recovery)										
Policies/Ordinance										
Zoning Ordinance	No	No	No	No	Yes	No	No	Yes	No	No
Building Code	No	Yes	No	No	Yes, 2012	No	No	Yes, 2015	No	No
Floodplain Ordinance	1992	Yes, 2014	No	No	Yes, 1973	No	No	No	No	Yes
Subdivision Ordinance	No	No	No	No	Yes	No	No	No	No	No
Tree Trimming Ordinance	No	No	No	No	Yes	No	No	No	No	Yes

CAPABILITIES	Uninc. Vernon County	Bronaugh	Deerfield	Metz	Nevada	Richards	Schell City	Sheldon	Stotesbury	Walker
Nuisance Ordinance	No	No	No	No	Yes	No	Yes	Yes, 2006	No	Yes
Storm Water Ordinance	No	No	No	No	Yes	No	No	No	No	Yes
Drainage Ordinance	No	No	No	No	Yes	No	No	No	No	Yes
Site Plan Review Requirements	No	No	No	No	Yes	No	No	No	No	No
Historic Preservation Ordinance	No	No	No	No	No	No	No	No	No	No
Landscape Ordinance	No	No	No	No	No	No	No	No	No	No
Iowa Wetlands and Riparian Areas Conservation Plan	No	No	No	No	No	No	No	No	No	No
Program										
Zoning/Land Use Restrictions	No	Yes	No	No	Yes	No	No	No	No	Yes
Codes Building Site/Design	No	No	No	No	Yes	No	No	No	No	No
National Flood Insurance Program (NFIP) Participant	Yes	Yes	No	No	Yes	No	No	No	No	Yes
NFIP Community Rating System (CRS) Participating Community	Yes	Yes	No	No	Yes	No	No	No	No	Yes
Hazard Awareness Program	No	No	No	No	No	No	No	No	No	No
National Weather Service (NWS) Storm Ready	Yes, 2004	No	No	No	No	No	No	No	No	No
Building Code Effectiveness Grading (BCEGs)	No	No	No	No	5	No	No	4	No	No
ISO Fire Rating	N/A	7	N/A	N/A	3	N/A	8	8	N/A	6
Economic Development Program	No	No	No	No	Yes	No	No	No	No	No
Land Use Program	Yes	No	No	No	Yes	No	No	Yes	No	No
Public Education/Awareness	Yes	Yes	No	No	Yes	No	No	No	No	No
Property Acquisition	No	No	No	No	No	No	No	No	No	No
Planning/Zoning Boards	Yes	No	No	No	Yes	No	No	No	No	No
Stream Maintenance Program	No	No	No	No	No	No	No	No	No	No
Tree Trimming Program	No	Yes	No	No	No	No	No	No	No	Yes
Engineering Studies for Streams	No	No	No	No	No	No	No	No	No	No
Mutual Aid Agreements	No	No	No	No	No	No	Yes	No	No	Yes
Studios/Poports/Maps	110	110	110		140		103	110	110	105
	N1/A	Na	Nie	Na	N1/A	Ne	Na	Ne	Na	Na
Assessment (Local)	IN/A				IN/A					
Hazard Analysis/Risk Assessment (County)	No	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A

CAPABILITIES	Uninc. Vernon County	Bronaugh	Deerfield	Metz	Nevada	Richards	Schell City	Sheldon	Stotesbury	Walker
Flood Insurance Maps	Yes	No	No	No	No	No	No	No	No	No
FEMA Flood Insurance Study (Detailed)	No	No	No	No	No	No	No	No	No	No
Evacuation Route Map	No	No	No	No	No	Yes	No	No	No	No
Critical Facilities Inventory	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Vulnerable Population Inventory	No	No	No	No	No	No	No	No	No	No
Land Use Map	Yes	No	No	No	Yes	No	No	No	No	No
Staff/Department										
Building Code Official	No	No	No	No	Yes	No	No	No	No	No
Building Inspector	No	No	No	No	Yes	No	No	No	No	No
Mapping Specialist (GIS)	Yes	No	No	No	Yes	No	No	No	No	No
Engineer	No	No	No	No	Yes	No	No	No	No	No
Development Planner	No	No	No	No	No	No	No	No	No	No
Public Works Official	Yes	No	No	No	Yes	No	No	Yes	No	Yes
Emergency Management Coordinator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NFIP Floodplain Administrator	Yes	Yes	No	No	Yes	No	No	No	No	Yes
Bomb and/or Arson Squad	No	No	No	No	Yes, arson	No	No	No	No	No
Emergency Response Team	No	No	No	No	No	No	No	No	No	Yes
Hazardous Materials Expert	No	No	No	No	No	No	No	No	No	No
Local Emergency Planning Committee	Yes	No	No	No	Yes	No	No	No	No	No
County Emergency Management Commission	No	No	No	No	No	No	No	No	No	No
Sanitation Department	No	No	No	No	No	No	No	No	No	No
Transportation Department	No	No	No	No	Yes	No	No	No	No	No
Economic Development Department	No	No	No	No	Yes	No	No	No	No	No
Housing Department	No	No	No	No	Yes	No	No	No	No	No
Planning Consultant	No	No	No	No	No	No	No	No	No	No
Regional Planning Agencies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Historic Preservation	No	No	No	No	No	No	No	No	No	No
Non-Governmental Organizations (NGOs)										
American Red Cross	No	No	No	No	No	No	No	No	No	No
Salvation Army	No	No	No	No	No	No	No	No	No	No
Veterans Groups	Yes	No	No	No	Yes	No	No	No	No	Yes
Environmental Organization	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

CAPABILITIES	Uninc. Vernon County	Bronaugh	Deerfield	Metz	Nevada	Richards	Schell City	Sheldon	Stotesbury	Walker
Homeowner Associations	No	No	No	No	Yes	No	No	No	No	No
Neighborhood Associations	No	No	No	No	No	No	No	No	No	No
Chamber of Commerce	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes	Yes	No	No	Yes	No	No	Yes	No	No
Financial Resources										
Apply for Community Development Block Grants	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund projects through Capital Improvements funding	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes
Authority to levy taxes for specific purposes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes
Fees for water, sewer, gas, or electric services	No	Yes	No	No	Yes	No	Yes	Yes	No	Yes
Impact fees for new development	Yes	No	No	No	No	No	No	Yes	No	No
Incur debt through general obligation bonds	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes
Incur debt through special tax bonds	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes
Incur debt through private activities	Yes	No	No	No	No	No	Yes	Yes	No	No
Withhold spending in hazard prone areas	No	No	No	No	No	No	No	Yes	No	No

Source: Data Collection Questionnaires, 2017-2018

## 2.2.11 Sac Osage Electric Cooperative

Sac Osage Electric Cooperative provides electric services to nine counties who are primarily rural consumers. They have been serving member consumers in Cedar, St. Clair, Benton, Barton, Dade, Polk, Hickory, Henry and Vernon counties for over 65 years. Sac Osage Electric Cooperative currently provides electric service to approximately 8,500 members on a system that includes more than 2,300 miles of line and 10,000 meters. The Cooperative employs 38 full-time employees. Vernon County is located in District 5 service area.

## 2.2.12 Public School District Profiles and Mitigation Capabilities

This section provides general information about participating school districts in the plan. There are four school districts with facilities in Vernon County, only three participated in this plan. **Figure 2.4** is a map of the public schools in Vernon County.

Figure 2.4 Vernon County School Districts



Source: Missouri GIS Database

Table 2.16.	Vernon County	School Buildings and	Enroliment Data, 2017
-------------	---------------	----------------------	-----------------------

District Name	Building Name	Building Enrolment
Bronaugh R-VII School District	District	164
	Bronaugh Elementary	81
	Bronaugh High School	83
Nevada R-V School District	District	2,382
	Benton Elementary	177
	Bryan Elementary	343
	Heartland R-V School	0
	Nevada High School	720
	Nevada Middle School	581
	Truman Elementary School	561
Sheldon R-VIII School District	District	179
	Sheldon Elementary School	100
	Sheldon High School	79

http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx

## Table 2.17. Summary of Mitigation Capabilities-Vernon County School Districts

Capability	Bronaugh R-VII School District	Nevada R-V School District	Sheldon R-VIII School District	
Planning Elements				
Master Plan/ Date	Yes	Yes, 2018	Yes	
Capital Improvement Plan/Date	No	Yes, 2018	No	
School Emergency Plan / Date	Yes	Yes, 2017	Yes	
Weapons Policy/Date	Yes	Yes, 2017	Yes	
Personnel Resources				
Full-Time Building Official (Principal)	Yes	Yes, Superintendent	Yes, Superintendent, Principal	
Emergency Manager	Yes, Superintendent	Yes, Assistant Superintendent	Yes, Superintendent	
Grant Writer	No	No	No	
Public Information Officer	Yes, Superintendent	No	Yes, Superintendent	
Financial Resources				
Capital Improvements Project Funding	Yes	Yes	Yes	
Local Funds	Yes	Yes	Yes	
General Obligation Bonds	No	Yes	No	
Special Tax Bonds	No	No	No	
Private Activities/Donations	Yes	Yes	Yes	
State and Federal Funds/Grants	Yes	Yes	Yes	
Other				
Public Education Programs	Yes	Yes	Yes	

Capability	Bronaugh R-VII School District	Nevada R-V School District	Sheldon R-VIII School District
Privately or Self-Insured?	Yes	Yes	Yes
Fire Evacuation Training Yes		Yes	Yes
Tornado Sheltering Exercises	Yes	Yes	Yes
Public Address/Emergency Alert System	Yes	Yes	Yes
NOAA Weather Radios	Yes	Yes	Yes
Lock-Down Security Training	Yes	Yes	Yes
Mitigation Programs	Yes	Yes	Yes
Tornado Shelter/Saferoom	No	No	No
Campus Police	No	Yes	No

Data Collection Questionnaires, 2017

# RISK ASSESSMENT

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

The goal of the risk assessment is to estimate the potential loss in Vernon County, including loss of life, personal injury, property damage, and economic loss, from a hazard event. The risk assessment process allows communities and school/special districts in Vernon County to better understand their potential risk to the identified hazards. It will provide a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This is an update of the previous Vernon County Hazard Mitigation Plan adopted in 2013. According to the U.S. Census Bureau, the Vernon County population has declined to 20,554 from the July 1, 2016 population estimate compared to the April 1, 2010 population estimate of 21,146. The population of Vernon County has decreased approximately by 287 people since the Plan was adopted in 2013. The 2017 ACS estimate provides that 9,583 total housing units exist in

the county, an increase of 41 units since the 2010 decennial census. Vernon County is experiencing moderate growth when compared to other counties in the region.

Vernon County is a class three county in Missouri. According to the Missouri Revised Statues (MORS 48.020 "All counties of this state are hereby classified, for the purpose of establishing organization and powers in accordance with the provisions of section 8, article VI, Constitution of Missouri, into four classifications determined as follows:

Classification 1. All counties having an assessed valuation of nine hundred million dollars and over shall automatically be in the first classification after that county has maintained such valuation for the time period required by section 48.030; however, any county of the second classification which, on August 28, 2010, has had an assessed valuation of at least six hundred million dollars for at least one year may, by resolution of the governing body of the county, elect to be classified as a county of the first classification after it has maintained such valuation for the period of time required by the provisions of section 48.030.

Classification 2. All counties having an assessed valuation of six hundred million dollars and less than the assessed valuation necessary for that county to be in the first classification shall automatically be in the second classification after that county has maintained such valuation for the time period required by section 48.030.

Classification 3. All counties having an assessed valuation of less than the assessed valuation necessary for that county to be in the second classification shall automatically be in the third classification.

Classification 4. All counties which have attained the second classification prior to August 13, 1988, and which would otherwise return to the third classification after August 13, 1988, because of changes in assessed valuation shall remain a county in the second classification

and shall operate under the laws of this state applying to the second classification. The required assessed valuation for each classification under subsection 1 of this section shall be increased annually by an amount equal to the percentage change in the annual average of the Consumer Price Index for All Urban Consumers (CPI-U) or zero, whichever is greater. The state tax commission shall calculate and publish this amount so that it is available to all counties."

This chapter is divided into four main parts:

- Section 3.1 Hazard Identification identifies the hazards that threaten Vernon County and provides a factual basis for elimination of hazards from further consideration;
- Section 3.2 Assets at Risk provides Vernon County's total exposure to natural hazards, considering critical facilities and other community assets at risk;
- Section 3.3 Future Land Use and Development discusses areas of planned future development
- Section 3.4 Hazard Profiles and Vulnerability Analysis provides more detailed information about the hazards impacting Vernon County. For each hazard, there are three sections: 1) <u>Hazard Profile</u> provides a general description and discusses the threat to Vernon County, the geographic location at risk, potential severity/magnitude/extent, previous occurrences of hazard events, probability of future occurrence, risk summary by jurisdiction, impact of future development on the risk; 2) <u>Vulnerability Assessment</u> further defines and quantifies populations, buildings, critical facilities, and other community/school or special district assets at risk to natural hazards; and 3) <u>Problem Statement</u> briefly summarizes the problem and develops possible solutions.

# 3.1 Hazard Identification

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

The Plan profiles all natural hazards that can affect Vernon County. The natural hazards that can affect the county have been identified in the 2013 Vernon County Multi-Jurisdictional Hazard Mitigation Plan and the 2013 Missouri State Plan. Natural hazards are naturally occurring climatological, hydrological or geologic events that have a negative effect on people and the built environment. Natural hazards identified include:

- Dam Failure
- Drought
- Earthquake
- Extreme Heat
- Flood (includes river flooding, flash flooding, and storm water flooding)
- Levee Failure
- Wildfire
- Land Subsidence/Sinkholes
- Severe Thunderstorm (Lightning, Hail, and High Winds)

- Tornado
- Severe Winter Weather (Snow, Ice, and Severe Cold)

No new natural hazards have been identified since the adoption of the previous plan. The 2013 Missouri State Plan also addresses human-caused, and technological hazards; however, these will not be included in this plan update.

# 3.1.1 Review of Existing Mitigation Plans

The MPC reviewed the hazards identified in the previously approved plan, as well as the hazards identified in the state plan during the meeting(s) held on November 30, 2017. The hazards identified in the Vernon County Plan are identified in the 2013 Missouri State Plan. The State Plan also includes structural and urban fire in addition to wildfire. Human-caused and technological hazards identified in the State Plan include:

- CBRNE Attack
- Civil Disorder
- Cyber Disruption
- Hazardous Materials
- Mass Transportation Accidents
- Nuclear Power Plants
- Public Health Emergencies/Environmental Issues
- Special Events
- Terrorism
- Utility Interruptions and System Failures

In Missouri, local plans customarily include only natural hazards, as only natural hazards are required by federal regulations to be included. It was determined to include only natural hazards. The MPC agreed that human-caused and technological hazards are addressed in a Regional Homeland Security Oversight Committee (RHSOC) Threat and Hazard Identification Risk Assessment (THIRA) and that including only natural hazards would meet the needs of local entities participating in the plan update.

Due to its location in Middle-America, the MPC did not include the following natural hazards in this analysis: avalanches, coastal erosion, coastal storms, hurricanes, tsunamis and volcanoes. These are not included because they historically have not threatened Missouri. According to the 2013 Missouri State Hazard Mitigation Plan, Hurricane Ike did indirectly cause severe weather in the state, it was the resulting hazards (flooding, winds, hail and tornadoes) that directly affected Missouri. While expansive soils, landslides and rock falls are recognized as hazards in Missouri, they occur infrequently and their impacts are minimal; so they will not be profiled further in this Plan.

# 3.1.2 Review Disaster Declaration History

Federal and/or State Disaster Declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is so severe that both the local and state governments' capacities are exceeded; a federal emergency or

disaster declaration may be issued allowing for the provision of federal assistance.

FEMA also issues emergency declarations, which are more limited in scope and do not include the longterm federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected.

From 1965 to present Vernon County has experienced severe storms, flooding, tornadoes, ice storms, drought, straight-line winds, heavy rain and severe winter storms. All of these natural hazard events triggered federal disaster declarations. Federal and/or state declarations may be granted when the severity and the magnitude of an event surpasses the ability of the local government's capacity to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is severe enough that both the local and state government's capacity has been surpassed, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

Since 1976 Vernon County has experienced nineteen (19) hazard events that triggered federal disaster declarations. The most recent was declared on January 2, 2016. Out of those 19 events, 12 declarations included flooding, 11 declarations included severe storms, 1 included a drought, 1 included a hurricane, and 3 declarations included severe ice storms. Of these declarations, 18 triggered individual and/or public assistance. For more information on FEMA declarations please visit <a href="https://www.fema.gov/data-visualization-summary-disaster-declarations-and-grants">https://www.fema.gov/data-visualization-summary-disaster-declarations-and-grants</a> for an Excel file "Summary of Disaster Declarations and Grants" and go to the tab named "FEMA Declarations".

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)		
1023	Severe Storms, Tornadoes, Flooding	1994	IA		
1054	Severe Storms, Tornadoes, Hail, Flooding	1995	IA, PA		
1412	Severe Storms, Tornadoes, Flooding	2002	PA, IA		
1463	Severe Storms, Tornadoes, Flooding	2003	IA, PA		
1524	Severe Storms, Tornadoes, Flooding	2004	IA		
1631	Severe Storms, Tornadoes, Flooding	2006	IA, PA		
1749	Severe Storms and Flooding	2008	IA,PA		
1773	Severe Storms and Flooding	2008	IA, PA		
1847	Severe Storms, Tornadoes, Flooding	2009	IA, PA		
3317	Severe Winter Storm	2011	PA		
1961	Severe Winter Storm and Snowstorm	2011	PA		
779	Severe Storms and Flooding	1986	IA, PA		
995	Severe Storms and Flooding	1993	PA, IA		

Table 3.1 lists the federal FEMA disaster declarations that included Vernon County from 1965 to present.

Table 3.1.	FEMA Disaster Decla	rations that included V	ernon County,	MO 1965-Present
------------	---------------------	-------------------------	---------------	-----------------

3374	Severe Storms, Tornadoes, Straight- line winds, and Flooding	2016	PA						
1403	Severe Winter Ice Storm	2002	PA, IA						
3281	Severe Winter Storms	2007	PA						
3303	Severe Winter Storm	2009	PA						
3017	Drought	1976	PA						
3232	Hurricane Katrina Evacuation	2005	PA						
ource: Federal Emergency Management Agency, https://www.fema.gov/data-visualization-summary-disaster-declarations-and-grants									

# 3.1.3 Research Additional Sources

There are a variety of sources researched for data on natural hazards. Primary sources included FEMA, SEMA, National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration (NOAA). The U.S. Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) were major sources for earthquake information. The Missouri Department of Natural Resources (MDNR) Dam Safety Division provided information concerning dams and the Missouri Department of Conservation (MDC). Other information sources included county officials; existing city, county, regional and state plans; and information from local officials. The additional sources of data on locations and past impacts of hazards in Vernon County include:

- Missouri Hazard Mitigation Plans (2010 and 2013)
- Previously approved Vernon County Hazard Mitigation Plan (2013)
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources (MDNR)
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
- National Agricultural Statistics Service (Agriculture production/losses)
- Data Collection Questionnaires completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (HAZUS)
- Missouri Department of Transportation
- Missouri Division of Fire Marshal Safety
- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI);
- Pipeline and Hazardous Materials Safety Administration
- County and local Comprehensive Plans to the extent available
- County Emergency Management
- County Flood Insurance Rate Map, FEMA

- Flood Insurance Study, FEMA
- SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin
- U.S. Army Corps of Engineers
- U.S. Department of Transportation
- United States Geological Survey (USGS)
- Various articles and publications available on the internet, citations to the sources are provided in the body of the plan.

The only centralized source of data for many of the weather-related hazards is the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI). Although it is usually the best and most current source, there are limitations to the data which should be noted. The NCEI documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. In addition, it is a partial record of other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. Some information appearing in the NCEI may be provided by or gathered from sources outside the National Weather Service (NWS), such as the media, law enforcement and/or other government agencies, private companies, individuals, etc. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS. Those using information from NCEI should be cautious as the NWS does not guarantee the accuracy or validity of the information.

The NCEI damage amounts are estimates received from a variety of sources, including those listed above in the Data Sources section. For damage amounts, the NWS makes a best guess using all available data at the time of the publication. Property and crop damage figures should be considered as a broad estimate. Damages reported are in dollar values as they existed at the time of the storm event. They do not represent current dollar values.

The database currently contains data from January 1950 to March 2014, as entered by the NWS. Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. The following timelines show the different time spans for each period of unique data collection and processing procedures.

1. Tornado: From 1950 through 1954, only tornado events were recorded.

2. Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.

3. All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

It should be noted that injuries and deaths caused by a storm event are reported on an area-wide basis. When reviewing a table resulting from an NCEI search by county, the death or injury listed in connection with that county search did not necessarily occur in that county.

# 3.1.4 Hazards Identified

The natural hazards that can possibly, or have affected Vernon County, are profiled in alphabetical order. All hazards do not affect every jurisdiction participating in the Plan. Table 3.2 provides a summary of the jurisdictions that may be affected by each hazard. An "X" in the table indicates that jurisdictions are affected by the hazard, and " " indicates the hazard is not applicable to that jurisdiction. As Vernon County is a predominately rural, limited variations occur across the county. However, jurisdictions with a high percentage of housing comprised of mobile homes, for example, could be more at risk to damages from a tornado. **Table 3.2** depicts a summary of natural hazard profiles and severity ratings by participating jurisdictions.

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Heat	Wildfires	Flooding (River and Flash)	Land Subsidence/Sinkholes	Levee Failure	Severe Winter Weather/Snow/Ice/ Severe Cold	Thunderstorm/Lightning/Hail/ High Wind	Tornado
Vernon County	Х	Х	Х	Х	Х	Х	Х		Х	Х	Х
City of Bronaugh	Х	Х	Х	Х	Х	Х	Х		Х	Х	Х
Village of Deerfield		Х	Х	Х	Х	Х	Х		Х	Х	Х
Village of Metz		Х	Х	Х	Х	Х	Х		Х	Х	Х
City of Nevada	Х	Х	Х	Х	Х	Х	Х		Х	Х	Х
City of Richards		Х	Х	Х	Х	Х	Х		Х	Х	Х
City of Schell City		Х	Х	Х	Х	Х	Х		Х	Х	Х
City of Sheldon		Х	Х	Х	Х	Х	Х		Х	Х	х
Village of Stotesbury		Х	Х	Х	Х	Х	Х		Х	Х	Х
City of Walker		Х	Х	Х	Х	Х	Х		Х	Х	Х
Bronaugh R-VII School District	Х	Х	Х	Х	Х	Х	Х		Х	Х	Х
Sheldon R-VIII School District		Х	Х	X	X	X	Х		Х	Х	Х
Nevada R-V School District	Х	Х	Х	Х	Х	Х	Х		Х	Х	Х
Sac Osage Electric Cooperative	Х	Х	Х	Х	Х	Х	Х		Х	Х	Х

 Table 3.2.
 Hazards Identified for Each Jurisdiction

# 3.1.5 Multi-Jurisdictional Risk Assessment

The risk assessment assesses each participating jurisdiction's vulnerability to each hazard that can affect Vernon County. Many of the hazards that are identified in this plan have the same probability of occurrence across Vernon County. Although, there are a few hazards that vary across Vernon County in terms of risk. Those hazards are as follows: dam failure, flooding, land subsidence/sinkholes, and wildfires. Levee failures are not considered a hazard for the Vernon County planning area. These differences are detailed in each hazard profile under the geographic location and vulnerability.

Vernon County's climate is mostly uniform. The City of Nevada is considered to be the most urbanized at 97% urban and 3% rural. Vernon County is considered to be 42% urban and 58% rural. While the City of Bronaugh, Village of Deerfield, City of Richards, City of Schell City, City of Sheldon, Village of Stotesbury, and the City of Walker are all considered to be 100% rural according to <u>www.city-data.com</u>. Naturally the urbanized areas of Vernon County have a greater density of important assets, which are more vulnerable to weather related hazards. With growth and expansion in each jurisdiction in Vernon County this increases the vulnerability to natural hazards.

The rural areas of Vernon County are vulnerable to all hazards but especially hail damages and drought. This is the agricultural area of Vernon County and presents more of a risk for crop failure.

These capabilities and resources to mitigate the impact of natural hazards vary across jurisdictions in Vernon County. These differences will be discussed in greater detail in the vulnerability sections of each hazard.

# 3.2 Assets at Risk

This section assesses Vernon County population, structures, critical facilities and infrastructure, and other important assets that may be at risk to hazards. The inventory of assets for each jurisdiction were derived from parcel data from the Vernon County Assessor, local jurisdiction data questionnaires, datasets downloaded from Missouri Spatial Data Information Service (MSDIS) and the Missouri GIS Database.

# 3.2.1 Total Exposure of Population and Structures

# Unincorporated County and Incorporated Cities

In the following three tables, population data is based on 2012-2016 American Community Survey 5year estimates. Building counts, structure data and building exposure values are based on parcel data provided by Vernon County Assessor.

Contents exposure values are calculated below in **Table 3.3.** It should be noted that the total valuation of buildings is based on County Assessor's data which may not be current. In addition, government owned properties are usually taxed differently or not at all, and may not be an accurate representation of true value. Note that the public school districts assets are included in the total

exposure tables assets by community and county.

**Table 3.3** shows the total population, building count, estimated value of buildings, estimated value of contents and estimated total exposure to parcels for the unincorporated Vernon County and each incorporated city. **Table 3.4** that follows provides the building value exposures for the county and each city in Vernon County broken down by usage type. Finally, **Table 3.5** provides the building count total for Vernon County and each city in Vernon County area broken out by building usage types (residential, commercial, industrial, and agricultural).

Jurisdiction	2010 Population	Building Count	Building Exposure (\$)	Contents Exposure (\$)	Total Exposure (\$)
Vernon County	21,159	12,653	\$617,452,214	\$354,653,559	\$5,001,953,351
City of Bronaugh	249	64	\$7,557,957	\$4,638,687	\$12,353,951
Village of Deerfield	81	24	\$3,209,152	\$2,440,008	\$5,649,160
Village of Metz	49	74	\$6,042,679	\$3,735,247	\$9,777,925
City of Nevada	8,381	3,361	\$623,590,861	\$849,346	\$1,033,205,843
City of Richards	97	87	\$8,037,448	\$4,037,899	\$12,075,347
City of Schell City	249	179	\$24,273,403	\$15,557,506	\$41,575,371
City of Sheldon	543	152	\$21,841,837	\$16,424,604	\$40,848,307
Village of Stotesbury	18	19	\$1,853,616	\$930,643	\$2,784,259
City of Walker	270	147	\$25,009,094	\$13,634,726	\$36,422,266
Totals	31,096	16,760	\$1,338,868,261	\$416,902,225	\$6,196,645,780

Table 3.3.	Maximum Po	pulation and	<b>Building Ex</b>	posure by	Jurisdiction-
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Sources: Population, 2010 U.S. Census; Building Count and Building Exposure, Missouri GIS, Data Collection Questionnaire and Vernon County Assessor.

#### Table 3.4. Building Values/Exposure by Usage Type

Jurisdiction	Residential	Commercial	Agricultural	Total
Vernon County	\$585,472,465	\$22,438,324	\$9,541,425	\$617,452,214
City of Bronaugh	\$6,153,153	\$1,385,082	\$19,723	\$7,557,957
Village of Deerfield	\$1,538,288	\$1,662,098	\$8,766	\$3,209,152
Village of Metz	\$4,614,864	\$1,385,082	\$42,733	\$6,042,679
City of Nevada	\$427,951,760	\$117,177,917	\$72,317	\$623,590,861
City of Richards	\$7,999,098	\$0	\$38,350	\$8,037,448
City of Schell City	\$20,920,719	\$3,324,196	\$28,488	\$24,273,403
City of Sheldon	\$15,998,197	\$5,817,343	\$26,297	\$21,841,837
Village of Stotesbury	\$1,845,946	\$0	\$7,670	\$1,853,616
City of Walker	\$18,305,629	\$6,691,412	\$12,053	\$25,009,094
Bronaugh School District	Not Provided	\$6,627,588	Not Provided	\$6,627,588
Nevada School District	Not Provided	\$57,205,370	Not Provided	\$57,205,370
Sheldon School District	Not provided	Not provided	Not provided	Not provided
Totals	\$1,090,800,118	\$222,329,330	\$9,797,820	\$1,402,701,219

Source: Missouri GIS Database, County Assessor Data

Jurisdiction	Residential Counts	Commercial Counts	Agricultural Counts	Total
Vernon County	3,806	81	8,708	12,595
City of Bronaugh	40	5	18	63
Village of Deerfield	10	6	8	24
City of Nevada	2,782	423	66	3,271
Village of Metz	30	5	39	74
City of Richards	52	0	35	87
City of Schell City	136	12	26	174
City of Sheldon	104	21	24	149
Village of Stotesbury	12	0	7	19
City of Walker	119	15	11	145
Totals	7,091	568	8,942	16,601

Table 3.5. Building Counts by Usage Type

Source: Missouri GIS Database, Vernon County Assessor Data.

Even though schools and special districts' total assets are included in the tables above, additional discussion is needed, based on the data that is available from the districts' completion of the Data Collection Questionnaire and district maintained websites. The number of enrolled students at the participating public school districts is provided in **Table 3.6** below. Additional information includes the number of buildings, building values (building exposure) and contents value (contents exposure). These numbers will represent the total enrollment and building count for the public school districts regardless of the county in which they are located.

#### Table 3.6. Population and Building Exposure by Jurisdiction-Public School Districts

Public School District	Enrollment	Building Count	Building Exposure	Contents Exposure (\$)	Total Exposure (\$)
Bronaugh School District	164		\$6,627,588		\$6,627,588
Nevada R-V School District	2,382	17	\$57,205,370.00	\$5,952,463.00	\$63,157,833.00
Sheldon R-VIII School District	179	3	\$8,416,257	\$852,627	\$9,268,884

Source: http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx., select the file for the most recent year called "20xx Building Enrollment PK-12", filter the spreadsheet by selecting only the public school districts in the planning area. The Building Exposure, Contents Exposure, and Total Exposure amounts come from the completed Data Collection Questionnaires from Public School Districts. In general, the school districts obtain this information from their insurance coverage amounts.

# 3.2.2 Critical and Essential Facilities and Infrastructure

This section will include information from the Data Collection Questionnaire and other sources concerning the vulnerability of participating jurisdictions' critical, essential, high potential loss, and transportation/lifeline facilities to identified hazards. Definitions of each of these types of facilities are provided below.

- Critical Facility: Those facilities essential in providing utility or direction either during the response to an emergency or during the recovery operation.
- Essential Facility: Those facilities that if damaged, would have devastating impacts on disaster response and/or recovery.
- High Potential Loss Facilities: Those facilities that would have a high loss or impact on the community.
- Transportation and lifeline facilities: Those facilities and infrastructure critical to

transportation, communications, and necessary utilities.

**Table 3.7** includes a summary of the inventory of critical and essential facilities and infrastructure in the planning area. The list was compiled from the Data Collection Questionnaire as well as the following sources:

• 2015 Vernon County Disaster Related Land Use Plan

Jurisdiction	Airport Facility	Bus Facility	Childcare Facility	Communications Tower	Electric Power Facility	Emergency Operations	Fire Service	Government	Housing	Shelters	Highway Bridge	Hospital/Health Care	Military	Natural Gas Facility	Nursing Homes	Police Station	Potable Water Facility	Rail	Sanitary Pump Stations	School Facilities	Storm water Pump Stations	Tier II Chemical Facility	Wastewater Facility	Total
Vernon County	0	0	0	3	0	1	3	0	0	2	121	0	0	0	0	0	0	1	0	0	0	0	0	131
City of Bronaugh	0	0	0	0	0	1	1	1	0	2	0	0	0	0	0	0	0	0	1	1	1	0	1	9
Village of Deerfield	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	5
City of Nevada	2	0	4	12	1	2	2	1	0	5	5	2	2	1	1	2	0	1	1	8	1	0	1	54
Village of Metz	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
City of Richards	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
City of Schell City	0	0	0	1	0	2	1	1	0	2	0	0	0	0	0	1	0	1	0	1	0	0	0	10
City of Sheldon	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	1	0	2	0	0	1	10
Village of Stotesbury	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
City of Walker	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	1	8
Totals	2	0	4	17	2	10	10	7	0	13	126	2	2	1	1	4	0	6	3	13	2	0	5	229

### Table 3.7. Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

Source: Data Collection Questionnaires; 2015 Vernon County Disaster Related Land Use Plan

**Figure 3.1** is a map that shows the locations of bridges in Vernon County included in the National Bridge Inventory data set that are structurally deficient. This data was extracted from the National Bridge Inventory.



### Figure 3.1.Vernon County Bridges and Structurally Deficient Bridges

Source: National Bridge Inventory

# 3.2.3 Other Assets

Assessing the vulnerability of Vernon County to disaster also requires data on the natural, historic, cultural, and economic assets of the area. This information is important for many reasons.

- These types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- Knowing about these resources in advance allows for consideration immediately following a hazard event, which is when the potential for damages is higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- The presence of natural resources can reduce the impacts of future natural hazards, such as wetlands and riparian habitats which help absorb floodwaters.
- Losses to economic assets like these (e.g., major employers or primary economic sectors) could have severe impacts on a community and its ability to recover from disaster.

<u>Threatened and Endangered Species</u>: **Table 3.8** shows Federally Threatened, Endangered, Proposed and Candidate Species in the county.

Common Name	Scientific Name	Status
Pink Mucket	Pearlymussel or Lampsilis abrupta	Endangered
Spectaclecase	Mussel or Cumberlandia Monodonta	Endangered
Niangua Darter	Etheostoma Nianguae	Threatened
Mead's Milkweed	Asclepias Meadii	Threatened
No Common Name	Geocarpon Minimum	Threatened
Running Buffalo Clover	Trifolium Stoloniferum	Endangered
Indiana Bat	Myotis Sodalis	Endangered
Gray Bat	Myotis Grisescens	Endangered
Northern Long-Eared Bat	Myotis Septentrionalis	Threatened

#### Table 3.8. Threatened and Endangered Species in Vernon County

Source: U.S. Fish and Wildlife Service, https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=29039

<u>Natural Resources</u>: The Missouri Department of Conservation (MDC) provides a database of lands the MDC owns, leases, or manages for public use. **Table 3.9** to provide the names and locations of parks and conservation areas in Vernon County.

#### Table 3.9. Parks in Vernon County

Parks/Conservations Areas	Address	City
Balltown Access	Richards, MO 64778	Richards, Missouri
Big Drywood Creek Conservation Area	Nevada, MO 64772	Nevada, Missouri
Bristow Conservation Area	Nevada, MO 64772	Nevada, Missouri
Bushwhacker Lake Conservation Area	Sheldon, MO 64784	Sheldon, Missouri
Cephas Ford Access	Richards, MO 64778	Richards, Missouri
Clear Creek Conservation Area	Sheldon, MO 64784	Sheldon, Missouri
Douglas Branch Conservation Area	Richards, MO 64778	Richards, Missouri
Flight Lake Conservation Area	Richards, MO 64778	Richards, Missouri
Four Rivers Conservation Area	E Ball Rd, Rich Hill, MO 64779	Rich Hill, Missouri

Gama Grass Prairie Conservation Area	Rich Hill, MO 64779	Rich Hill, Missouri
Gay Feather Prairie Conservation Area	Montevallo, MO 64784	Montevallo, Missouri
Little Osage Prairie	Nevada, MO 64772	Nevada, Missouri
McGenis Youth Center Lake	3181 S State Highway WW, Rich Hill, MO 64779	Rich Hill, Missouri
Izaac Walton Lake	Nevada, MO 64772	Nevada, Missouri
Radio Springs Lake	1100 S College St, Nevada, MO 64772	Nevada, Missouri
Osage Prairie Conservation Area	Nevada, MO	Nevada, Missouri
Schell Osage Conservation Area	4662 2950 Rd, Schell City, MO 64783	Schell City, Missouri

<u>Historic Resources</u>: The National Register of Historic Places is the official list of registered cultural resources worthy of preservation. It was authorized under the National Historic Preservation Act of 1966 as part of a national program. The purpose of the program is to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. The National Register is administered by the National Park Service under the Secretary of the Interior. Properties listed in the National Register include districts, sites, buildings, structures and objects that are significant in American history, architecture, archeology, engineering, and culture.

Properties in Vernon County that are on the National Register of Historic Places are listed in **Table 3.10**.

Table 3.10.	Vernon Count	y Properties of	on the National	Register	of Historic Places
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Property	Address	City	Date Listed
Brown Archaeological Site	Address restricted		2/12/71
Carrington Osage Village Archaeological Site	Address restricted		10/15/66
Coal Pit Archaeological Site	Address restricted		2/12/71
Halley's Bluff Site	Address restricted		7/24/74
Infirmary Building, MO State Hospital #3	2095 N Ash St.	Nevada	11/25/05
Prairie View Stock Farm	County Rd. WW	Rich Hill	9/8/15
Vernon County Courthouse	Bounded by Cherry, Cedar, Walnut, Main St.	Nevada	6/27/97
Vernon County Jail, Sheriff's House & Office	229 N Main St.	Nevada	8/16/77

Source: Missouri Department of natural Resources – Missouri National Register Listings by County http://dnr.mo.gov/shpo/mnrlist.htm

Economic Resources: **Table 3.11** shows major non-government employers in Vernon County.

Employer Name	Main Locations	Product or Service	Employees
3M	2120 E Austin, Nevada	Adhesiv	650
Nevada Regional Medical Center	800 S Main, Nevada	Medical	475
US Bank	200 W Cherry, Nevada	Banking	125
Walmart	2250 E Lincoln	Retail	271
ADM	17700 South T Highway, Deerfield	Agriculture	52
Smithfield	3101 Industrial Parkway, Nevada	Food	297
American Standard	1800 US-71, Nevada	Manufacturing	146

Source: Data Collection Questionnaires

Agriculture Table 3.12 provides a summary of the agriculture in Vernon County.

#### Table 3.12. Agriculture in Vernon County

Category	2007	2012	Percent Change
Number of Farms	1,383	1,356	-2
Land in Farms	455,844 acres	418,614 acres	-8
Average Size of Farms	330	309	-6
Market Value of Products Sol	d		
Crop Sales	N/A	\$62,212,000	N/A
Livestock Sales	N/A	\$146,785,000	N/A
Total	\$129,353,000	\$208,997,000	+62
Average Per Farm	\$4,692,000	\$4,561,000	-3
Government Payments	\$7,885	\$7,501	-5

Source: https://www.agcensus.usda.gov/Publications/2012/Online\_Resources/County\_Profiles/Missouri/cp29039.pdf

# 3.3 Land Use and Development

# 3.3.1 Development Since Previous Plan Update

Vernon County has experienced a slight growth since 2000, with an increase of 3.4% from 2000 to 2010 according to the U.S Census. **Table 3.13** provides the population growth statistics for all cities and villages in Vernon County as well as the county as a whole.

Jurisdiction	Total Population 2010	Total population 2000	2000-2010 # Change	2000-2010 % Change	
Vernon County	21,159	20,454	705	3.4%	
Bronaugh	249	246	3	1.2%	
Deerfield	81	75	6	8%	
Metz	49	69	-20	-29%	
Nevada	8,385	8,633	-248	-2.9%	
Richards	97	95	2	2.1%	
Schell City	249	285	-36	-12.6%	
Sheldon	543	531	12	2.3%	
Stotesbury	18	43	-25	-58.1%	
Walker	270	274	-4	-1.5%	

#### Table 3.13. County Population Growth, 2000-2010

Source: U.S. Bureau of the Census, Decennial Census; Population Statistics are for entire incorporated areas as reported by the Census bureau

Population growth or decline is generally accompanied by increases or decreases in the number of housing units. **Table 3.14** provides the change in numbers of housing units in Vernon County from 2000 to 2010.

Jurisdiction	Housing Units 2010	Housing Units 2000	2000-2010 # Change	2000-2010 % Change
Vernon County	9,583	8,872	711	8%
Bronaugh	75	103	-28	-27%
Deerfield	32	38	-6	-16%
Metz	22	36	-14	-38%
Nevada	3,876	3,857	19	0.49%
Richards	35	42	-7	-16%
Schell City	197	161	36	22%
Sheldon	358	232	126	54%
Stotesbury	7	15	-8	-53%
Walker	113	125	-12	-9%

### Table 3.14. Change in Housing Units, 2000-2010

Source: U.S. Bureau of the Census, Decennial Census; Population Statistics are for entire incorporated areas as reported by the U.S. Census Bureau

Changes in development in Vernon County include an increase in housing units, residential units, and commercial and agricultural buildings. Newer residences and commercial buildings have higher value which would result in a greater loss should hazards occur.

# 3.3.2 Future Land Use and Development

**Vernon County (unincorporated)**-Development continues to increase throughout the county and that shows in the population increase and housing units' increase. Trends show that citizens are moving outside city limits into the county.

*City of Bronaugh*-The City of Bronaugh has seen a significant decrease in population and growth.

Village of Deerfield-The Village of Deerfield has seen a decrease in growth.

Village of Metz-The Village of Metz has seen a decrease in growth.

*City of Nevada*-All though there is a slight decrease in population since the last plan update, development continues to increase though out the City.

*City of Richards*-The City of Richards has seen a small growth since the last plan was written.

*City of Schell City*-Although the City of Schell City has experienced a population decline; commercial growth has seen an increase.

*City of Sheldon*-The City of Sheldon has shown increases in the service industry and commercial growth.

Village of Stotesbury-The Village of Stotesbury has seen significant decline in growth.

City of Walker-The City of Walker continues to grow.

#### **School District's Future Development**

Future development trends for the participating school districts include updating the buildings and facilities and the building of a new Saferoom/gymnasium has been discussed at Sheldon R-VIII.

# 3.4 Hazard Profiles, Vulnerability, and Problem Statements

Each hazard will be analyzed individually in a hazard profile. The profile will consist of a general hazard description, location, severity/magnitude/extent, previous events, future probability, a discussion of risk variations between jurisdictions, and how anticipated development could impact risk. At the end of each hazard profile will be a vulnerability assessment, followed by a summary problem statement.

### Hazard Profiles

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

The level of information presented in the profiles will vary by hazard based on the information available. With each update of this plan, new information will be incorporated to provide better evaluation and prioritization of the hazards that affect Vernon County. Detailed profiles for each of the identified hazards include information categorized as follows:

**Hazard Description:** This section consists of a general description of the hazard and the types of impacts it may have on a community or school/special district.

**Geographic Location:** This section describes the geographic location of the hazard in Vernon County. Where available, use maps to indicate the specific locations of Vernon County that are vulnerable to the subject hazard. For some hazards, the entire planning area is at risk.

**Severity/Magnitude/Extent:** This includes information about the severity, magnitude, and extent of a hazard. For some hazards, this is accomplished with description of a value on an established scientific scale or measurement system, such as an EF2 tornado on the Enhanced Fujita Scale. Severity, magnitude, and extent can also include the speed of onset and the duration of hazard events. Describing the severity/magnitude/extent of a hazard is not the same as describing its potential impacts on a community. Severity/magnitude/extent defines the characteristics of the hazard regardless of the people and property it affects.

**Previous Occurrences:** This section includes available information on historic incidents and their impacts. Historic event records form a solid basis for probability calculations.

**Probability of Future Occurrence:** The frequency of recorded past events is used to estimate the likelihood of future occurrences. Probability was determined by dividing the number of recorded events by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. For events occurring more than once annually, the probability will be reported 100% in any given year, with a statement of the average number of events annually.

### Vulnerability Assessments

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

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

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

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

Requirement §201.6(c)(2)(ii): (As of October 1, 2008) [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged in floods.

Following the hazard profile for each hazard will be the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to damages from natural hazards. The vulnerability assessments will be based on the best available county-level data, which is in the Missouri Hazard Mitigation Plan. The county-level assessments in the State Plan were based on the following sources:

- Statewide GIS data sets compiled by state and federal agencies; and
- FEMA's HAZUS-MH loss estimation software.

The vulnerability assessments in the Vernon County plan will also be based on:

- Written descriptions of assets and risks provided by participating jurisdictions;
- Existing plans and reports;
- Personal interviews with planning committee members and other stakeholders; and
- Other sources as cited.

Within the Vulnerability Assessment, the following sub-headings will be addressed:

### **Vulnerability Overview**

**Potential Losses to Existing Development:** Includes types and numbers of buildings and critical facilities.

**Previous and Future Development:** This section will include information on how changes in development have impacted the community's vulnerability to this hazard. It also includes a description of changes in development that occurred in known hazard prone areas since the previous plan have

increased or decreased the community's vulnerability and any anticipated future development in Vernon County, and how that would impact hazard risk in Vernon County.

**Hazard Summary by Jurisdiction:** For hazard risks that vary by jurisdiction, this section will provide an overview of the variation and the factual basis for that variation. For example, a community that has adopted more recent building codes and constructed safe rooms would be less vulnerable to the impact of tornados.

## **Problem Statements**

Each hazard analysis concludes with a brief summary of the problems created by the hazard in Vernon County, and possible ways to resolve those problems. Jurisdiction-specific information in those cases where the risk varies across Vernon County is included.

# 3.4.1 Dam Failure

Some specific sources for this hazard are:

- Missouri Department of Natural Resources, Dam and Reservoir Safety, <u>http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm</u>
- Stanford University's National Performance of Dams Program; http://npdp.stanford.edu/
- National Inventory of Dams
- MO DNR Dam & Reservoir Safety Program;
- National Resources Conservation Service <u>http://www.nrcs.usda.gov</u>
- DamSafetyAction.org, <u>http://www.damsafetyaction.org/MO/</u>

### Hazard Profile

#### Hazard Description

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams are typically constructed of earth, rock, concrete, or mine tailings. Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, affecting both life and property. Dam failure can be caused by any of the following:

1. **Overtopping:** - inadequate spillway design, debris blockage of spillways or settlement of the dam crest.

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

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

4. Structural Failure: caused by an earthquake, slope instability or faulty construction.

Information can be obtained from the National Resources Conservation Service at <a href="http://www.nrcs.usda.gov">http://www.nrcs.usda.gov</a> and an organization called DamSafetyAction.org, with the following Website: <a href="http://www.damsafetyaction.org/MO/">http://www.damsafetyaction.org/MO/</a>

According to the State Plan, Missouri had some 5,423 recorded dams in 2013, the largest number of man-made dams of any state in the country. Missouri's topography allows lakes to be built easily and inexpensively, which accounts for the high number of dams. Despite the large number of dams, there are only 682 (about 13%) state regulated dams, with an additional 66 federally regulated dams. Federal dams in Missouri are primarily regulated by two federal agencies; the U.S. Army Corps of Engineers (USACE) and the U.S. Department of Agriculture Forest Service. The remaining 4,495 dams are unregulated.

Dams that fall under state regulation are non-federally regulated dams that are more than 35 feet in height. Most non-federal dams are privately owned structures built either for agricultural, water supply or recreational use. The Department of Natural Resources (MDNR) Water Resources Center maintains the Dam and Reservoir Safety Program in Missouri. The program ensures that dams over 35 feet in height are safely constructed, operated and maintained pursuant to Chapter 236 of Revised Statues of Missouri. The Department of Natural Resources provides information about regulated and unregulated dams in Missouri. The information includes details of the dam dimensions, date of construction, approximate reservoir volume, contributing drainage basin area and hazard classification. In addition, USACE maintains the National Inventory of Dams (NID). The information in the NID database matches the list from the MDNR website with some additional details for dams in Vernon County. Although both agencies provide a hazard classification for dams, the dam classification systems differ.

The Missouri Dam and Reservoir Safety Council Rules and Regulations uses three classes of downstream environmental zone used when considering permits. The downstream environment zone is the area below the dam that would become inundated should the dam fail. Inundation is defined as water two feet or more over the submerged ground outside of the stream channel. These classes are based on the number of structures and types of development contained within the inundation area as presented in **Table 3.15.** The downstream environment zone classification is also used to prescribe the frequency of inspection.

Hazard Class	Definition
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 or more campgrounds with permanent water, sewer and electrical services or one 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.

#### Table 3.15. MDNR Dam Hazard Classification Definitions

Source: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/docs/rules\_reg\_94.pdf

Dams in the NID are classified according to hazard potential, an indicator of the consequences of dam failure. A dam's hazard potential, an indicator of the consequences of dam failure. A dam's hazard potential classification, presented in **Table 3.16** does not indicate its condition. Dams assigned the high hazard potential classification are those where failure will potentially result in loss of human life. Significant hazard potential are those dams where failure results in no probable loss of human life but can cause economic loss. Dams assigned the low hazard potential classification are those where failure results in no probable loss of human life and low economic or environmental losses. Losses are principally limited to the owner's property. It should be noted that there is always the possibility of loss of human life when a dam fails; this classification system does not account for the possibility of people occasionally passing through an inundation area which is usually unoccupied. For example, occasional recreational users and daytime users of downstream lands.

Hazard Class	Definition
Low Hazard	Failure results in only minimal property damage.
Significant Hazard	Failure could possibly result in the loss of life and appreciable property damage
High Hazard	If the dam were to fail, lives would be lost and extensive property damage could result.

#### Source: National Inventory of Dams

There is not a direct correlation between the State Hazard Classification and the NID Classifications. However, most dams that are in the State's Classes I and II are considered NID High Hazard Dams.

#### **Geographic Location**

#### Dams in Planning Area

There are currently 43 dams in Vernon County according to the Missouri Department of Natural Resources. Only one of the 43 dams is regulated. The regulated dam is the Bushwhacker dam located on the Little Dry Wood Creek. This dam was completed in 1981 and is used for recreational proposes. The dam is owned by the Missouri Department of Conservation.

**Table 3.17** has information about the high, significant and low hazard dams in Vernon County. It also indicates if there is an Emergency Action Plan (EAP) in place, height, last inspection date, dam owner, river, nearest downstream city, distance to the nearest downstream city and normal storage of water impounded by the dam in acre feet. An acre foot is defined as the volume of one acre of surface area to the depth of one foot.

Dam Name	Emergency Action Plan (EAP)AP	Dam Height (Ft)	Normal Storage (Acre-Ft)	Last Inspection Date	River	Nearest Downstream City	Distance To Nearest City (Miles)	Dam Owner
Beard Lake Dam	NR	20	105	-	TR-Kitten Creek	Roscoe		Euell Beard
Bushwhacker Dam	N	40	156	9/29/2015	Little Dry Wood Creek	Bronaugh	19	Mo Dept. Of Conservation
C. H. Jones Dam	NR	10	15	-	TR West Fork Clear Creek	Dederick	3	C. H. Jones
Charles Lake Dam	NR	10	130	-	TR to Pryor Creek	Horton	7	Mrs. Leona Charles
Charles Vincent Dam	NR	20	93	-	West Fork Clear Cr	Nevada	0	Unknown
Covington Dam	NR	15	35	-	TR Robinson Branch	Oak Ridge	0	Unknown
Elliott Lake Dam	NR	15	80	-	TR to Marmaton	Horton	12	Clifton Elliot
Floyd Hines Dam	NR	18	42	-	TR Beecham Branch	Eldorado Springs	0	Unknown
Foreman Lake Dam	NR	20	128	-	TR-West Fork Clear Creek	Dederick		Charles Foreman
Francis Lake Dam	NR	20	193	-	TR To Little Dry Wood	Dederick	0	Howard Francis
Fred Wilmot Dam	NR	20	40	-	TR-Little Osage River	Richards	0	Unknown
Hines Section 10 Lake Dam	NR	15	85	-	TR To Beecham	Taberville	0	Floyd Hines
Hines Section 3 North Dam	NR	20	87	-	TR To Kitten Creek	Taberville	0	Floyd Hines

Table 3.17.	High,	Significant	and Low	Hazard	Dams ir	Vernon	County

Hines Section 3 South Lake Dam	NR	20	187	-	TR To Beecham	Taberville	0	Floyd Hines
Izaak Walton Lake Dam	NR	25	67	-	TR To White Branch	Nevada	2	City Of Nevada
Jantz	NR	15	40	-	TR Shiloh Cr	Richards	0	Unknown
John L Cunningham	NR	20	36	-	TR Moore Branch	Nevada	0	Unknown
Katy Allen Lake Dam	NR	25	60	6/21/1979	Willow Branch	Nevada	0	Vernon County Mo
Kysar Lake	NR	18	41	-	TR-Osage River	Schell City		Al Kyser
Long Lower Lake Dam	NR	10	40	-	TR To Marmaton	Taberville	30	Robert S Long
Long Upper Lake Dam	NR	20	53	-	TR To Marmaton	Schell City	0	Robert S Long, DDS
Marquardt Dam	NR	15	40	-	TR West Fork Clear Creek	Nevada	0	Unknown
Marvin Vickers Dam	NR	10	20	-	TR Clear Creek	Dederick	0	Unknown
Mononame 202	NR	10	30	-	TR West Fork Clear Creek	Dederick	0	Unknown
Mononame 308	NR	21	36	-	TR Shiloh Creek	Richards	0	Unknown
Mononame 310	NR	13	26	-	TR Robinson Branch	Oak Ridge	0	Unknown
Mononame 47	NR	12	40	-	TR Osage River	Schell City	0	Unknown
Mononame 636	NR	20	46	-	TR-Clear Cr	Eldorado Springs	0	Unknown
Mononame 64	NR	19	44	-	TR Cottonwood	Metz	0	Unknown
Mononame 658	NR	20	30	-	TR Cynthia Cr	Montevallo	0	Unknown
Mononame 671	NR	20	25	-	Mckill Cr	Bronaugh	0	Unknown
Mononame 78	NR	10	47	-	TR Osage River Off stream	Schell City	0	Unknown
O'Connell Dam	NR	15	35	-	TR Marmaton River	Nevada	0	Unknown
Pickrel Dam	NR	15	70	-	TR To Little Dry Wood	Horton	0	Mary Pickrel
Pohl-Harner Lake Dam	NR	15	40	-	TR To Pryor Creek	Arthur	5	Mrs. Harner +Mrs. J Pohl
Pottorf Lake Dam	NR	25	58	-	TR To Clear Creek	Dederick	21	J L Pottorf
Radio Springs Park	NR	15	26	-	Birch Branch Off stream	Nevada	0	Unknown
Richard McWherter	NR	17	34	-	TR Dry Wood Cr	Nevada	0	Unknown
Seitz Lake Dam	NR	33	210	-	TR Moores Branch Dry	Deerfield	0	Eugene Seitz
Steele Lake Dam	NR	22	125	-	TR-West Fork Dry Wood	Deerfield		Louis Mack Steele

Timber Hill River Bend Inc Dam	NR	15	66	-	TR To Little Osage River	Taberville	27	Timber Hill River Bend
Wilmot & Steele Inc Lake Dam	NR	20	54	-	TR To Little Osage River	Horton	9	Wilmot & Steele Inc
Wilson Lake Dam	NR	20	56	-	TR To West Fork Clear	Dederick	0	Gilbert Wilson

RED- High Hazard Dams YELLOW- Significant Hazard Dams WHITE- Low Hazard Dams

Sources: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm and National Inventory of Dams

Figure 3.2. Dam Locations in Vernon County and Upstream Dams Outside of Vernon County.



Source: U.S. Army Corps of Engineers, Missouri Department of Natural Resources

#### Upstream Dams Outside the Planning Area

There are no high hazard dams located upstream from Vernon County. **Figure 3.2** shows the locations of dams located outside of Vernon County.



## Figure 3.3

### Severity/Magnitude/Extent

The severity/magnitude of dam failure would be similar in some cases to the impacts associated with flood events (see the flood hazard vulnerability analysis and discussion). Based on the hazard class definitions, failure of any of the High Hazard/Class I dams could result in a serious threat of loss of human life, serious damage to residential, industrial or commercial areas, public utilities, public buildings, or major transportation facilities. Catastrophic failure of any high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. Note that for this reason, dam failures could flood areas outside of mapped flood hazards.

Bushwhacker Dam is the only significant hazard dam regulated by the State in Vernon County.

### **Previous Occurrences**

According to the National Performance of Dams Program there have been no dam failures reported for Vernon County.

#### Probability of Future Occurrence

Since Vernon County has no record of dam failure, the calculation is not possible. According to the information from the Missouri State Plan, Missouri's percentage of high hazard dams in the DNR Inventory puts the State at about the national average for that category. However, if development occurs downstream of dams the percentage of high hazard dams will increase. Additionally, the probability of dam failure may increase, as many of the smaller and privately owned dams continue to deteriorate without the benefit of further regulation or improvements. Regular inspection and maintenance greatly reduces the probability of dam failure.

### **Vulnerability**

#### **Vulnerability Overview**

Vulnerability to dam failure in Vernon County is limited to structures and critical infrastructure located in dam inundation areas. There are five dams in Vernon County that are classified as high hazard dams, and two significant hazard dams. The drainage area of Bushwhacker Dam is 2,650 acres. Izzak Walton Lake Dam's drainage area is 1,000 acres. Hines Section 10 Lake Dam is 270 acres. Pohl-Harner Lake Dam has a drainage area of 80 acres. Katy Allen Lake Dam has a drainage area of 625 acres. Wilson Lake Dam has a drainage area of 200 acres, and Foreman Lake Dam has a drainage area of 263 acres.

# Potential Losses to Existing Development: (including types and numbers, of buildings, critical facilities, etc.)

It is possible that the City of Nevada and the City of Bronaugh would sustain structural losses from this hazard Structures downstream of these dam locations could potentially be at risk if a failure were to occur depending on the size of the reservoir behind the dam. The potential impact on structures and human life downstream from a dam failure directly correlates to the amount of water and/or debris that is behind the dam. As stated in the hazard profile, it is important to take into account the age of the data that has been compiled on state regulated and unregulated dams in the county and in the state. Because data on unregulated dams was collected in the late 1970's and early 1980's it is not necessarily reliable to use when looking at possible areas of impact.

#### Impact of Previous and Future Development

Vernon County is very rural in nature and little development has been occurring in the last 10 years, therefore an increased risk is not anticipated. Although, it is possible that future development could occur downstream of any high or significant hazard dams in Vernon County. Development in the inundation area would increase the exposure to a possible dam failure event.

#### Hazard Summary by Jurisdiction

The City of Nevada, the City of Bronaugh and parts of unincorporated Vernon County are at low risk of dam failure. Dam failure has the potential to impact future development in the county and its jurisdictions. Many dams in Vernon County are privately owned and not regulated by the state. The potential for

development below aging or unsafe dams is an issue that needs to be addressed.

### Problem Statement

Overall, dam failure is a relatively low risk to Vernon County and incorporated communities. Regular inspections and maintenance may reduce the likelihood of an event occurring. Although, the probability of a dam failure in Vernon County is low, potential for damage remains.

Residents and communities near high and significant hazard dams should be familiar with the dam's Emergency Action Plan (EAP), if available. Emergency Plans are written for dams include procedures for notification and coordination with local law enforcement and other governmental agencies, information on the potential inundation areas, plans for warnings and evacuation, and procedures for making emergency repairs. It would be advantageous for jurisdictions to work closely with dam operators and participate in dam emergency exercises.

# 3.4.2 Drought

Some specific sources for this hazard are:

- Maps of effects of drought, National Drought Mitigation Center (NDMC) located at the University of Nebraska in Lincoln; <u>http://www.drought.unl.edu/</u>.
- Historical drought impacts, National Drought Mitigation Center (NDMC) located at the University of Nebraska in Lincoln; at <u>http://droughtreporter.unl.edu/</u>.
- Recorded low precipitation, NOAA Regional Climate Center, (<u>http://www.hprcc.unl.edu</u>).
- Water shortages, Missouri's Drought Response Plan, Missouri Department of Natural Resources, <u>http://dnr.mo.gov/pubs/WR69.pdf</u>
- Populations served by groundwater by county, USGS-NWIS, <u>http://maps.waterdata.usgs.gov/mapper/index.html</u>
- Census of Agriculture, <u>https://www.agcensus.usda.gov/Publications/2012/Online\_Resources/County\_Profiles/Missouri/in\_dex.asp\_and\_</u>
   <u>http://www.agcensus.usda.gov/Publications/2012/Online\_Resources/County\_Profiles/Missouri/</u>
- USDA Risk Management Agency, Insurance Claims, https://www.rma.usda.gov/data/cause
- Natural Resources Defense Council, http://www.nrdc.org/globalWarming/watersustainability/

### Hazard Profile

#### Hazard Description

Drought is generally defined as a condition of moisture levels significantly below normal for an extended period of time over a large area that adversely affects plants, animal life, and humans. A drought period can last for months, years, or even decades. There are four types of drought conditions relevant to Missouri, according to the State Plan, which are as follows.

- <u>Meteorological</u> drought is defined in terms of the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. A meteorological drought must be considered as region-specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.
- <u>Hydrological</u> drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., streamflow, reservoir and lake levels, ground water). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and ground water and reservoir levels. As a result, these impacts also are out of phase with impacts in other economic sectors.
- <u>Agricultural</u> drought focus is on soil moisture deficiencies, differences between actual and potential evaporation, reduced ground water or reservoir levels, etc. Plant demand for water

depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.

• <u>Socioeconomic</u> drought refers to when physical water shortage begins to affect people.

Data sources: http://www.drought.unl.edu/ http://droughtreporter.unl.edu/

### Geographic Location

The entire planning area is potentially at risk for drought. However, since the most common drought in Central Missouri is agricultural drought, the jurisdiction at risk most is the unincorporated agricultural area of Vernon County. This is the area where farmers are at risk for crop failure from drought and would suffer the most immediate and severe economic loss. The links below give more information on agriculture at the county level.

http://www.agcensus.usda.gov/Publications/2012/Full\_Report/Volume\_1, Chapter\_2 County\_Level/ <u>Missouri/</u> and \_ <u>http://www.agcensus.usda.gov/Publications/2012/Online\_Resources/County\_Profiles/Missouri/</u> https://www.agcensus.usda.gov/Publications/2012/Online\_Resources/County\_Profiles/Missouri/

#### Severity/Magnitude/Extent

The National Drought Monitor Center at the University of Nebraska at Lincoln summarized the potential severity of drought as follows. Drought can create economic impacts on agriculture and related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn place both human and wildlife populations at higher levels of risk. Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Finally, while drought is rarely a direct cause of death, the associated heat, dust and stress can all contribute to increased mortality.

**Figure 3.4** is a recent map from the U.S. Drought Monitor and an example of the size of the geographic area that could be in drought at any given moment in time. The map is only a snapshot of conditions at a given time and indicated the severity of drought conditions.

Figure 3.4.







Source: U.S. Drought Monitor, http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?MO

There are two programs that were authorized by the 2014 Farm Bill. Agricultural Loss Coverage-County (ARC-CO) and Price Loss Coverage (PLC). The ARC-CO program provides revenue loss coverage at the county level. ARC-CO payments are issued when the actual county crop revenue of a covered commodity is less than the ARC-CO guarantee for the covered commodity. PLC program payments are issued when the effective price of a covered commodity is less than the respective reference price for that commodity. The effective price equals the higher of the market year average price (MYA) or the national average loan rate for the covered commodity. According the USDA's Farm Service Agency in 2014 Vernon County received a total of \$5,847 in ARC-CO payments. In 2015 Vernon County received a total of \$148,889 in PLC payments and \$63,319 in ARC-CO payments. In 2016 Vernon County received a total of \$409,057 in PLC payments and \$34,215 in ARC-CO Payments. Since 1999 Vernon County has had a total of \$18.24M in Crop Damage due to Drought. In 2012 Vernon County had 2.4M in Crop Damage alone.

The Most commonly used indicator of drought and drought severity is the Palmer Drought Severity Index (PDSI), jointly published by the NOAA and the United States Department of Agriculture. The Palmer Drought indices measure dryness based on recent precipitation and temperature. The indices are based on a "supply-and-demand model" of soil moisture. Calculation of supply is relatively straightforward, using temperature and the amount of moisture in the soil. However, demand is more complicated as it depends on a variety of factors, such as evapotranspiration and recharge rates. These rates are harder to calculate. Palmer tried to overcome these difficulties by developing an algorithm that approximated these rates, and based the algorithm on the most readily available data — precipitation and temperature.

The Palmer Index has proven most effective in identifying long-term drought of more than several months. However, the Palmer Index has been less effective in determining conditions over a matter of weeks. It uses a "0" as normal, and drought is shown in terms of negative numbers; for example, negative 2 is moderate drought, negative 3 is severe drought, and negative 4 is extreme drought. Palmer's algorithm also is used to describe wet spells, using corresponding positive numbers.

According to the MDNR Missouri Drought Plan revised in 2002, Missouri's drought response system is divided into four phases based on Palmer index values:

- **Phase I: Advisory Phase-** Requires a drought monitoring and assessment system to provide enough lead time for state and local planners to take appropriate action;
- **Phase II: Drought Alert-** When the PDSI reads -1.0 to -2.0, and stream flows, reservoir levels and groundwater levels are below normal over a several month period, or when the Drought Assessment Committee (DAC) determines that Phase II conditions exist based on other drought determination methods;
- Phase II: Conservation Phase- When the PDSI reads -2.0 to -4.0 and stream flows, reservoir levels, and groundwater levels continue to decline, along with forecasts indicating an extended period of below-normal precipitation, or when the DAC determines that Phase III conditions exist based on other drought determination models;
- **Phase IV: Drought Emergency-** When the PDSI is lower than -4.0, or when the DAC determines that Phase IV conditions exist based on other drought determination methods.

Palmer also developed a formula for standardizing drought calculations for each individual location based on the variability of precipitation and temperature at that location. The Palmer index can therefore be applied to any site for which sufficient precipitation and temperature data is available.

Jurisdictions in Vernon County rely on surface water for their water supply according to USGS Nation Water Information System. Drought can easily have an impact on communities who rely on surface water. (<u>http://maps.waterdata.usgs.gov/mapper/index.html</u> is a USGS site called the National Water Information System Mapper.)

### **Previous Occurrences**

The NCEI Storm Events Database includes 18 drought events occurring in Vernon County from 1999 through 2018. Many of these were multiple reports from persistent drought events that lasted several months. The NCEI reports indicate that there were five distinct drought periods during the 18-year timeframe. **Table 3.18** provides previous drought occurrences in Vernon County.

Drought Year	Duration	Property Damage	Crop Damage	
2000	August-September	0	0	
2006	January-April	0	0	
2011	September-November	0	0	
2012	July-December	450.00K	18.240M	
2013	January-March	0	0	

#### Table 3.18. Previous Drought Occurrences 1999-2017

Source: https://www.ndcd.noaa.gov/stormevents/

#### Probability of Future Occurrence

Over the 19-year record period, Vernon County was in a drought for 18 months. There are a total of 229 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 gives an 94.7% probability of drought in any given month in the county. Although drought is not predictable, long-range outlooks and predicted impacts of climate change could indicate an increased chance of drought.

## **Vulnerability**

### Vulnerability Overview

The agriculture sector is particularly vulnerable to drought. Periods of dry weather can reduce stock ponds and force the early sale of livestock. Crop production can be disrupted and vegetative diseases can spread reducing yields. Individuals that operate water wells can experience water shortages during persistent drought periods like the six-month drought period in 2012. Those that rely on private wells are likely to be impacted by reductions in the groundwater supply. Waste water treatment facilities may also be impacted, as it could limit the ability to discharge due to lower water levels and produce dangerous or unlawful levels of contaminants.

#### Potential Losses to Existing Development

According to data from USDA Risk Management Agency, there was a total of \$661,327 in insured crop loss payments in Vernon County between 2014-2016 and from 1999 to 2017 there was 18.24M in crop damage reported. Based on pass losses, there is a potential that future droughts could result in crop losses. The exact extent of future loss and damage cannot be determined. There are many factors that would affect the outcome, such as type of crop planted, current market price, area and length of drought. There are no anticipated structural losses, loss of life or injuries associated with this hazard.

#### Impact of Previous and Future Development

Increases in acreage planted crops would add to exposure to drought-related agricultural losses. In addition, increases in population result in increased demand for treated water and increase waste water discharge, adding additional strain on water systems.

#### Impact of Climate Change

A new analysis, performed for the Natural Resources Defense Council, examined the effects of climate change on water supply and demand in the contiguous United States. The study found that more than 1,100 counties will face higher risks of water shortages by mid-century as a result of climate change. Two of the principal reasons for the projected water constraints are shifts in precipitation and potential evapotranspiration (PET). Climate models project decreases in precipitation in many regions of the U.S., including areas that may currently be described as experiencing water shortages of some degree.

The Natural Resources Defense Council developed a new water supply sustainability index. The risk to water sustainability is based on the following criteria:

- Projected water demand as a share of available precipitation
- Groundwater use as a share of projected available precipitation

- Susceptibility to drought
- Projected increase in freshwater withdrawals
- Projected increase in summer water deficit

The risk to water sustainability for counties meeting two of the criteria are classified as "moderate", while those meeting three of the criteria are classified as "high", and those meeting four or more are classified as "extreme". Counties meeting less than two criteria are considered to have low risk to water sustainability. According to the Natural Resources Defense Council, without climate change the water supply sustainability index for Vernon County is low. With climate change, the water supply sustainability index increases to moderate (NRDC).

#### Hazard Summary by Jurisdiction

Although the probability of drought is the same for the entire county, farming and livestock enterprises in the unincorporated parts of the county would feel the greatest impact. Although communities with wells are susceptible to water shortages due to groundwater reduction, other communities with no source are more at risk to extreme water shortages in the event of a drought.

### Problem Statement

Although drought most likely will not cause structural damage, the impact is greatest on the agriculture sector and if persistent enough, could cause reductions in groundwater and water shortages in communities that provide potable water services. Potential actions to mitigate the impact of drought would be for communities to develop public information campaigns regarding water conservation techniques and measures, and provide notification mechanisms for community members to know when drought conditions may occur. Some methods may include restricting the use of public water resources for non-essential usage, such as landscaping, washing cars, filing swimming pools, etc. during extreme drought periods. Schools and special districts can also implement water conservation measures at all district facilities as well.

# 3.4.3 Earthquakes

Some specific sources for this hazard are:

- U.S. Seismic Hazard Map, United States Geological Survey, <u>https://earthquake.usgs.gov/hazards/hazmaps/conterminous/2014/images/HazardMap2014\_Ig.jp</u> <u>g;</u>
- 6.5 Richter Magnitude Earthquake Scenario, New Madrid Fault Zone map, <u>http://www.igsb.uiowa.edu/Browse/quakes/quakes.htm;</u>

# Hazard Profile

#### Hazard Description

An earthquake is a sudden motion or trembling that is caused by a release of energy accumulated within or along the edge of the earth's tectonic plates. Earthquakes occur primarily along fault zones and tears in the earth's crust. Along these faults and tears in the crust, stresses can build until one side of the fault slips, generating compressive and shear energy that produces the shaking and damage to the built environment. Heaviest damage generally occurs nearest the earthquake epicenter, which is that point on the earth's surface directly above the point of fault movement. The composition of geologic materials between these points is a major factor in transmitting the energy to buildings and other structures on the earth's surface.

#### **Geographic Location**

The New Madrid Fault Zone can have an effect on Vernon County if an earthquake were to happen on this fault line. Vernon County falls into a risk zone for a hypothetical quake along the New Madrid Fault. Vernon County would be effected if there was a big enough earthquake along the New Madrid Fault. The data in the table below indicates that earthquake intensity will not vary across the planning area, which will be the case in most Missouri counties as well as Vernon County.

**Figure 3.55** shows the highest projected Modified Mercalli intensities by county from a potential magnitude 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid Seismic Zone. The secondary maps in Figure 3.5 show the same regional intensities for 6.7 and 8.6 earthquake, respectively. Vernon County is located in zone VI from a potential magnitude 7.6 earthquake along the New Madrid fault. Residents would feel movement, there could be minimal damage to structures, dishes and glassware would likely be broken.
# Figure 3.5.

#### Impact Zones for Earthquake Along the New Madrid Fault



Source:

http://sema.dps.mo.gov/docs/programs/Planning,%20Disaster%20&%20Recovery/State%20of%20Missouri%20Hazard%20Analysis/201 2-State-Hazard-Analysis/Annex\_F\_Earthquakes.pdf

#### PROJECTED EARTHQUAKE INTENSITIES

# MODIFIED MERCALLI INTENSITY SCALE

- 1 People do not feel any Earth movement.
- 11 A few people might notice movement.
- III Many people indoors feel movement. Hanging objects swing.
- 1V Most people indoors feel movement. Dishes, windows, and doors rattle. Walls and frames of structures creak. Liquids in open vessels are slightly disturbed. Parked cars rock.
  - Almost everyone feels movement. Most people are awakened. Doors swing open or closed. Dishes are broken. Pictures on the wall move. Windows crack in some cases. Small objects move or are turned over. Liquids might spill out of open containers.
  - Everyone feels movement. Poorly built buildings are damaged slightly. Considerable quantities of dishes and glassware, and some windows are broken. People have trouble walking. Pictures fall off walls. Objects fall from shelves. Plaster in walls might crack. Some furniture is overturned. Small bells in churches, chapels and schools ring.
  - People have difficulty standing. Considerable damage in poorly built or badly designed buildings, adobe houses, old walls, spires and others. Damage is slight to moderate in well-built buildings. Numerous windows are broken. Weak chimneys break at roof lines. Cornices from towers and high buildings fall. Loose bricks fall from buildings. Heavy furniture is overturned and damaged. Some sand and gravel stream banks cave in.

Drivers have trouble steering. Poorly built structures suffer severe damage. Ordinary substantial buildings partially collapse. Damage slight in structures especially built to withstand earthquakes. Tree branches break. Houses not bolted down might shift on their foundations. Tall structures such as towers and chimneys might twist and fall. Temporary or permanent changes in springs and wells. Sand and mud is ejected

in small amounts.

VIII

- IX Most buildings suffer damage. Houses that are not bolted down move off their foundations. Some underground pipes are broken. The ground cracks conspicuously. Reservoirs suffer severe damage.
- x
  - Well-built wooden structures are severely damaged and some destroyed. Most masonry and frame structures are destroyed, including their foundations. Some bridges are destroyed. Dams are seriously damaged. Large landslides occur, Water is thrown on the banks of canals, rivers, and lakes. Railroad tracks are bent slightly. Cracks are opened in cement pavements and asphalt road surfaces.
  - XI Few if any masonry structures remain standing. Large, well-built bridges are destroyed. Wood frame structures are severely damaged, especially near epicenters. Buried pipelines are rendered completely useless. Railroad tracks are badly bent. Water mixed with sand, and mud is ejected in large amounts.
- XII Damage is total, and nearly all works of construction are damaged greatly or destroyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move. Lakes are dammed, waterfalls formed and rivers are deflected.

Intensity is a numerical index describing the effects of an earthquake on the surface of the Earth, on man, and on structures built by man. The intensities shown in these maps are the highest likely under the most adverse geologic conditions. There will actually be a range in intensities within any small area such as a town or county, with the highest intensity generally occurring at only a few sites. Earthquakes of all three magnitudes represented in these maps occurred during the 1811 - 1812 "New Madrid earthquakes." The isoseismal patterns shown here, however, were simulated based on actual patterns of somewhat smaller but damaging earthquakes that occurred in the New Madrid seismic zone in 1843 and 1895.

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Figure 3.76 illustrates seismicity in the United States. Vernon County is located in the southwest portion of the state of Missouri.



Figure 3.6. United States Seismic Hazard Map

Source: United States Geological Survey at http://earthquake.usgs.gov/hazards/products/conterminous/2014/HazardMap2014\_lg.jpghttps://earthquake.usgs.gov/hazards/hazmaps /conterminous/2014/images/HazardMap2014\_lg.jpg

#### Severity/Magnitude/Extent

The extent or severity of earthquakes is generally measured in two ways: 1) the Richter Magnitude Scale is a measure of earthquake magnitude; and 2) the Modified Mercalli Intensity Scale is a measure of earthquake severity. The two scales are defined a follows.

#### Richter Magnitude Scale

The Richter Magnitude Scale was developed in 1935 as a device to compare the size of earthquakes. The magnitude of an earthquake is measured using a logarithm of the maximum extent of waves recorded by seismographs. Adjustments are made to reflect the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, comparing a 5.3 and a 6.3 earthquake shows that the 6.3 quake is ten times bigger in magnitude. Each whole number increase in magnitude represents a tenfold increase in measured amplitude because of the logarithm. Each whole number step in the magnitude scale represents a release of approximately 31 times more energy.

### Modified Mercalli Intensity Scale

The intensity of an earthquake is measured by the effect of the earthquake on the earth's surface. The intensity scale is based on the responses to the quake, such as people awakening, movement of furniture, damage to chimneys, etc. The intensity scale currently used in the United States is the Modified Mercalli (MM) Intensity Scale. It was developed in 1931 and is composed of 12 increasing levels of intensity. They range from imperceptible shaking to catastrophic destruction, and each of the twelve levels is denoted by a Roman numeral. The scale does not have a mathematical basis, but is based on observed effects. Its use gives the laymen a more meaningful idea of the severity.

#### **Previous Occurrences**

Vernon County has a very low earthquake risk, with a total of 0 earthquakes since 1931. The current Missouri State Plan shows there have been 31 recorded 4.0M or greater earthquakes on the New Madrid Fault Line in the last 43 years in Missouri.

### Probability of Future Occurrence

The probability that an earthquake of any measurable magnitude will happen in Vernon County is unknown at this time. Without a definite historical record for earthquakes in the 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%.

Figure 3.6 indicates the potential for an earthquake in Vernon County and anywhere along the New Madrid fault, indicating that it is likely that parts of Vernon County may experience some shaking or limited earthquake type events.

# Vulnerability

# Vulnerability Overview

Ground shaking is the most damaging effect from earthquakes. Ground shaking will impact all structures and critical infrastructure such as roads and electrical transmission systems. The greatest and most impactful earthquake risk to Vernon County is the New Madrid fault in the boot-heel region of Missouri. A 7.6 magnitude earthquake would result in poorly built buildings damaged slightly; considerable quantities of dishes, glassware and windows are broken; people having trouble walking; pictures falling off walls; objects falling from shelves etc. Damage to structures will occur but will vary on the quality of construction. Some injuries may occur but fatalities are unlikely.

# Potential Losses to Existing Development

Potential losses to existing development include the total exposure for all communities listed in Table 3.3 and Table 3.6 in the Assets at Risk section of this chapter. The total exposure of each jurisdiction was used to estimate losses due to a 76 earthquake along the New Madrid Fault. A damage factor of 0.5% was applied to each jurisdiction's total building and contents based on the expected impact for Zone VI on the modified Mercalli scale. **Table 3.19** depicts the estimated losses in each jurisdiction based on total exposure and a 0.5% damage factor.

Table 3.19.	Estimated Potential Earthquake Losses
-------------	---------------------------------------

Jurisdiction	Potential Earthquake Losses
Vernon County	\$1,772,817.80
City of Bronaugh	\$23,193.44
Village of Deerfield	\$12,200.04
Village of Metz	\$18,676.23
City of Nevada	\$2,048,074.91
City of Richards	\$20,189.49
City of Schell City	\$77,787.53
City of Sheldon	\$82,123.02
Village of Stotesbury	\$4,653.21
City of Walker	\$68,173.63
Sac Osage Electric Cooperative	\$2,623,758.67
Bronaugh R-VII	\$331,379.40
Nevada R-V School District	\$3,157,891.65
Sheldon R-VIII School District	\$463,444.20

#### Impact of Previous and Future Development

Previous development that may have been constructed with adherence to building codes may be at a greater risk of damage during an event. Future development is not expected to increase the risk other than contributing to the overall exposure of what could become damaged as a result of an event.

#### Hazard Summary by Jurisdiction

Earthquake intensity is not likely to vary greatly throughout the planning area, that the risk will be the same throughout. However, damages will differ if there are structural variations in the planning area based on percentages of structures built prior to 1939. For example, if one community has a higher percentage of residences built prior to 1939 than the other jurisdictions, that community is likely to experience higher damages. **Table 3.20** shows the number and percentage of housing units built prior to 1939 or earlier.

School districts with facilities constructed prior to 1939 could suffer more damages than newer facilities, however, the majority of the currently utilized school facilities in the districts have been constructed after 1939 and are considered well-built structures and therefore, less vulnerable to potential ground shaking.

Sac Osage Electric Cooperative is at risk to the damages of earthquakes. Ground shaking can affect the structural integrity of electric power assets through various modes of permanent ground deformation; soil liquefaction, lateral spreading, and/or vertical displacement. Historically, electrical transmission lines are not particularly vulnerable to significant earthquake damage, but distribution systems, transmission towers, and substation components are at a risk of damage. Earthquake damage could include broken porcelain components, toppled equipment, line failures, and leaking gaskets. Distribution lines are not as vulnerable to earthquakes; however, some damage can occur if trees fall into wires or poles, platform-mounted transformers topple, or wires get tangled.

### Table 3.20. Percent of Housing Units Built in 1939 or Earlier

Jurisdiction	Built 1939 or earlier #	Built 1939 or earlier %
Vernon County	17	0.4%
City of Bronaugh	6	9.4%
Village of Deerfield	4	16.0%
Village of Metz	2	2.7%
City of Nevada	312	9.3%
City of Richards	5	5.7%
City of Schell City	4	2.9%
City of Sheldon	17	15.6%
Village of Stotesbury	1	5.3%
City of Walker	9	6.1%

Source: Vernon County Assessor

# **Problem Statement**

Based on likely damage from a 7.6 magnitude earthquake along the New Madrid fault, older poorly built structures will suffer slight damage. The Village of Deerfield has the highest percentage of houses built in 1939 or before, and the City of Sheldon has the second highest percentage. However, the City of Nevada has the highest number of structures build prior to 1939. These jurisdictions will likely experience the most damage to structures. Potential damages to future development can be mitigated by adopting and enforcing at least IBC 2012 building codes. Updating and enforcing building codes throughout Vernon County would mitigate the impact on future development from an earthquake event.

# 3.4.4 Extreme Heat

# Hazard Profile

Some specific sources for this hazard are:

- National Centers for Environmental Information, Storm Events Database, <u>http://www.NCEI.noaa.gov/stormevents/</u>
- Heat Index Chart & typical health impacts from heat, National Weather Service; National Weather Service Heat Index Program, <u>www.weather.gov/os/heat/index.shtml</u>;
- Daily temperatures averages and extremes, High Plains Regional Climate Summary, <u>http://climod.unl.edu/;</u>
- Hyperthermia mortality, Missouri; Missouri Department of Health and Senior Service, <u>http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper1.pdf;</u>
- Hyperthermia mortality by Geographic area, Missouri Department of Health and Senior Services,
- http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper2.pdf;

#### Hazard Description

Extreme temperature events, both hot and cold, can impact human health and mortality, natural ecosystems, agriculture and other economic sectors. The remainder of this section profiles extreme heat. Extreme cold events are profiled in combination with Winter Storm in **Section 3.4.11.** According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. The relationship of these factors creates what is known as the apparent temperature. The Heat Index chart shown in **Figure 3.7** uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

#### Figure 3.7.



	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	1.30	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	1,37		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	123	137				
65	82	85	89	93	98	103	108	114	121	138	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	182							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	1.26	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

#### Temperature (°F)

#### Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Source: National Weather Service (NWS)

Note: Exposure to direct sun can increase Heat Index values by as much as 15°F. The shaded zone above 105°F corresponds to a HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

Danger

Extreme Danger

#### Geographic Location

Extreme heat is an area-wide hazard event, and that the risk of extreme heat does not vary across Vernon County. Extreme heat can happen in Vernon County during the hotter months and can happen anywhere within the County.

#### Severity/Magnitude/Extent

Extreme heat can cause stress to crops and animals. According to USDA Risk Management Agency, losses to insurable crops during the 10-year time period from 2005 to 2015 were \$13,613.34. Extreme heat can also strain electricity delivery infrastructure overloaded during peak use of air conditioning during extreme heat events. Another type of infrastructure damage from extreme heat is road damage. When asphalt is exposed to prolonged extreme heat, it can cause buckling of asphalt-paved roads, driveways, and parking lots.

From 1988-2011, there were 3,496 fatalities in the U.S. attributed to summer heat. This translates to an annual national average of 146 deaths. During the same period, zero deaths were recorded in the planning area, according to NCEI data. The National Weather Service stated that among natural hazards, no other natural disaster—not lightning, hurricanes, tornadoes, floods, or earthquakes—causes more deaths.

Those at greatest risk for heat-related illness include infants and children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather. In agricultural areas, the exposure of farm workers, as well as livestock, to extreme temperatures is a major concern.

Table 3.21 lists typical symptoms and health impacts due to exposure to extreme heat.

#### Table 3.21. Typical Health Impacts of Extreme Heat

Heat Index (HI)	Disorder		
80-90° F (HI)	Fatigue possible with prolonged exposure and/or physical activity		
90-105° F (HI)	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity		
105-130° F (HI)	Heatstroke/sunstroke highly likely with continued exposure		
Source: National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml			

The National Weather Service has an alert system in place (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when for two or more consecutive days: (1) when the maximum daytime Heat Index is expected to equal or exceed 105 degrees Fahrenheit (°F); and the night time minimum Heat Index is 80°F or above. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees.

# **Previous Occurrences**

Vernon County had 66 Days with maximum temperatures above 90°F during May-September 2016. There have been nine (9) heat related events in Vernon County recorded in the National Centers for Environmental Information (NCEI) database from 1950 to 2017. There were 3 reported deaths and no injuries or property and crop damage associated with these events in the NCEI data for Vernon County. The event narratives describe fatalities that occurred during regional multi-county heat events for other nearby counties.

**Figure 3.8**, is a map created by the Missouri Department of Health and Senior Services (DHSS) for heat related fatalities by county. The map indicates that there have been between one (1) and three (3) heat related fatalities in Vernon County from 2000-2013.

Heat Related Deaths in Missouri 2000 - 2013



# Number of Heat Related Deaths in Missouri by County\*\* for 2000 - 2013^

# Probability of Future Occurrence

Vernon County had a total of nine (9) heat related events in a thirteen (13) year span, the probability that an extreme heat event will occur in Vernon County is 69% in any given year. Vernon County has moderate risk of heat related events, but one could take place at any time.

# **Vulnerability**

#### Vulnerability Overview

High humidity, which often accompanies heat in Missouri, can make the effects of heat even more harmful. While heat-related illness and death can occur from exposure to intense heat in just one afternoon, heat stress on the body has a cumulative effect. Consequently, the persistence of a heat wave increases the threat to public health. The people most at risk are children under five years of

age and adults over the age of 65, as well as people who work outdoors. The agriculture sector can also suffer crop loss during periods of extreme heat. Extreme heat may also cause buckling of roads.

# Potential Losses to Existing Development

Based on the information in the 2013 Plan and DHSS, one to three heat related fatalities may occur within Vernon County over the next 13 years.

#### Impact of Previous and Future Development

Population growth can result in increases in the age-groups that are most vulnerable to extreme heat. Population growth also increases the strain on electricity infrastructure, as more electricity is needed to accommodate the growing population. Vernon County as a whole has experienced a small amount of growth in population since the 2010 census.

### Hazard Summary by Jurisdiction

Those at greatest risk for heat-related illness and deaths include children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. To determine jurisdictions within the planning area with populations more vulnerable to extreme heat, demographic data was obtained from the 2010 census on population percentages in each jurisdiction comprised of those under age 5 and over age 65. Data was not available for overweight individuals and those on medications vulnerable to extreme heat. **Table 3.22** below summarizes vulnerable populations in the participating jurisdictions. Note that school and special districts are not included in the table because students and those working for the special districts are not customarily in these age groups.

Jurisdiction	Population Under 5 yrs.	Population 65 yrs. and over
Vernon County	1,258	3,677
City of Bronaugh	13	22
Village of Deerfield	4	15
Village of Metz	0	12
City of Nevada	550	1,632
City of Richards	0	5
City of Schell City	17	57
City of Sheldon	49	62
Village of Stotesbury	2	13
City of Walker	23	37

# Table 3.22. Vernon County Population Under Age 5 and Over Age 65, 2010 Census Data

Source: U.S. Census Bureau, (\*) includes entire population of each city or county

All schools in the planning area have proper air-conditioning and all follow proper procedures in the event of extreme heat. However, daycare and eldercare facilities may be at risk of heat related injuries if facilities are not properly cooled.

# Problem Statement

Older and younger segments of the population are more vulnerable to the impact of extreme heat. In addition, people living below the poverty level may be more vulnerable during periods of extreme heat due to a lack of air conditioning or utilities in their homes. Institutionalized populations, such as

those living in nursing home, become more vulnerable to extreme heat due to power outages. The cities with nursing homes and daycare centers can increase the potential impact of extreme heat events.

# 3.4.5 Fires (Urban/Structural and Wild)

The specific sources for this hazard are:

- Missouri Department of Conversation Wildfire Data Search at <u>http://mdc7.mdc.mo.gov/applications/FireReporting/Report.aspx</u>
- Statistics, Missouri Division of Fire Safety;
- National Statistics, US Fire Administration;
- Fire/Rescue Mutual Aid Regions in Missouri;
- Forestry Division of the Missouri Dept. of Conservation;
- National Fire Incident Reporting System (NFIRS), <u>http://dfs.dps.mo.gov/programs/resources/fire-incident-reporting-system.php</u> <u>http://www.dfs.dps.mo.gov/programs/resources/fire-incident-reporting-system.asp</u>
- Firewise, <u>www.firewise.org</u>
- University of Wisconsin Slivis Lab, <u>http://silvis.forest.wisc.edu/maps/wui/2010/download</u>

### Hazard Profile

#### Hazard Description

Vernon County has eliminated structural fires as a hazard but still can suffer from wildfire events. The types of wildfire events that can take place in Vernon county are considered natural vegetation fire, outside rubbish fire, special outside fire, and cultivated vegetation, crop fire.

The Missouri Division of Fire Safety (MDFS) indicates that approximately 80 percent of the fire departments in Missouri are staffed with volunteers. Whether paid or volunteer, these departments are often limited by lack of resources and financial assistance. The impact of a fire to a single-story building in a small community may be as great as that of a larger fire to a multi-story building in a large city.

The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works closely with volunteer fire departments and federal partners to assist with fire suppression activities. Currently, more than 900 rural fire departments in Missouri have mutual aid agreements with the Forestry Division to obtain assistance in wildfire protection if needed.

Most of Missouri fires occur during the spring season between February and May. The length and severity of both structural and wildland fires depend largely on weather conditions. Spring in Missouri is usually characterized by low humidity and high winds. These conditions result in higher fire danger. In addition, due to the recent lack of moisture throughout many areas of the state, conditions are likely to increase the risk of wildfires. Drought conditions can also hamper firefighting efforts, as decreasing water supplies may not prove adequate for firefighting. It is common for rural residents burn their garden spots, brush piles, and other areas in the spring. Some landowners also believe it is necessary to burn their forests in the spring to promote grass growth, kill ticks, and reduce brush.

Therefore, spring months are the most dangerous for wildfires. 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.

# **Geographic Location**

Damages due to wildfires would be higher in communities with more wildland–urban interface (WUI) areas. The term refers to the zone of transition between unoccupied land and human development and needs to be defined in the plan. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. Each of the communities in Vernon County have some risk of wildfire. The rural areas of Vernon County are most at risk from wildfires. Debris burning is consistently the number one cause of wildfires in Missouri. Fires caused by lightening are rare despite 50 to 70 thunderstorm days per year.

Figure 3.9 shows the Wildland/Urban Intermix for Vernon County.

# Figure 3.9. Vernon County Wildland/Urban Intermix

# WILDLAND-URBAN INTERFACE (WUI) CHANGE 1990-2010



University of Wisconsin Slivis Lab, http://silvis.forest.wisc.edu/maps/wui/2010/download

# Severity/Magnitude/Extent

Wildfires damage the environment, killing some plants and occasionally animals. Firefighters have been injured or killed, and structures can be damaged or destroyed. The loss of plants can heighten the risk of soil erosion and landslides. Although Missouri wildfires are not the size and intensity of those in the Western United States, they could impact recreation and tourism in and near the fires.

Wildland fires in Missouri have been mostly a result of human activity rather than lightning or some

other natural event. Wildfires in Missouri are usually surface fires, burning the dead leaves on the ground or dried grasses. They do sometimes "torch" or "crown" out in certain dense evergreen stands like eastern red cedar and shortleaf pine. However, Missouri does not have the extensive stands of evergreens found in the western US that fuel the large fire storms seen on television news stories.

While very unusual, crown fires can and do occur in Missouri native hardwood forests during prolonged periods of drought combined with extreme heat, low relative humidity, and high wind. Tornadoes, high winds, wet snow and ice storms in recent years have placed a large amount of woody material on the forest floor that causes wildfires to burn hotter and longer. These conditions also make it more difficult for fire fighters suppress fires safely.

Often wildfires in Missouri go unnoticed by the general public because the sensational fire behavior that captures the attention of television viewers is rare in the state. Yet, from the standpoint of destroying homes and other property, Missouri wildfires can be quite destructive.

#### **Previous Occurrences**

According to MDC Wildfire Data, there have been 3,398 wildfires reported in Missouri from 2005 to 2018. A total of 8,459 acres were affected as a result of these reported wildfires. Vernon County has one had 278 wildfire reported from 2004-2016. Large and widespread wildfires, such as occur in the western United States, have not been a problem in Vernon County in recent history. However, the Fire Districts in Vernon County fight smaller wildfires/natural cover fires every year.

No schools or special districts in Vernon County reported any fire incidents that impacted their facilities.

#### Probability of Future Occurrence

According to the most recent state approved plan, a total of 7,872.96 acres burned in 278 events due to fire from 2004-2016 with an average of 606 average annual acreage burned in Vernon. This equates to a 100% probability of wildfire events in Vernon County in any given year or an average of 21 events per year. The majority of the cause was debris according to the MDC.

#### <u>Vulnerability</u>

#### Vulnerability Overview

Wildfires in Vernon County tend to be limited in their spatial extent thus minimizing their impact. According to the Missouri Department of Conservation, 49% of all wildfires in Missouri result from debris burning that gets out of hand and starts a wildfire. People and structures in the path of a wildfire are all at risk of minimum to extensive damage. Wildfires occur throughout wooded and open vegetation areas of Missouri. They can occur at any time of the year, but mostly occur during long, dry hot spells. Any small fire, if not quickly detected and suppressed, can get out of control.

Most wildfires are caused by human carelessness or negligence. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion. Structures and people in WUI areas in Vernon County are more vulnerable to the impact of wildfires due to the level of fuel mixed with structures.

The method used to determine vulnerability to wildfires fires in Vernon County was a comparative analysis of wildland urban interface and intermix (WUI) areas against building exposure data to determine the types, numbers, and estimated values of buildings at risk to wildfire.

Figure 3.10.

Likelihood of Wildfire Events, 2004-2016



# Potential Losses to Existing Development

There have been no wildfire reports for Vernon County since 2009, and there have been no known historical losses to estimate future losses. Currently, there is not a reliable or accurate way to estimate costs associated with a wildfire event.

To calculate estimated values of buildings at risk, buildings values available were used to determine an average value for each property type. This average value per property type was then applied to the number of structures in the WUI areas, by type, to calculate an overall estimated value of buildings at risk by type. In addition to counts and values of structures at risk, an estimated population impacted for Vernon County was calculated based on the number of residential properties in the WUI areas multiplied by the average household size. Figure 3.11 below provides the results of the wildfire analysis with the numbers and values of various types of structures, and population within the mapped WUI areas.

The estimated numbers and values of structures and population vulnerable to wildfire for Vernon County are as followed:

Structure Type	Number of Structures	Value of Structures	Population
Agriculture	226	\$143,305,871	1,210
Commercial	12	\$9,196,943	
Education	1	\$4,213,111	
Government	4	\$2,832,000	
Industrial	6	\$2,134,405	
Residential	482	\$90,994,423	

### Figure 3.11. Wildfire Urban Interface (WUI) Areas, 2010



#### Impact of Previous and Future Development

It is anticipated that there will be future development in WUI areas throughout unincorporated areas of the county. Future growth in WUI areas of the county will increase the risk and exposure to wildfires. It is expected that WUI development in cities will be mitigated by development regulations reducing the risk to wildfire hazard.

### Hazard Summary by Jurisdiction

The rural areas of Vernon County and the rural/urban interfaces are most at risk from wildfires. Debris burning is consistently the number one cause of wildfires in Missouri, and wildfires may also be a cascading or secondary impact of another hazard such as lightning or tornadoes, as a result of damaged gas and electrical lines. Fires caused by lightning are rare despite 50 to 70 thunderstorm days per year. With sufficient mutual aid, local fire services have adequate day-to-day fire service capabilities.

# Problem Statement

Wildfire occurrences are not frequent within Vernon County. Although, these events can destroy, damage and threaten structures in hazard prone areas. Populations and structures in WUI areas of the county have an increased risk to wildfires due to the level of fuel mixed with structures. Cities that have building codes or design requirements may also encourage non-combustible materials for new construction.

The unincorporated part of the county has the highest risk and exposure to wildfires. County officials and the fire department can promote fire resistant construction materials and landscape design techniques to mitigate the risk to wildfire in future development. Information about these materials and techniques are included in the MDC publication, *Living with Wildfire*. Including this information in education and awareness programs for the public may potentially mitigate wildfire damage in the county.

# 3.4.6 Flooding (Flash and River)

Some specific sources for this hazard are:

- Watershed map, Environmental Protection Agency, https://cfpub.epa.gov/surf/locate/index.cfm
- FEMA Map Service Center, Digital Flood Insurance Rate Maps (DFIRM) for all jurisdictions, if available, <u>msc.fema.gov/portal</u>
- NFIP Community Status Book, <u>http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book</u>
- NFIP claims status, BureauNet, <u>http://bsa.nfipstat.fema.gov/reports/reports.html</u>
- Flood Insurance Administration—Repetitive Loss List (this must be requested from the State Floodplain Management agency or FEMA)
- National Centers for Environmental Information, Storm Events Database, <u>http://www.NCEI.noaa.gov/stormevents/</u>
- USDA Risk Management Agency, Insurance Claims, <u>https://www.rma.usda.gov/data/cause</u>
- FEMA Data Visualization Tool, <u>https://www.fema.gov/data-visualization-floods-data-visualization</u>

# Hazard Profile

# Hazard Description

A flood is 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. There are several types of riverine floods, including headwater, backwater, interior drainage, and flash flooding. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt or ice melt. The areas adjacent to rivers and stream banks that

carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream. The terms "base flood" and "100- year flood" refer to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year. Floodplains are part of a larger entity called a basin, which is defined as all the land drained by a river and its branches.

Flooding caused by dam and levee failure is discussed and is not be addressed in this section.

A flash flood occurs when water levels rise at an extremely fast rate as a result of intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Flash flooding can happen in Special Flood Hazard Areas (SFHAs) as delineated by the National Flood Insurance Program (NFIP), and can also happen in areas not associated with floodplains.

Ice jam flooding is a form of flash flooding that occurs when ice breaks up in moving waterways, and then stacks on itself where channels narrow. This creates a natural dam, often causing flooding within minutes of the dam formation.

In some cases, flooding may not be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations – areas that are often not in a floodplain. This type of flooding, often referred to as sheet flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow.

Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding is a dangerous form of flooding which can reach full peak in only a few minutes. Rapid onset allows little or no time for protective measures. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding can result in higher loss of life, both human and animal, than slower developing river and stream flooding.

In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with rainfall trends and rainfall extremes all demonstrate the high probability, yet generally unpredictable nature of flash flooding in the planning area.

Although flash floods are somewhat unpredictable, there are factors that can point to the likelihood of flash floods occurring. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. This, along with knowledge of the watershed characteristics, modeling techniques, monitoring, and advanced warning systems has increased the warning time for flash floods.

#### **Geographic Location**

Riverine flooding is most likely to occur in Special Flood Hazard Areas (SFHAs) where the 100-year floodplain has been mapped. The entire planning is at high risk of ravine and levee flooding. From 1993 to 2017 Flooding has occurred in Vernon County in every year. While usually nuisance flooding such as water on city streets, significant flooding has caused numerous problems in the county. During the previous decade, only one injury and no deaths have been attributed to flooding in Vernon County. However, from 2015-2018 there was one death and no injuries due to flooding. Vernon County contains numerous low water crossings. Typically, flooding in the county is caused by heavy rainfall associated with high rain producing thunderstorms which move very slowly. In towns, rainfall

of one to two inches will cause streets and ditches to flood and make some low water crossings impassable. When rainfall rates reach 3 to 4 inches, major flooding can occur, and amounts over four inches creates significant flooding that affects most of the county.

Location	# of Events
Vernon County	2
City of Bronaugh	1
Village of Deerfield	5
Village of Metz	0
City of Nevada	0
City of Richards	0
City of Schell City	0
City of Sheldon	0
Village of Stotesbury	4
City of Walker	0

### Table 3.23 Vernon County NCEI Flood Events by Location, 2010-2018

Source: National Centers for Environmental Information

Figure 3.12. Vernon

**Vernon County Flood Zone** 







Figure 3.13. Bronaugh Flood Map

# Figure 3.14. Deerfield Flood Map

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# Figure 3.15. Metz Flood Map



# Figure 3.16.

### Nevada Flood Map with Zones





Figure 3.17.Nevada Flood Map Zone C0285C



Figure 3.18. Nevada Flood Map Zone C0282C



# Figure 3.19. Nevada Flood Map Zone 0301C

# Figure 3.20. Nevada Flood Map 0302C





Figure 3.21. Nevada Flood Map Zone 0303C

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# Figure 3.22. Nevada Flood Map Zone 0304C



Figure 3.23. Richards & Stotesbury Flood Map



# Figure 3.24. Schell City Flood Map



#### Figure 3.25. Sheldon Flood Map

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# Figure 3.26. Wal



Flash flooding occurs in SFHAs and those locations in the planning area that are low-lying. They also occur in areas without adequate drainage to carry away the amount of water that falls during intense rainfall events. The following table (**Table 3.24**) shows the number of flash flood events by location recorded by NCEI for the 23 year period.

11
0
1
0
8
4
0
0
3
0

#### Table 3.24. Vernon County NCEI Flash Flood Events by Location, 2010-2018

Source: National Centers for Environmental Information

The NCEI storm event data lists flash flood events according to the nearest community or place. Most of these events cover larger areas than the smaller geographic areas reported in the data. Some specific locations are listed within the narratives for flash flood events. Where specific roads and locations are listed they are provided in the table. Although some events may not be inside the corporate limits of the community identified in the narrative, they are in such proximity that the community named would be the most affected by impassible roads. It is safe to assume that numerous low water crossings would be impacted by heavy rains that exacerbate flash flooding across the county. In addition, multiple records are related to the same event and vice versa.

#### Severity/Magnitude/Extent

Missouri has a long and active history of flooding over the past century, according to the 2010 State Hazard Mitigation Plan. Flooding along Missouri's major rivers generally results in slow-moving disasters. River crest levels are forecast several days in advance, allowing communities downstream sufficient time to take protective measures, such as sandbagging and evacuations. Nevertheless, floods exact a heavy toll in terms of human suffering and losses to public and private property. By contrast, flash flood events in recent years have caused a higher number of deaths and major property damage in many areas of Missouri.

Flooding presents a danger to life and property, often resulting in injuries, and in some cases, fatalities. Floodwaters themselves can interact with hazardous materials. Hazardous materials stored in large containers could break loose or puncture as a result of flood activity. Examples are bulk propane tanks. When this happens, evacuation of citizens is necessary.

Public health concerns may result from flooding, requiring disease and injury surveillance. Community sanitation to evaluate flood-affected food supplies may also be necessary. Private water and sewage sanitation could be impacted, and vector control (for mosquitoes and other entomology concerns) may be necessary. When roads and bridges are inundated by water, damage can occur as the water scours materials around bridge abutments and gravel roads. Floodwaters can also cause erosion undermining road beds. In some instances, steep slopes that are saturated with water may cause mud or rock slides onto roadways. These damages can cause costly repairs for state, county, and city road and bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard.

#### National Flood Insurance Program (NFIP) Participation

**Table 3.25** provides details on NFIP participation for the communities in Vernon County.

Table 5.25. NETE Farticipation in Vernon County					
Community ID #	Community Name	NFIP Participant (Y/N)	Current Effective Map Date	Regular- Emergency Program Entry Date	
290841	Vernon County	Y	07/01/87	07/01/87	
290618	City of Bronaugh	Y	04/01/14	04/01/14	
290442	City of Nevada	Y	02/15/85	02/15/85	
290631	City of Walker	Y	NSFHA	09/10/84	
				1	

### Table 3.25. NFIP Participation in Vernon County

Source: NFIP Community Status Book, 9/26/2013; BureauNet, <u>http://www.fema.gov/national-flood-insurance-program-community-status-book</u>; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program

#### Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss Properties are those properties with at least two flood insurance payments of \$5,000 or more in a 10-year period. According to the Flood Insurance Administration, jurisdictions included in the planning area have a combined total of 2 repetitive loss residential properties.

**Severe Repetitive Loss (SRL):** A SRL property is defined it as a single family property (consisting of one-to-four residences) that is covered under flood insurance by the NFIP; and has (1) incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage with the amount of each claim payment exceeding \$5,000 and with cumulative amounts of such claims payments exceeding \$20,000; or (2) for which at least two separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

According to the current State Mitigation Plan Section 3.1, Vernon County has no Severe Repetitive Loss Properties or Mitigation Severe Repetitive Loss Properties, and one Mitigated Repetitive Loss Property, and two Repetitive Loss Properties of which are residential structures. The total payment for non-mitigated repetitive loss properties is \$24,035.08, and the total payment for mitigated repetitive loss properties is \$7,867.37.

#### **Previous Occurrences**

Since 1995, there have been seven (7) presidential flooding disaster declarations that include the planning area. All flooding events were associated with severe storms.

Declared on June 1, 1995	Severe Storms, Tornadoes, Hail, Flooding				
Declared on May 5, 2003	Severe Storms, Tornadoes, Flooding				
Declared on June 10, 2004	Severe Storms, Tornadoes, Flooding				
Declared on March 15, 2006	Severe Storms, Tornadoes, Flooding				
	Declared on June 1, 1995 Declared on May 5, 2003 Declared on June 10, 2004 Declared on March 15, 2006				
DR-1749	Declared on March 18, 2008	Severe Storms, Flooding			
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DR-1773	Declared on June 24, 2008	Severe Storms, Flooding			
DR-1847	Declared on June 18, 2009	Severe Storms, Tornadoes, Flooding			
DR-779	Declared 1986	Severe Storms, Flooding			
DR-995	Declared 1993	Severe Storms, Flooding			
<b>Table 3.25</b> shows Flash Flood events for Vernon County from 1995-2018 (Tables 3.25).					

Table 3.26.	NCEI Vernon	County	Flash	Flood	Events	Summary,	1995	to 2	2015
-------------	-------------	--------	-------	-------	--------	----------	------	------	------

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
1996	1	0	0	0	0
1997	1	0	0	0	0
1997	1	0	0	0	0
1997	1	0	0	0	0
1997	1	0	0	0	0
1997	1	0	0	0	0
1998	1	0	0	0	0
1998	1	0	0	0	0
1998	1	0	0	0	0
1998	1	0	0	0	0
1999	1	0	0	0	0
1999	1	0	0	0	0
1999	1	0	0	0	0
1999	1	0	0	0	0
2000	1	0	0	0	0
2000	1	0	0	0	0
2001	1	0	0	0	0
2001	1	0	0	0	0
2001	1	0	0	0	0
2002	1	0	0	0	0
2002	1	0	0	0	0
2005	1	0	0	0	0
2005	1	0	0	0	0
2005	1	0	0	0	0
2005	1	0	0	0	0
2006	1	0	0	0	0
2007	1	0	0	0	0
2007	1	0	0	0	0
2007	1	0	0	0	0
2007	1	0	0	0	0
2008	1	0	0	0	0
2008	1	0	0	0	0
2008	1	0	0	0	0
2008	1	0	0	0	0
2008	1	0	0	0	0
2008	1	0	0	0	0
2009	1	0	0	0	0
2009	1	0	0	0	0
2009	1	0	0	0	0
2009	1	0	0	0	0
2009	1	0	0	0	0
2009	1	0	0	0	0
2010	1	0	0	0	0
2010	1	0	0	0	0
2010	1	0	0	0	0
2010	1	0	0	0	0
2010	1	0	0	\$2,000	0

2010	1	0	0	0	0
2010	1	0	0	\$20,000	0
2010	1	0	0	0	0
2012	1	0	0	0	0
2012	1	0	0	0	0
2012	1	0	0	0	0
2012	1	0	0	\$5,000	0
2012	1	0	0	0	0
2012	1	0	0	0	0
2012	1	0	0	0	0
2012	1	0	0	0	0
2013	1	0	0	0	0
2013	1	0	0	0	0
2013	1	0	0	0	0
2013	1	0	0	0	0
2013	1	0	0	\$5,000	0
2013	1	0	0	0	0
2015	1	0	0	0	0
2017	1	0	0	0	0
2017	1	0	0	0	0
2017	1	0	0	0	0
2017	1	0	0	0	0

Source: NCEI, data accessed [3/14/18]

#### Table 3.27. NCEI Vernon Riverine Flood Events Summary, 1995 to 2018

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
	0	0	0	0	0
Source: NCEL data	accossed [insort date]				

Source: NCEI, data accessed [insert date]

No Riverine Flood Events occurred in Vernon County from 1995-2018.

#### Probability of Future Occurrence

Based on previous events, flash flooding will occur in Vernon County on average 3.38 times annually. This number shows that Vernon County on average has three to four flash flooding events within the county each year. Riverine flooding will occur in Vernon County less than 0.01 times annually. This number shows that Vernon County on average will have less than one event of riverine flooding per year within the county based on the 1% annual chance base flood event.

#### **Vulnerability**

#### Vulnerability Overview

Flooding has been included in most of the presidential disaster declarations that have include Vernon County. Periods of heavy rain falling at the rate of one inch per hour floods low water crossings throughout the county making many roads impassable. This creates a severe threat to motorists that attempt to drive through flood waters over the roadway. Riverine flooding occurs less frequently than flash flooding and there are two repetitive loss properties in the county. However, property damage is still likely to occur to non-SRL properties. Areas in low lying areas outside of the floodplain may also be frequently flooded. Flooding of streets has been reported in several of the communities and many highways are frequently being flooded. Increases in development add to surface runoff and can exacerbate flash flooding in areas that previously have not experienced flooding.

#### Potential Losses to Existing Development

All public school districts structures in Vernon County are possibly vulnerable to the effects of this hazard. While riverine flooding does not pose a direct threat to educational and other jurisdictions there is a low, indirect threat to access of structures and to populations during times of flash flooding. Other structures not within designated floodplains are also vulnerable to the effects of flash flooding brought on by storm water or sheet flooding.

#### Impact of Previous and Future Development

Future development could impact flash and riverine flooding in Vernon County. Development in low-lying areas near rivers and streams or where interior drainage systems are not adequate to provide drainage during heavy rainfall events will be at risk to flash flooding. Impact of previous and future development is directly related to floodplain management and regulations set forth by the County and individual communities. Currently, there is no knowledge of any future development by any public school districts that would be vulnerable to this hazard. It's noted however, that future development would increase impervious surfaces causing additional water run-off and drainage problems during heavy rainfall events.

#### Hazard Summary by Jurisdiction

All local governments and school districts in the county are not equally at risk to flood hazards. Vernon County is more vulnerable to flash flooding than to riverine flooding, but both types are possibilities. Due to close proximity to Katy Allen Lake, if the levee breaks or flash flooding occurs on either side of the dam, the City of Nevada and the Nevada School District would be affected. Flooding will usually occur in the late spring and fall and once the rivers are full, locals can expect to see streams and other small tributaries back up. Most of the flood areas are located outside the city limits and away from critical structures.

The Flood Insurance Rate Map for Vernon County Shows the possible flood zones for this jurisdiction at great risk. The greatest impact of flooding is in the unincorporated part of the county. Often, one of the largest issues is the amount of debris left over after a flood event. Due to the topography and many streams in the county, numerous low water crossings can be damaged and create a significant hazard to public safety during flood events. There are no school facilities in SFHAs and no previous damages were reported on the Data Collection Questionnaire for schools. However, flooding is still a risk and several incorporated areas, including the school districts in the county, are susceptible to street flooding during periods of heaving rain.

Sac Osage Electric Cooperative's substations are the elements most vulnerable to flooding. Flooding damages ground-level substation control equipment and low-voltage switchgear. High voltage components, including insulators, circuit breakers, air-break switches, transformers, deadend towers, lightning arrestors, and metering transformers are situation high aboveground to use air space for voltage power systems components. Facilities located in areas with more than four feet of floodwater will likely be out of service and could sustain damage to transformers and circuit breakers. If floodwaters do not damage the transmission and distribution systems, then crews can restore these systems shortly after the floodwaters recede.

#### **Problem Statement**

Floods are frequent events and have been listed in the presidential disaster declarations that have included Vernon County. Vernon County is a participant in the NFIP along with the larger jurisdictions

in the County. Participation in the NFIP enables residents to purchase flood insurance. Street flooding in incorporated areas can be addressed through storm water management projects and enforce storm water management regulations.

Property damage has resulted in some flood events in the past two decades. To reduce the damage of floods to infrastructure and human life, several strategies can be implemented, such as hazard awareness programs and waterway maintenance. Additionally, based on survey responses, additional education on the value of flood insurance may be necessary. Signage of flood prone areas should also be maintained and made visible to everyone. Projects involving the improvements to river/stream embankments can also reduce flooding to surrounding areas.

# 3.4.7 Land Subsidence/Sinkholes

Some specific sources for this hazard are:

- <u>http://www.dnr.mo.gov/geology/geosrv/envgeo/sinkholes.htm</u> <u>http://strangesounds.org/2013/07/us-sinkhole-map-these-maps-show-that-around-40-of-the-u-s-lies-in-areas-prone-to-sinkholes.html</u>
- http://www.businessinsider.com/where-youll-be-swallowed-by-a-sinkhole-2013-3
- <u>http://water.usgs.gov/edu/sinkholes.html</u>
- http://pubs.usgs.gov/fs/2007/3060/

#### Hazard Profile

#### Hazard Description

Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that naturally can be dissolved by ground water circulating through them. As the rock dissolves, spaces and caverns develop underground. The sudden collapse of the land surface above them can be dramatic and range in size from broad, regional lowering of the land surface to localized collapse. However, the primary causes of most subsidence are human activities: underground mining of coal, groundwater or petroleum withdrawal, and drainage of organic soils. In addition, sinkholes can develop as a result of subsurface void spaces created over time due to the erosion of subsurface limestone (karst).

Land subsidence occurs slowly and continuously over time, as a general rule. On occasion, it can occur abruptly, as in the sudden formation of sinkholes. Sinkhole formation can be aggravated by flooding.

In the case of sinkholes, the rock below the surface is rock that has been dissolving by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapse. In Missouri, sinkhole problems are usually a result of surface materials above openings into bedrock caves eroding and collapsing into the cave opening. 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.

According to the U.S. Geological Survey (USGS), the most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. Fifty-nine percent of Missouri is underlain by thick, carbonate rock that makes Missouri vulnerable to sinkholes. Sinkholes occur in Missouri on a fairly frequent basis. Most of Missouri's sinkholes occur naturally in the State's karst regions (areas with soluble bedrock). They are a common geologic hazard in southern Missouri, but also occur in the central and northeastern parts of the State. Missouri sinkholes have varied from a few feet to hundreds of acres and from less than one to more than 100 feet deep. The largest known sinkhole in Missouri encompasses about 700 acres in western Boone County southeast of where Interstate 70 crosses the Missouri River. Sinkholes can also vary is shape like shallow bowls or saucers whereas other have vertical walls. Some hold water and form natural ponds.

#### **Geographic Location**

The current Missouri State Plan shows that Vernon County has no sinkholes. The following map shows the sinkhole locations.



#### Severity/Magnitude/Extent

Sinkholes vary in size and location, and these variances will determine the impact of the hazard. A sinkhole could result in the loss of a personal vehicle, a building collapse, or damage to infrastructure such as roads, water, or sewer lines. Groundwater contamination is also possible from a sinkhole. Because of the relationship of sinkholes to groundwater, pollutants captured or dumped in sinkholes could affect a community's groundwater system. Sinkhole collapse could be triggered by large earthquakes. Sinkholes located in floodplains can absorb floodwaters but make detailed flood hazard studies difficult to model.

The 2013 State Plan included only seven documented sinkhole "notable events". The plan stated that sinkholes are common to Missouri and the probability is high that they will occur in the future. To date, Missouri sinkholes have historically not had major impacts on development nor have they caused serious damage. Thus, the severity of future events is likely to be low.

#### **Previous Occurrences**

A comment in the 2013 State Plan states that sinkholes are a regular occurrence in Missouri, but that they are rarely events of any significance. On page 3.225 and 3.226 of the state plan are some notable events. Vernon County currently has 0 recorded sinkholes and 191 mines.

#### **Probability of Future Occurrence**

Sinkhole incidents are not tracked by the NCEI, and MDNR data was unavailable, so it is difficult to calculate a future probability of occurrence. However, there is a low probability, in any given year, that there may be new sinkholes in Vernon County in the years to come.

#### **Vulnerability**

#### Vulnerability Overview

There are no significant sinkhole reports within Vernon County.

#### Potential Losses to Existing Development

Currently there is no threat of potential loss to existing development in Vernon County from a sinkhole.

#### Impact of Previous and Future Development

Future development over abandoned mines and in areas of known risk to sinkhole formation in Vernon County will increase vulnerability to this hazard. Population and development in these areas will increase exposure to sinkhole occurrence. There are currently no regulations prohibiting construction over or near known sinkholes. Future development may also change storm runoff patterns and cause expansion or formation of sinkholes.

#### Hazard Summary by Jurisdiction

According to the current Missouri State Plan, page 3.228, Vernon County has a low rating value for sinkholes. There are no recorded reports of significant sinkholes or damage caused by sinkholes, with in Vernon County.

#### Problem Statement

There is currently low risk of sinkholes or sinkhole events in Vernon County because of the 0 recorded sinkhole events within the County. There are no strategies to plan for sinkhole incidents within Vernon County.

Sinkhole formation in urban areas compared to rural areas has the potential to be expedited due to human interaction with the subsurface through construction of facilities and infrastructure. Natural drainage patterns are altered, which can increase water volume and flow to areas more susceptible to sinkhole formation, thus increasing the potential for mobilization of sediment in the subsurface or increasing amount of dissolution of the underlying bedrock. A secondary problem that can arise once sinkhole formation has already occurred is flooding. During periods of excessive rainfall in the watershed of an existing sinkhole can cause water levels to rise faster than it can infiltrate into the ground through the soil of the sinkhole. When this happens, water can temporarily "back-up" to fill the sinkhole and may even "spill-over" into surrounding low-lying areas. In some cases, homes with "walk- out" basements are built along the sides of a sinkhole and, in those cases, the walk-out basement may become the low-lying "spill-over" area.

It is likely that more sinkholes will occur as development increases within the county. Sinkholes can be remediated with fill material. Once a sinkhole has been remediated, building should be prohibited at the site. Existing sinkholes can expand if surface runoff erodes the edges of the sinkhole. Storm water; runoff should be diverted away from known sinkholes. Jurisdictions may adopt regulations

prohibiting construction at least 30 feet from known sinkholes. Information about identifying potential sinkhole formation and promoting Missouri FAIR plan sinkhole insurance can be included in public outreach and hazard awareness programs. Undeveloped land that is in a sinkhole risk area can be used for park space or other recreational purposes.

## 3.4.8 Levee Failure

Some sources of data for this hazard include:

- National Levee Database, <u>http://nld.usace.army.mil/egis/f?p=471:1:0::NO</u>
- FEMA Map Service Center for Flood Insurance Rate Maps and Flood Insurance Studies, msc.fema.gov/portal
- <u>https://www.fema.gov/fema-levee-resources-library</u>

#### Hazard Profile

#### Hazard Description

Levees are earth embankments constructed along rivers and coastlines to protect adjacent lands from flooding. Floodwalls are concrete structures, often components of levee systems, designed for urban areas where there is insufficient room for earthen levees. When levees and floodwalls and their appurtenant structures are stressed beyond their capabilities to withstand floods, levee failure can result in injuries and loss of life, as well as damages to property, the environment, and the economy.

Levees can be small agricultural levees that protect farmland from high-frequency flooding. Levees can also be larger, designed to protect people and property in larger urban areas from less frequent flooding events such as the 100-year and 500-year flood levels. For purposes of this discussion, levee failure will refer to both overtopping and breach as defined in FEMA's Publication "So You Live Behind a Levee" (<u>http://content.asce.org/ASCELeveeGuide.html</u> http://mrcc.isws.illinois.edu/1913Flood/awareness/materials/SoYouLiveBehindLevee.pdf). Following

are the FEMA publication descriptions of different kinds of levee failure.

#### Overtopping: When a Flood Is Too Big

Overtopping occurs when floodwaters exceed the height of a levee and flow over its crown. As the water passes over the top, it may erode the levee, worsening the flooding and potentially causing an opening, or breach, in the levee.

#### Breaching: When a Levee Gives Way

A levee breach occurs when part of a levee gives way, creating an opening through which floodwaters may pass. A breach may occur gradually or suddenly. The most dangerous breaches happen quickly during periods of high water. The resulting torrent can quickly swamp a large area behind the failed levee with little or no warning.

Earthen levees can be damaged in several ways. For instance, strong river currents and waves can erode the surface. Debris and ice carried by floodwaters—and even large objects such as boats or barges—can collide with and gouge the levee. Trees growing on a levee can blow over, leaving a hole where the root wad and soil used to be. Burrowing animals can create holes that enable water to pass through a levee. If severe enough, any of these situations can lead to a zone of weakness that could cause a levee breach. In seismically active areas, earthquakes and ground shaking can cause a loss of soil strength, weakening a levee and possibly resulting in failure. Seismic activity can also cause

levees to slide or slump, both of which can lead to failure.

#### **Geographic Location**

Missouri is a state with many levees. Currently, there is no single comprehensive inventory of levee systems in the state. Levees have been constructed across the state by public entities and private entities with varying levels of protection, inspection oversight, and maintenance. The lack of a comprehensive levee inventory is not unique to Missouri.

There are two concurrent nation-wide levee inventory development efforts, one led by the United State Army Corps of Engineers (USACE) and one led by Federal Emergency Management Agency (FEMA). The National Levee Database (NLD), developed by USACE, captures all USACE related levee projects, regardless of design levels of protection. The Midterm Levee Inventory (MLI), developed by FEMA, captures all levee data (USACE and non-USACE) but primarily focuses on levees that provide 1% annual-chance flood protection on FEMA Flood Insurance Rate Maps (FIRMs).

It is likely that agricultural levees and other non-regulated levees within the planning area exist that are not inventoried or inspected. These levees that are not designed to provide protection from the 1percent annual chance flood would overtop or fail in the 1-percent annual chance flood scenario. Therefore, any associated losses would be taken into account in the loss estimates provided in the Flood Hazard Section.

There are no Vernon County levees in the National Levee Database (NLD) maintained by the USACE.

#### Severity/Magnitude/Extent

Levee failure is typically an additional or secondary impact of another disaster such as flooding or earthquake. The main difference between levee failure and losses associated with riverine flooding is magnitude. Levee failure often occurs during a flood event, causing destruction in addition to what would have been caused by flooding alone. In addition, there would be an increased potential for loss of life due to the speed of onset and greater depth, extent, and velocity of flooding due to levee breach.

As previously mentioned, agricultural levees and levees that are not designed to provide flood protection from at least the 1-percent annual chance flood likely do exist in the planning area. However, none of these levees are shown on the Preliminary DFIRM, nor are they enrolled in the USACE Levee Safety Program. As a result, an inventory of these types of levees is not available for analysis. Additionally, since these types of levees do not provide protection from the 1-percent annual chance flood, losses associated with overtopping or failure are captured in the Flood Section of this plan.

The USACE regularly inspects levees within its Levee Safety Program to monitor their overall condition, identify deficiencies, verify that maintenance is taking place, determine eligibility for federal rehabilitation assistance (in accordance with P.L. 84-99), and provide information about the levees on which the public relies. Inspection information also contributes to effective risk assessments and supports levee accreditation decisions for the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA).

The USACE now conducts two types of levee inspections. Routine Inspection is a visual inspection to verify and rate levee system operation and maintenance. It is typically conducted each year for all

levees in the USACE Levee Safety Program. Periodic Inspection is a comprehensive inspection led by a professional engineer and conducted by a USACE multidisciplinary team that includes the levee sponsor. The USACE typically conducts this inspection every five years on the federally authorized levees in the USACE Levee Safety Program.

Both Routine and Periodic Inspections result in a rating for operation and maintenance. Each levee segment receives an overall segment inspection rating of Acceptable, Minimally Acceptable, or Unacceptable. **Figure 3.24** below defines the three ratings.

#### Figure 3.27. Definitions of the Three Levee System Ratings

Levee System Inspection Ratings					
Acceptable	All inspection items are rated as Acceptable.				
Minimally Acceptable	One or more levee segment inspection items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and an engineering determination concludes that the Unacceptable inspection items would not prevent the segment/system from performing as intended during the next flood event.				
Unacceptable	One or more levee segment inspection items are rated as Unacceptable and would prevent the segment/system from performing as intended, or a serious deficiency noted in past inspections (previous Unacceptable items in a Minimally Acceptable overall rating) has not been corrected within the established timeframe, not to exceed two years.				

#### Previous Occurrences

There is not a record of levee breaches of any kind the planning area.

#### Probability of Future Occurrence

Probability: Low—Bronaugh, Deerfield, Metz, Nevada, Richards, Schell City, Sheldon, Stotesbury, Walker, Bronaugh R-VIII School District, Nevada R-V School District, Sheldon R-VIII School District, unincorporated Vernon County.

Severity: Low—Bronaugh, Deerfield, Metz, Nevada, Richards, Schell City, Sheldon, Stotesbury, Walker, Bronaugh R-VIII School District, Nevada R-V School District, Sheldon R-VIII School District, unincorporated Vernon County.

#### <u>Vulnerability</u>

#### Vulnerability Overview

There is no chance for Vernon County to be vulnerable because there are no levees located within the county.

#### Potential Losses to Existing Development

There is no chance for Vernon County to incur potential losses to existing development because there are no levees located within the county.

#### Impact of Previous and Future Development

There will be no impact on future development within Vernon County because there are no levees located in Vernon County.

#### Hazard Summary by Jurisdiction

There are no communities with levee protected areas because there are no levees located within Vernon County.

#### Problem Statement

There is currently no risk from levee breaches or levee failure events in Vernon County because the County does not have any levees within the county. There are no strategies to plan for levee breach incidents within Vernon County.

# 3.4.9 Thunderstorm/High Winds/Lightning/Hail

Some Specific Sources for this hazard are:

- FEMA 320, Taking Shelter from the Storm, 3rd edition, <u>http://www.weather.gov/media/bis/FEMA\_SafeRoom.pdf</u>
- Lightning Map, National Weather Service, <u>http://www.vaisala.com/en/products/thunderstormandlightningdetectionsystems/Pages/NLDN.asp</u>
   <u>x</u>
- Death and injury statistics from lightning strikes, National Weather Service.
- Wind Zones in the U.S. map, FEMA, <a href="https://www.fema.gov/pdf/library/ism2\_s1.pdf">https://www.fema.gov/pdf/library/ism2\_s1.pdf</a> ;
- Annual Windstorm Probability (65+knots) map U.S. 1980-1994, NSSL, http://www.nssl.noaa.gov/users/brooks/public\_html/bigwind.gif
- Hailstorm intensity scale, The Tornado and Storm Research Organization (TORRO), <u>http://www.torro.org.uk/site/hscale.php;</u>
- NCEI data;
- USDA Risk Management Agency, Insurance Claims, https://www.rma.usda.gov/data/cause
- National Severe Storms Laboratory hail map, http://www.nssl.noaa.gov/users/brooks/public html/bighail.gif

#### Hazard Profile

#### Hazard Description

#### Thunderstorms

A thunderstorm is defined as a storm that contains lightning and thunder which is caused by unstable atmospheric conditions. When cold upper air sinks and warm moist air rises, storm clouds or 'thunderheads' develop resulting in thunderstorms. This can occur singularly, as well as in clusters or lines. The National Weather Service defines a thunderstorm as "severe" if it includes hail that is one inch or more, or wind gusts that are at 58 miles per hour or higher. At any given moment

across the world, there are about 1,800 thunderstorms occurring. Severe thunderstorms most often occur in Missouri in the spring and summer, during the afternoon and evenings, but can occur at any time. Other hazards associated with thunderstorms are heavy rains resulting in flooding.

#### High Winds

A severe thunderstorm can produce winds causing as much damage as a weak tornado. The damaging winds of thunderstorms include downbursts, microbursts, and straight-line winds. Downbursts are localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground. Microbursts are minimized downbursts covering an area of less than 2.5 miles across. They include a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Microbursts may or may not include precipitation and can produce winds at speeds of more than 150 miles per hour. Damaging straight-line winds are high winds across a wide area that can reach speeds of 140 miles per hour.

#### Lightning

All thunderstorms produce lightning which can strike outside of the area where it is raining and is has been known to fall more than 10 miles away from the rainfall area. Thunder is simply the sound that lightning makes. Lightning is a huge discharge of electricity that shoots through the air causing vibrations and creating the sound of thunder.

#### Hail

According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when thunderstorm updrafts carry raindrops upward into extremely cold atmosphere causing them to freeze. The raindrops form into small frozen droplets. They continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen droplet can continue to grow and form hail. As long as the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow before it hits the earth.

At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 miles per hour. According to the NOAA, the largest hailstone in diameter recorded in the United States was found in Vivian, South Dakota on July 23, 2010. It was eight inches in diameter, almost the size of a soccer ball. Soccer-ball-sized hail is the exception, but even small pea-sized hail can do damage.

#### Geographic Location

Thunderstorms/high winds/hail/lightning events are an area-wide hazard that can happen anywhere in the county. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed urban areas.

The Map (**Figure 3.25**) shows lightning frequency in the entire United States. The flash density of Vernon County is 4 to 5 which states that every year 4 to 5 occurrences of lightning happen within the county.



Figure 3.28.

Location and Frequency of Lightning in Missouri

Source: National Weather Service, <u>http://www.vaisala.com/en/products/thunderstormandlightningdetectionsystems/Pages/NLDN</u>

<u>.aspx</u>. Note: indicate location of planning area with a colored square or arrow.

(Figure 3.26) shows wind zones in the United States. Vernon County is located in Zone IV.

Figure 3.29. Wind Zones in the United States



Source: FEMA 320, Taking Shelter from the Storm, 3rd edition, https://www.fema.gov/pdf/library/ism2\_s1.pdf

#### Severity/Magnitude/Extent

Severe thunderstorm losses are usually attributed to the associated hazards of hail, downburst winds, lightning and heavy rains. Losses due to hail and high wind are typically insured losses that are localized and do not result in presidential disaster declarations. However, in some cases, impacts are severe and widespread and assistance outside state capabilities is necessary. Hail and wind also can have devastating impacts on crops. Severe thunderstorms/heavy rains that lead to flooding are discussed in the flooding hazard profile. Hailstorms cause damage to property, crops, and the environment, and can injure and even kill livestock. In the United States, hail causes more than \$1 billion in damage to property and crops each year. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are also commonly damaged by hail. Hail has been known to cause injury to humans, occasionally fatal injury.

In general, assets in the County vulnerable to thunderstorms with lightning, high winds, and hail include people, crops, vehicles, and built structures. Although this hazard results in high annual

losses, private property insurance and crop insurance usually cover the majority of losses. Considering insurance coverage as a recovery capability, the overall impact on jurisdictions is reduced.

Most lightning damages occur to electronic equipment located inside buildings. But structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damages to crops if fields or forested lands are set on fire. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes. <u>http://www.vaisala.com/en/products/thunderstormandlightningdetectionsystems/Pages/NLDN.aspx</u> and <u>http://www.lightningsafety.noaa.gov/</u>

Based on information provided by the Tornado and Storm Research Organization (TORRO), **Table 3.288** below describes typical damage impacts of the various sizes of hail.

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	31-40	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange <ul> <li>Soft ball</li> </ul>	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

#### Table 3.28. Tornado and Storm Research Organization Hailstorm Intensity Scale

Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University Notes: In addition to hail diameter, factors including number and density of hailstones, hail fall speed and surface wind speeds affect severity. <u>http://www.torro.org.uk/site/hscale.php</u>

Straight-line winds are defined as any thunderstorm wind that is not associated with rotation (i.e., is not a tornado). It is these winds, which can exceed 100 miles per hour, which represent the most common type of severe weather. They are responsible for most wind damage related to thunderstorms. Since thunderstorms do not have narrow tracks like tornadoes, the associated wind damage can be extensive and affect entire (and multiple) counties. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase.

The **Table 3.28** summarizes past crop damages as indicated by crop insurance claims. The tables illustrate the magnitude of the impact on the planning area's agricultural economy.

# Table 3.29. Crop Insurance Claims Paid in Vernon County from Thunderstorms that caused excess rainfall or moisture 2014-2018.

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid \$
2014	WHEAT	Excess Moisture	475.32
2014	WHEAT	Excess Moisture	1252.71
2014	WHEAT	Excess Moisture	511.37
2014	WHEAT	Excess Moisture	3026.05
2014	WHEAT	Excess Moisture	3505.37
2014	CORN	Excess Moisture	19.82
2014	GRAIN SORGHUM	Excess Moisture	20.4
2014	GRAIN SORGHUM	Excess Moisture	76.13
2014	GRAIN SORGHUM	Excess Moisture	87.81
2014	SOYBEANS	Excess Moisture	614.04
2014	SOYBEANS	Excess Moisture	50.07
2014	SOYBEANS	Excess Moisture	76.10
2014	SOYBEANS	Excess Moisture	113.58
2014	SOYBEANS	Excess Moisture	157.92
2014	WHEAT	Excess Moisture	475.32
2014	WHEAT	Excess Moisture	1252.71
2014	WHEAT	Excess Moisture	511.37
2014	WHEAT	Excess Moisture	3026.05
2015	WHFAT	Excess Moisture	25.3413
2015	WHEAT	Excess Moisture	139.48
2015	WHEAT	Excess Moisture	6619.08
2015	WHEAT	Excess Moisture	2043.78
2015	WHEAT	Excess Moisture	7718.66
2015	WHEAT	Excess Moisture	1383.66
2015	COBN	Excess Moisture	1185 53
2015	CORN	Excess Moisture	78.98
2015	COBN	Excess Moisture	911 13
2015	COBN	Excess Moisture	84 64
2015	CORN	Excess Moisture	1887.98
2015	COBN	Excess Moisture	2419.09
2015	CORN	Excess Moisture	69.00
2015	COBN	Excess Moisture	12897 77
2015	CORN	Excess Moisture	13.65
2015	GRAIN SORGHUM	Excess Moisture	136.50
2015	GRAIN SORGHUM	Excess Moisture	31.60
2015	GRAIN SORGHUM	Excess Moisture	450.22
2015	GRAIN SORGHUM	Excess Moisture	279.91
2015	GRAIN SORGHUM	Excess Moisture	137.09
2015	GRAIN SORGHUM	Excess Moisture	90.00
2015	GRAIN SORGHUM	Excess Moisture	11 58
2015	SOYBEANS	Excess Moisture	246.60
2015	SOYBEANS	Excess Moisture	10622 55
2015	SOYBEANS	Excess Moisture	8438.09
2015	SOVBEANS	Excess Moisture	696.84
2015	SOVBEANS	Excess Moisture	74.40
2015	SOVBEANS	Excess Moisture	1052 11
2015	SOVBEANS	Excess Moisture	25 25
2015	SOVBEANS	Excess Moisture	12701 //2
2016	WHEAT	Excess Moisture	278 10
2016	WHFAT	Excess Moisture	81 40

2016	WHEAT	Excess Moisture	253.7
2016	WHEAT	Excess Moisture	385.67
2016	CORN	Excess Moisture	285.50
2016	CORN	Excess Moisture	146.43
2016	CORN	Excess Moisture	1606.50
2016	GRAIN SORGHUM	Excess Moisture	207.35
2016	SOYBEANS	Excess Moisture	193.50
2016	SOYBEANS	Excess Moisture	95.10
2016	SOYBEANS	Excess Moisture	166.56
2016	SOYBEANS	Excess Moisture	23.00
2016	SOYBEANS	Excess Moisture	2008.68
2016	SOYBEANS	Excess Moisture	843.66
2016	SOYBEANS	Excess Moisture	44.32
2017	WHEAT	Excess Moisture	1054.73
2017	WHEAT	Excess Moisture	194.50
2017	WHEAT	Excess Moisture	2896.92
2017	WHEAT	Excess Moisture	74.18
2017	OATS	Excess Moisture	24.70
2017	CORN	Excess Moisture	16109.97
2017	CORN	Excess Moisture	3321.21
2017	CORN	Excess Moisture	4787.49
2017	CORN	Excess Moisture	25.57
2017	CORN	Excess Moisture	93.44
2017	CORN	Excess Moisture	30.19
2017	CORN	Excess Moisture	80.00
2017	CORN	Excess Moisture	1775.20
2017	CORN	Excess Moisture	797.60
2017	SOYBEANS	Excess Moisture	136.66
2017	SOYBEANS	Excess Moisture	88.90
2017	SOYBEANS	Excess Moisture	234.65
2017	SOYBEANS	Excess Moisture	4970.30
2017	SOYBEANS	Excess Moisture	20477.04
2017	SOYBEANS	Excess Moisture	372.08
2017	SOYBEANS	Excess Moisture	503.47
2017	SOYBEANS	Excess Moisture	235.40
2017	SOYBEANS	Excess Moisture	5.97
2017	SOYBEANS	Excess Moisture	556.65
2018	WHEAT	Excess Moisture	218.07
2018	WHEAT	Excess Moisture	1396.98
2018	WHEAT	Excess Moisture	11365.36
2018	WHEAT	Excess Moisture	1900.17
2018	WHEAT	Excess Moisture	37.69
2018	WHEAT	Excess Moisture	57.92
2018	CORN	Excess Moisture	63.95
2018	CORN	Excess Moisture	46.49
2018	CORN	Excess Moisture	200.20
2018	CORN	Excess Moisture	258.43
2018	SOYBEANS	Excess Moisture	319.73
2018	SOYBEANS	Excess Moisture	552.95
2018	SOYBEANS	Excess Moisture	6454.58
2018	SOYBEANS	Excess Moisture	72.00
2018	SOYBEANS	Excess Moisture	35.46
Total			\$177.180.50

Source: USDA Risk Management Agency, Insurance Claims, https://www.rma.usda.gov/data/cause

The onset of thunderstorms with lightning, high wind, and hail is generally rapid. Duration is less than six hours and warning time is generally six to twelve hours. Nationwide, lightning kills 75 to 100 people each year. Lightning strikes can also start structural and wildland fires, as well as damage electrical systems and equipment.

#### **Previous Occurrences**

The following tables list previous occurrences of lightning strikes, hail, and thunderstorm winds within Vernon County over the course of the past six years. There are limitations to the use of NCEI data whereas not all events are reported if there are not any casualties or significant damages to property or crops.

#### **Lightning Strike**

There were no reported lightning strike events in Vernon County from 2013-2018

Table 3.29 (Hail)	
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Date	Injuries	Fatalities	Damages
2013	0	0	0
2013	0	0	\$500.000
2013	0	0	0
2013	0	0	0
2014	0	0	0
2014	0	0	0
2014	0	0	0
2015	0	0	0
2015	0	0	0
2015	0	0	0
2015	0	0	0
2016	0	0	0
2016	0	0	0
2016	0	0	0
2016	0	0	0
2016	0	0	0
2017	0	0	0
2017	0	0	0
2017	0	0	0
2017	0	0	0
2018	0	0	0
2017	0	0	0
2017	0	0	0
2017	0	0	0
2017	0	0	0
2017	0	0	50,000
2017	0	0	0
2017	0	0	0
2018	0	0	0
2018	0	0	0
2018	0	0	0
Total	0	0	550,000

Date	Injuries	Fatalities	Damages
2013	0	0	\$10,000
2014	0	0	\$25,000
2015	0	0	\$10,000
2015	0	0	\$50,000
2015	0	0	\$25,000
2016	0	0	\$10,000
2017	0	0	\$10,000
Total	0	0	\$140,000

#### Table 3.30 (Thunderstorm wind damage \$10,000 and over) 2013-2018

#### Probability of Future Occurrence

According to the most recent state plan, Vernon County has had a total of 137 high wind events with a 100% likelihood of occurrence; a total of 146 hail events with a 100% likelihood of occurrence, and 1 lightning event with a 4.8% likelihood of occurrence. Due to previous occurrences, Vernon County has a 100% chance that an event will occur during the year. According to page 3.298 of the state plan, Vernon County has a Medium-High vulnerability rating for thunderstorms.

**Figure 3.27** is based on hailstorm data from 1980-1994. It shows the probability of hailstorm occurrence (2" diameter or larger) based on number of days per year. Vernon County is located in zone 1.25 which states that the average annual hailstorm will create hail that is approximately 1.25 inches in diameter.



#### Figure 3.30. Annual Hailstorm Probability (2" diameter or larger), U 1980- 1994

### <u>Vulnerability</u>

#### **Vulnerability Overview**

All jurisdictions in Vernon County are vulnerable to the effects of thunderstorms. All above ground structures are vulnerable to the effects of thunderstorms and all other hazards associated with them (hail, rain, flooding, flying debris, winds, etc.) Thunderstorms, high wind, hail, and lightning pose varying risk for Vernon County. Downbursts resulting from thunderstorms can be just as damaging as an EF-1 tornado. Thunderstorm winds have resulted in \$1.203M in property damage in Vernon County. Poorly built structures, barns, outbuildings are more vulnerable to the impact of high winds during thunderstorms. Both high winds and hail can damage roofs. Hail can also damage crops and dent cars and trucks. Total hail damage recorded in the NCEI database from 2013- 2018 has been \$550,000. Two hail events accounted for \$550,000 in damages in 2013 and 2017. Lightning can cause wildfires and structural fires, damage electrical utilities causing power outages, and sometimes fatalities.

#### Potential Losses to Existing Development

While past impacts have been relatively minimal, future disasters can cause extensive damage. There is a wide range of impact possible from a thunderstorm and wind speeds effect all structure types differently. Non-permanent and wood framed structures are very vulnerable to high winds in terms of destruction. While high winds are the force behind the damage, it is the windblown debris that causes the most damage.

#### Previous and Future Development

Due to the random nature of this hazard potential impacts of this hazard on future development is not quantifiable with the resources available.

#### Hazard Summary by Jurisdiction

Although thunderstorms/high winds/lightning/hail events are area-wide events, communities with a greater percentage of structures built prior to 1939 are considered to be more vulnerable to the impact of high wind and hail damage. The City of Nevada has the highest number of structures built prior to 1939, but the Village of Deerfield has the highest percentage overall. New construction and population growth would increase the exposure and risk to this hazard, but can be mitigated by IBC building code enforcement.

School districts with structures built prior to 1939 are considered to be more vulnerable to the impacts of high wind and hail damage.

#### Table 3.30. Percent of Housing Units Built in 1939 or Earlier

lurisdiction	Built 1939 or earlier #	Built 1939 or earlier %
Julisaiction	Duilt 1959 Of earlier #	Duilt 1959 Of earlier 76
Vernon County	17	0.4%
City of Bronaugh	6	9.4%
Village of Deerfield	4	16.0%
Village of Metz	2	2.7%
City of Nevada	312	9.3%
City of Richards	5	5.7%
City of Schell City	4	2.9%
City of Sheldon	17	15.6%
Village of Stotesbury	1	5.3%
City of Walker	9	6.1%

Sac Osage Electric Cooperative is more vulnerable to thunderstorms, high winds and lightening. High-

speed winds primarily knock over trees, especially when the ground is already saturated with water from rainfall and flooding. Fallen trees can damage or down distribution power lines, resulting in power outages. As the wind speed increases, distribution system asset damage becomes more widespread, system performance is degraded, and eventually, large areas and high percentages of customers may experience power outages. High winds can also damage components at the transmission level of the electric power system, denying service to distribution substations. Power grids and distribution substations are vulnerable to lightening and when struck, can cause outages, damage system performance, and even cause fires.

#### Problem Statement

Poorly built structures, barns, and outbuildings are more vulnerable to the impact of high winds during thunderstorms. High winds can topple utility poles and lead to power outages. Both high winds and hail can damage roofs. Hail can also damage crops and dent cars and trucks. People are also at risk to injury and death during high wind events. Crop insurance mitigates the risk to farmers and the agriculture sector within the county. Lightning events have caused structural fires and can strike electrical utilities leading to power outages.

The risk of property damage, injury, and death in the county can be mitigated by identifying safe refuge areas in public buildings, nursing homes and other facilities that house vulnerable populations that do not have a safe room. The purchasing and installation of NOAA weather radios in schools, government buildings and public areas may assist in providing early warning to allow for public to seek shelter during high wind events. Education and hazard awareness programs in public schools would also increase public safety in the event of severe thunderstorm events. Summarize the risks presented in the preceding analysis. Include a brief discussion of possible solutions, which could be brought forward into the strategy section in later analysis..

# 3.4.10 Tornado

Some specific sources for this hazard are:

- Enhanced F Scale for Tornado Damage, NWS, www.spc.noaa.gov/faq/tornado/ef-scale.html;
- Enhanced Fujita Scale's damage indicators and degrees of damage table, NOAA Storm Prediction Center, <u>www.spc.noaa.gov/efscale/ef-scale.html</u>;
- Tornado Activity in the U.S. map (1950-2006), FEMA 320, Taking Shelter from the Storm, 3rd edition;
- Tornado Alley in the U.S. map, <u>http://www.tornadochaser.net/tornalley.html</u>
- Enhanced Fujita Scale, www.spc.noaa.gov/efscale/ef-scale.html
- National Centers for Environmental Information, <u>http://www.NCEI.noaa.gov/stormevents/</u>
- Tornado History Project, map of tornado events, <u>http://www.tornadohistoryproject.com/tornado/Missouri</u>

#### Hazard Profile

#### Hazard Description

The NWS defines a tornado as "a violently rotating column of air extending from a thunderstorm to the ground." It is usually spawned by a thunderstorm and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. Often, vortices remain suspended in the atmosphere as funnel clouds. When the lower tip of a vortex touches the ground, it becomes a tornado.

Essentially, tornadoes are a vortex storm with two components of winds. The first is the rotational winds that can measure up to 500 miles per hour, and the second is an uplifting current of great strength. The dynamic strength of both these currents can cause vacuums that can overpressure structures from the inside.

Although tornadoes have been documented in all 50 states, most of them occur in the central United States due to its unique geography and presence of the jet stream. The jet stream is a high-velocity stream of air that separates the cold air of the north from the warm air of the south. During the winter, the jet stream flows west to east from Texas to the Carolina coast. As the sun moves north, so does the jet stream, which at summer solstice flows from Canada across Lake Superior to Maine. During its move northward in the spring and its recession south during the fall, the jet stream crosses Missouri, causing the large thunderstorms that breed tornadoes.

A typical tornado can be described as a funnel-shaped cloud in contact with the earth's surface that is "anchored" to a cloud, usually a cumulonimbus. This contact on average lasts 30 minutes and covers an average distance of 15 miles. The width of the tornado (and its path of destruction) is usually about 300 yards. However, tornadoes can stay on the ground for upward of 300 miles and can be up to a mile wide. The National Weather Service, in reviewing tornadoes occurring in Missouri between 1950 and 1996, calculated the mean path length at 2.27 miles and the mean path area at 0.14 square mile.

The average forward speed of a tornado is 30 miles per hour but may vary from nearly stationary to 70 miles per hour. The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Tornadoes are most likely to occur in the afternoon and evening, but have been known to occur at all hours of the day and night.

#### **Geographic Location**

Vernon County is located in a region where tornadoes can take place anywhere within the county Vernon County is also located in such a region where tornadoes can originate from another surrounding county and travel into Vernon County.

#### Severity/Magnitude/Extent

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one-mile-wide and 50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from water bodies. Tornadoes also can generate a tremendous amount of flying debris or "missiles," which often become airborne shrapnel that causes additional damage. If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and walls. However, the less spectacular damage is much more common.

Tornado magnitude is classified according to the EF- Scale (or the Enhance Fujita Scale, based on the original Fujita Scale developed by Dr. Theodore Fujita, a renowned severe storm researcher). The EF- Scale (see **Table 3.31**) attempts to rank tornadoes according to wind speed based on the damage caused. This update to the original F Scale was implemented in the U.S. on February 1, 2007.

<b>FUJITA</b>	SCALE		DERIVE	D EF SCALE	OPERATIONAL EF SCALE			
F	Fastest ¼-mile	3 Second Gust	EF	3 Second Gust	EF	3 Second Gust		
Number	(mph)	(mph)	Nu	(mph)	Number	(mph)		
0	40-72	45-78	0	65-85	0	65-85		
1	73-112	79-117	1	86-109	1	86-110		
2	113-157	118-161	2	110-137	2	111-135		
3	158-207	162-209	3	138-167	3	136-165		
4	208-260	210-261	4	168-199	4	166-200		
5	261-318	262-317	5	200-234	5	Over 200		

#### Table 3.31. Enhanced F Scale for Tornado Damage

Source: The National Weather Service, <u>www.spc.noaa.gov/faq/tornado/ef-scale.html</u>

The wind speeds for the EF scale and damage descriptions are based on information on the NOAA Storm Prediction Center as listed in **Table 3.32**. The damage descriptions are summaries. For the actual EF scale it is necessary to look up the damage indicator (type of structure damaged) and refer to the degrees of damage associated with that indicator. Information on the Enhanced Fujita Scale's damage indicators and degrees or damage is located online at www.spc.noaa.gov/efscale/ef-scale.html.

Enhance	Enhanced Fujita Scale											
	Wind Speed	Relative										
Scale	(mph)	Frequency	Potential Damage									
			Light. 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									
EF0	65-85	53.5%	remain in open fields) are always rated EF0).									
			Moderate. Roofs severely stripped; mobile homes overturned or									
			badly damaged; loss of exterior doors; windows and other glass									
EF1	86-110	31.6%	broken.									
			Considerable. Roofs torn off well-constructed houses; foundations									
			of frame homes shifted; mobile homes complete destroyed; large									
			trees snapped or uprooted; light object missiles generated; cars									
EF2	111-135	10.7%	lifted off ground.									
			Severe. Entire stores 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;									
EF3	136-165	3.4%	structures with weak foundations blown away some distance.									
			Devastating. Well-constructed houses and whole frame houses									
EF4	166-200	0.7%	completely levelled; cars thrown and small missiles generated.									
			Explosive. Strong frame houses levelled off foundations and swept									
			away; automobile-sized missiles fly through the air in excess of 300									
			ft.; steel reinforced concrete structure badly damaged; high rise									
			buildings have significant structural deformation; incredible									
EF5	>200	<0.1%	phenomena will occur.									

 Table 3.32.
 Enhanced Fujita Scale with Potential Damage

Source: NOAA Storm Prediction Center, http://www.spc.noaa.gov/efscale/ef-scale.html

Enhanced weather forecasting has provided the ability to predict severe weather likely to produce tornadoes days in advance. Tornado watches can be delivered to those in the path of these storms several hours in advance. Lead time for actual tornado warnings is about 30 minutes. Tornadoes have been known to change paths very rapidly, thus limiting the time in which to take shelter. Tornadoes may not be visible on the ground if they occur after sundown or due to blowing dust or driving rain and hail.

#### **Previous Occurrences**

**Table 3.33** includes NCEI reported tornado events and damages since 1993 in the planning area. Prior to that date, only really destructive tornadoes were recorded. It is necessary to go back as far as possible because of the random and intermittent nature of tornado events.

There are limitations to the use of NCEI tornado data that must be noted. For example, one tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered a separate segment for the purposes of reporting to the NCEI. Also, a tornado that lifts off the ground for less than 5 minutes or 2.5 miles is considered a separate segment. If the tornado lifts off the ground for greater than 5 minutes or 2.5 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database are in segments.

Table 3.33.	Recorded 7	<b>Fornadoes</b>	in Vernon	County,	1993 – Present

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
05/17/1995	5W Nevada	0-3 NW Dederick	14	400	F3	0	9	7.000M	0.00K
05/04/2003	3E Sheldon	3E Sheldon	0.2	20	F0	0	0	0.00K	0.00K
05/06/2006	37.9894.18	Fair Haven	0.2	20	F0	0	0	0.00K	0.00K
03/12/2006	3E Sheldon	12E Milo	11	100	F1	0	2	700.00K	0.00K
05/03/2006	16SW Nevada	2NW Bronaugh	7	50	F0	0	0	0.00K	0.00K
04/27/2007	0N Metz	0N Walker	12.92	25	EF0	0	0	10.00K	0.00K
03/31/2008	2E Moundville	2ENE Moundville	0.17	10	EF0	0	0	0.00K	0.00K
06/02/2008	0E Schell City	4SE Schell City	3.95	300	EF0	0	1	150.00K	0.00K
06/10/2009	4NNE Dederick	4NE Dederick	1.45	50	EF0	0	0	0.00K	0.00K
04/27/2014	5WSW Milo	4WSW Milo	0.34	100	EF0	0	0	0.00K	0.00K
08/19/2018	5SSE Montevallo	5SSE Montevallo	0.1	50	EF0	0	0	5.00K	0.00K
08/19/2018	2SE Sheldon	2SSW Rousertown	1.01	100	EF1	0	0	25.00K	0.00K
Totals						0	12	7.890M	0.00K

Source: National Centers for Environmental Information, http://www.NCEI.noaa.gov/stormevents/

Figure 3.31.



#### Probability of Future Occurrence

The future probability that a tornado will occur in Vernon County is 48% per year based on 12 events in 25 years. This data shows that about once every two (2) years a tornado event takes place somewhere in Vernon County.

#### **Vulnerability**

#### Vulnerability Overview

All jurisdictions in Vernon County are vulnerable to the effects of tornadoes. All above ground structures are vulnerable to the effects of a tornado and all hazards associated with them. According to NOAA, a tornado is a violently rotating column of air extending from a thunderstorm to the ground. Tornadoes may appear nearly transparent until dust and debris are picked up or a cloud forms within the funnel. The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Currently, none of the municipalities in Vernon County have FEMA 361 standard storm shelters. Figure 3.29 illustrates areas where dangerous tornadoes historically have occurred.



#### Figure 3.32. Tornado Alley in the U.S.

The current State Plan used a methodology to the vulnerability of each county in the state to determine each county's vulnerability to tornadoes. While this approach attempts to prioritize tornado vulnerable counties, it does not identify any particular geographic patterns to tornado risk. The state's

Source: http://www.tornadochaser.net/tornalley.html

analysis combined annualized losses and frequency of occurrence to determine the greatest likelihood of being impacted by a tornado. The state's vulnerability rating ranged from high, medium high, medium, medium low, and low. The vulnerability rating for Vernon County was rated at medium-high.

#### Potential Losses to Existing Development

While past impacts have been relatively minimal, future disasters can cause extensive damage. There is a wide range of impact possible from a tornado and wind speeds effect all structure types differently. Non-permanent and wood framed structures are very vulnerable to high winds in terms of destruction, while high winds are the force behind damage, it is the windblown debris that causes the most damage and deaths from a tornado.

#### Previous and Future Development

Development across the county and within incorporated jurisdictions increases the potential for losses. Future development and population increases will increase exposure to damage. It is anticipated that several communities will experience additional new development, but many use building codes which may help reduce the risk of building damage.

#### Hazard Summary by Jurisdiction

Although tornado events are area-wide hazard, communities with a greater percentage of structures built prior to 1939 are considered to be more vulnerable to the impact of high wind and hail damage.

School district facilities are at risk to the damages of tornadoes. No school districts in Vernon County have a FEMA rated shelter.

Sac Osage Electric Cooperative is at risk to the damages of tornadoes. There is no way to protect power lines and equipment during a tornado, and there are no FEMA rated shelters in Vernon County.

Jurisdiction	Built 1939 or earlier #	Built 1939 or earlier %
Vernon County	17	0.4%
City of Bronaugh	6	9.4%
Village of Deerfield	4	16.0%
Village of Metz	2	2.7%
City of Nevada	312	9.3%
City of Richards	5	5.7%
City of Schell City	4	2.9%
City of Sheldon	17	15.6%
Village of Stotesbury	1	5.3%
City of Walker	9	6.1%

Table 3.34.	Percent of Housing	Units Built in	1939 or Earlier

#### Problem Statement

Tornados are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one-mile-wide and 50 miles long. Tornado events in Vernon County have resulted in 12 injuries with no fatalities and \$7.890M in property damage over the last 25 years. Vernon County is rated at a medium-high in the current State Hazard Mitigation Plan. The risk of property damage, injury, and death in the county can be mitigated by the construction of FEMA safe rooms in new schools, daycares, and nursing homes. Additionally, encouraging the purchase and installation of NOAA weather radios, and promoting local severe weather alert applications for mobile communications can provide early warnings for severe weather which could result in lives saved. For communities that do not have the capacity to construct FEMA safe rooms, simply identifying and creating plans that identify strong, safe places in schools, large facilities, and other establishments serving the public may help in mitigating impacts of tornados.

# 3.4.11 Winter Weather/Snow/Ice/Severe Cold

Some specific sources for this hazard are:

- Wind chill chart, National Weather Service, <u>http://www.nws.noaa.gov/om/cold/wind\_chill.shtml;</u>
- Average Number of House per year with Freezing Rain, American Meteorological Society.
   "Freezing Rain Events in the United States." <u>http://ams.confex.com/ams/pdfpapers/71872.pdf;</u>
- USDA Risk Management Agency, Insurance Claims, <u>https://www.rma.usda.gov/data/cause</u>
- Any local Road Department data on the cost of winter storm response efforts.
- National Centers for Environmental Information, Storm Events Database, <u>http://www.NCEI.noaa.gov/stormevents/</u>

#### Hazard Profile

#### Hazard Description

A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

- **Blizzard**—Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than ¼ mile for at least three hours.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers**—Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- Freezing Rain—Measurable rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet**—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

#### **Geographic Location**

The entire United States of America is vulnerable to heavy snow, ice, extreme cold temperatures, and freezing rain. The map below (**Figure 3.30**) shows how many hours per year Vernon County is susceptible to receive freezing rain. Vernon County falls into the 8 - 12 hour demographic and on average receives 8 to 12 hours of freezing rain per year

#### Figure 3.33.



Source: American Meteorological Society. "Freezing Rain Events in the United States." http://ams.confex.com/ams/pdfpapers/71872.pdf

#### Severity/Magnitude/Extent

Severe winter storms include extreme cold, heavy snowfall, ice, and strong winds which can push the wind chill well below zero degrees in the planning area. Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. Ice can also become a problem on roadways if the air temperature is high enough that precipitation falls as freezing rain rather than snow.

Extreme cold often accompanies severe winter storms and can lead to hypothermia and frostbite in people without adequate clothing protection. Cold can cause fuel to congeal in storage tanks and supply lines, stopping electric generators. Cold temperatures can also overpower a building's heating system and cause water and sewer pipes to freeze and rupture. Extreme cold also increases the likelihood for ice jams on flat rivers or streams. When combined with high winds from winter storms, extreme cold becomes extreme wind chill, which is hazardous to health and safety.

The National Institute on Aging estimates that more than 2.5 million Americans are elderly and especially vulnerable to hypothermia, with the isolated elders being most at risk. About 10 percent of people over the age of 65 have some kind of bodily temperature-regulating defect, and 3-4 percent of all hospital patients over 65 are hypothermic.

Also at risk are those without shelter, those who are stranded, or who live in a home that is poorly insulated or without heat. Other impacts of extreme cold include asphyxiation (unconsciousness or death from a lack of oxygen) from toxic fumes from emergency heaters; household fires, which can be caused by fireplaces and emergency heaters; and frozen/burst pipes.

Buildings with overhanging tree limbs are more vulnerable to damage during winter storms when limbs fall. Businesses experience loss of income as a result of closure during power outages. In general, heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to determine. Businesses can experience loss of income as a result of closure during winter storms.

Overhead power lines and infrastructure are also vulnerable to damages from winter storms. In particular ice accumulation during winter storm events damage to power lines due to the ice weight on the lines and equipment. Damages also occur to lines and equipment from falling trees and tree limbs weighted down by ice. Potential losses could include cost of repair or replacement of damaged facilities, and lost economic opportunities for businesses.

Secondary effects from loss of power could include burst water pipes in homes without electricity during winter storms. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard. Standard values for loss of service for utilities reported in FEMA's 2009 BCA Reference Guide, the economic impact as a result of loss of power is \$126 per person per day of lost service.

Wind can greatly amplify the impact of cold ambient air temperatures. Provided by the National Weather Service, **Figure 3.31** below shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

			-																
									Tem	pera	ture	(°F)							
	Calm	40	35	30	25	20	15	10	5	0	-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	-35	-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
(H	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
d m	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
pu	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
Wi	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
					Frostb	ite Tir	nes	3	) minu	tes	10	) minut	es [	5 m	inutes				
			W	ind	Chill	(°F) = Whe	= 35. ere, T=	74 + Air Ter	0.62	15T ture (°	- 35. F) V=	75(V Wind S	0.16) . Speed	+ 0.4 (mph)	275	r(V <sup>0.</sup>	16) Effe	ective 1	1/01/0

#### Figure 3.34. Wind Chill Chart

Source: National Weather Service, http://www.nws.noaa.gov/om/cold/wind\_chill.shtml

Winter storms, cold, frost, and freezing grounds take a toll on crop production within Vernon County. **Table 3.32** shows the USDA's Risk Management Agency payments for insured crop losses in the planning area as a result of cold conditions and snow for the past 4 years.

Table 3.35.	Crop Insurance Claims Paid in Vernon County as a Result of Cold Conditions
and Sno	w 2014-2018

Crop			Insurance
Year	Crop Name	Cause of Loss Description	Paid
2014	Wheat	Freeze	\$69.00
2014	Wheat	Cold Winter	\$12.10
2014	Wheat	Cold Winter	\$129.30
2015	Forage Production	Cold Winter	\$2.70
2015	Forage Production	Cold Winter	\$39.70
2016	Wheat	Cold Winter	\$309.48
2017	Soybeans	Freeze	\$122.93
2017	Soybeans	Freeze	\$15.12
2017	Soybeans	Frost	\$144.19
2018	Wheat	Cold Winter	\$22.50

Source: USDA Risk Management Agency, https://www.rma.usda.gov/data/cause

#### **Previous Occurrences**

**Table 3.36** includes NCEI reported events and damages in Vernon County for the past 10 years. If few events are listed, go back further to 15 or 20 years. Vernon County has several occurrences of severe winter weather events over the past 10 years. All NCEI events that were reported for Vernon County are listed. The searchable NCEI events for Vernon County include blizzards, cold/wind chill, extreme cold/wind chill, heavy snow, ice storms, sleet, winter storms, and winter weather. The table below lists all events by event type, chronological order, magnitude, number of injuries, property damage and crop damages.

Table 3.36.	NCEI Vernon Count	y Winter Weather Events	s Summary, 2008-2018
-------------	-------------------	-------------------------	----------------------

Type of Event	Inclusive Dates	Magnitude		Property Damages	Crop Damages
		-	# of Injuries		
Ice Storm	2/11/2008	0	0	0	0
Ice Storm	2/21/2008	0	0	0	0
Winter Storm	1/26/2009	0	0	0	0
Winter Storm	3/27/2009	0	0	0	0
Winter Storm	12/24/2009	0	0	0	0
Winter Storm	3/20/2010	0	0	0	0
Blizzard	02/01/2011	0	0	0	0
Winter Storm	02/21/2013	0	0	0	0
Winter Storm	02/25/2013	0	0	0	0
Winter Storm	03/24/2013	0	0	0	0
Winter Storm	12/20/2013	0	0	0	0
Winter Storm	01/05/2014	0	0	0	0
Frost/Freeze	04/06/2018	0	0	0	0
		0	0	0	0

Source: NCEI, data accessed [3/14/2018]

Vernon County has had several occurrences of winter weather but the severity of each specific event has been minimal. According to the NCEI, each winter weather event that took place in Vernon County was very low in severity and no person was hurt and no properties or crops were damaged

due to these winter weather events.

#### Probability of Future Occurrence

Vernon County has a probability rate of 1.2; which shows that at least once a year in Vernon County there is expected to be a winter event that is severe enough to be recorded by the NCEI. The chances that there will be at least one recordable winter weather event in Vernon County is 100%.

#### **Vulnerability**

#### Vulnerability Overview

All jurisdictions in Vernon County are vulnerable to the effects of winter weather. All above ground structures are vulnerable to the effects of a winter weather and all hazards associated with it.

#### Potential Losses to Existing Development

While past impacts have been moderate, future disasters can cause extensive damage. There is a wide range of impact possible to structures, trees, vehicles and persons. Ice and snow pose hazards to roofs, due to the added weight and water associated with it. They also pose a significant threat to safety and life of the public, in the event that road conditions are bad.

#### Previous and Future Development

Development across the county and within incorporated jurisdictions increases the potential for losses. Future development and population increases will increase exposure to damage. It is anticipated that several communities will experience additional new development, but many use building codes which may help reduce the risk of building damage.

#### Hazard Summary by Jurisdiction

Although severe winter weather events are area-wide, communities with a greater percentage of structures built prior to 1939 are considered to be more vulnerable to the impact of snow and ice damage.

#### Table 3.37. Percent of Housing Units Built in 1939 or Earlier

Jurisdiction	Built 1939 or earlier #	Built 1939 or earlier %
Vernon County	17	0.4%
City of Bronaugh	6	9.4%
Village of Deerfield	4	16.0%
Village of Metz	2	2.7%
City of Nevada	312	9.3%
City of Richards	5	5.7%
City of Schell City	4	2.9%
City of Sheldon	17	15.6%
Village of Stotesbury	1	5.3%
City of Walker	9	6.1%

Severe winter weather can cause power outages and put structures at risk to fires when individuals in homes resort to fuel heaters. The risk of extreme cold deaths and frostbite varies among segments of the populations.

#### Problem Statement

Poorly built structures, barns, and outbuildings are more vulnerable to the impact of the weight and water associated with snow and ice. The weight can break utility lines and lead to power outages. Both snow and ice can damage roofs. People are also at risk to injury and death during these events, especially if they are out in the elements.

The risk of property damage, injury, and death in the county can be mitigated by identifying safe refuge areas in public buildings, nursing homes and other facilities that are element proof/resistant. The purchasing and installation of NOAA weather radios in schools, government buildings and public areas may assist in providing early warning to allow for public to seek shelter during winter events. Education and hazard awareness programs in public schools would also increase public safety in the event of severe events.

# 4 MITIGATION STRATEGY 4.1 4.1 Goals 4.1 4.2 Identification and Analysis of Mitigation Actions 4.2 4.3 Implementation of Mitigation Actions 4.6

44 CFR Requirement §201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section presents the mitigation strategy updated by the Mitigation Planning Committee (MPC) based on the [updated] risk assessment. The mitigation strategy was developed through a collaborative group process. The process included review of [updated] general goal statements to guide the jurisdictions in lessening disaster impacts as well as specific mitigation actions to directly reduce vulnerability to hazards and losses. The following definitions are taken from FEMA's *Local Hazard Mitigation Review Guide (October 1, 2012)*.

- **Mitigation Goals** are general guidelines that explain what you want to achieve. Goals are long-term policy statements and global visions that support the mitigation strategy. The goals address the risk of hazards identified in the plan.
- **Mitigation Actions** are specific actions, projects, activities, or processes taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan's mission and goals.

# 4.1 Goals

44 CFR Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

This planning effort is an update to Vernon County's existing hazard mitigation plan approved by FEMA on March 18, 2013. The goals from the 2013 Vernon County Hazard Mitigation Plan were reviewed to see if they were still valid, feasible, practical, and applicable to the defined hazard impacts. The MPC conducted a discussion session during their second meeting to review and update the plan goals. To ensure that the goals developed for this update were comprehensive and supported State goals, the 2013 State Hazard Mitigation Plan goals were reviewed. It was determined that while progress had been made on some of the 2013 actions, implementation of many actions had not occurred. This was largely because of the lack of resources.

Discussion of the previously approved goals involved determining the application of the goals to today and validity of the language used. It was determined that the goals did not meet the needs of Vernon County. The goals were updated to fit the county's needs and they are listed below. The MPC also opted to eliminate the objective statements, moving forward with broad goals and specific mitigation actions. Objectives seemed to add a layer of complication and potential
confusion. During this update process, the intent was to provide a usable set of actions that each jurisdiction was able to work towards partial or full implementation, and objectives seemed unnecessary.

The Plan update goals are as follows:

Goal 1: Protect the lives and livelihoods of all citizens.

Goal 2: Mitigate the effects of future natural hazards in the County.

Goal 3: Strengthen communication and awareness to coordinate participation between public agencies, citizens, non-profit organizations, business and industry.

Goal 4: Develop written policies and procedures for preparedness and mitigation response to natural disasters.

# 4.2 Identification and Analysis of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

During the second MPC meeting, the results of the risk assessment update were provided to the MPC members for review and the key issues were identified for specific hazards. Changes in risk since adoption of the previously approved plan were discussed. The second meeting concluded with the distribution of a list of possible mitigation actions to prompt discussions within and among the jurisdictions. The discussions occurred during jurisdictional break-out meetings. The list included possible new mitigation goals and actions, as well as actions from the previously approved plan. Actions from the previous plan included completed actions, on-going actions, and actions upon which progress had not been made, and or not measurable. The MPC discussed SEMA's identified funding priorities and the types of mitigation actions generally recognized by FEMA.

The MPC determined to include problem statements in the plan update at the end of each hazard profile, which had not been done in the previously approved plan. The problem statements summarize the risk to the planning area presented by each hazard, and include possible methods to reduce that risk. Use of the problem statements allowed the MPC to recognize new and innovative strategies for mitigate risks in the planning area.

The focus of Meeting #2 was update of the mitigation strategy. For a comprehensive range of mitigation actions to consider, the MPC reviewed the following information during Meeting #2:

- A list of actions proposed in the previous mitigation plan, the current State Plan, and approved plans in surrounding counties,
- Key issues from the risk assessments, including the Problem Statements concluding each hazard profile and vulnerability analysis,
- State priorities established for Hazard Mitigation Assistance grants, and
- Public input during meetings, responses to Data Collection Questionnaires, and other efforts to involve the public in the plan development process.

For Meeting #2, individual jurisdictions, including school and special districts, developed final mitigation strategy for submission to the MPC. They were encouraged to review the details of the risk

assessment vulnerability analysis specific to their jurisdiction. They were also provided a link to the FEMA's publication, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).* This document was developed by FEMA as a resource for identification of a range of potential mitigation actions for reducing risk to natural hazards and disasters.

The MPC reviewed the actions from the previously approved plan for progress made since the plan had been adopted, and decided to delete all current goals and actions from the previous update. The MPC concluded that the previous six goals were redundant and could be combined in to four goals instead of six. The MPC also concluded after reviewing the previous actions from the last plan update; that the actions were repetitive, unobtainable, or not measurable. The MPC elected to completely remove the old goals and actions from the current plan update and start over with new strategies that better align with SEMA and FEMA's funding priorities. Prior to Meeting #2, the list of actions for each jurisdiction was emailed to that jurisdiction's MPC representative along with the worksheets. Each jurisdiction was instructed to provide information regarding the "Action Status" with one of the following status choices:

- Completed, with a description of the progress,
- Not Started/Continue in Plan Update, with a discussion of the reasons for lack of progress,
- In Progress/Continue in Plan Update, with a description of the progress made to date or
- Deleted, with a discussion of the reasons for deletion.

Based on the status updates, there were 10 completed actions, 26 deleted actions, and 14 new/continuing actions.

Table 4.1 provides a summary of the action statuses for each jurisdiction:

Jurisdiction	Completed Actions	Deleted Actions	New/Continuing
	•		Actions
Vernon County	1.1.1; 1.1.2; 1.2.2;	1.1.1; 1.1.2; 1.2.1;	1.1; 2.1; 3.1; 4.1;
	1.2.3; 1.3.1; 1.3.2	1.2.2; 1.2.3; 1.3.1;	4.4
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2;	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
City of Bronaugh	1.1.1; 1.1.2; 1.2.2;	1.1.1; 1.1.2; 1.2.1;	1.1; 2.1; 3.2; 4.2;
	1.2.3; 1.3.1; 1.3.2	1.2.2; 1.2.3; 1.3.1;	4.4
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2;	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
Village of	1.1.1; 1.1.2; 1.2.2;	1.1.1; 1.1.2; 1.2.1;	1.1; 2.1; 3.2; 4.2
Deerfield	1.2.3; 1.3.1; 1.3.2	1.2.2; 1.2.3; 1.3.1;	
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2;	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
Village of Metz	1.1.1; 1.1.2; 1.2.2;	1.1.1; 1.1.2; 1.2.1;	1.1; 2.1; 3.2; 4.2
	1.2.3; 1.3.1; 1.3.2	1.2.2; 1.2.3; 1.3.1;	
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	

#### Table 4.1. Action Status Summary

	1	1	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2;	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
City of Nevada	1.1.1; 1.1.2; 1.2.2;	1.1.1; 1.1.2; 1.2.1;	1.2; 2.2; 2.4; 3.2;
	1.2.3; 1.3.1; 1.3.2	1.2.2; 1.2.3; 1.3.1;	4.3; 4.4
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1: 3.4.1: 4.1.1: 5.1.1: 5.1.2:	
		521.522.611.612.613	
Village of	1 1 1 1 1 2 1 2 2	1 1 1 1 1 2 1 2 1 2 1	1 1 2 1 3 2 1 7
Picharda	1.1.1, 1.1.2, 1.2.2,	1.1.1, 1.1.2, 1.2.1,	1.1, 2.1, 3.2, 4.2
Richards	1.2.3; 1.3.1; 1.3.2		
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2;	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
City of Schell City	1.1.1: 1.1.2: 1.2.2:	1.1.1: 1.1.2: 1.2.1:	1.1: 2.1: 3.2: 4.2
	123 131 132	122.123.131.	,, e,
	$222 \cdot 111 \cdot 512$	1 3 2 2 1 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 2 3	
	6 1 1	1.0.2, 2.1.1, 2.2.1, 2.2.2, 2.2.0,	
	0.1.1	2.3.1, 2.3.2, 3.1.1, 3.2.1, 3.2.2,	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
City of Sheldon	1.1.1; 1.1.2; 1.2.2;	1.1.1; 1.1.2; 1.2.1;	1.1; 2.1; 3.2; 4.2
	1.2.3; 1.3.1; 1.3.2	1.2.2; 1.2.3; 1.3.1;	
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1: 3.4.1: 4.1.1: 5.1.1: 5.1.2:	
		521:522:611:612:613	
Village of	111.1.1.2.1.2.2.	1 1 1 1 1 2 1 2 1	1 1 2 1 3 2 4 2
Stotosbury	1.1.1, 1.1.2, 1.2.2,	$1 \cdot 1 \cdot 1, 1 \cdot 1 \cdot 2, 1 \cdot 2 \cdot 1,$ $1 \cdot 2 \cdot 2 \cdot 1 \cdot 2 \cdot 2 \cdot 1 \cdot 2 \cdot 1$	1.1, 2.1, 3.2, 4.2
Stotesbuly	1.2.3, 1.3.1, 1.3.2	$1 \cdot 2 \cdot 2, 1 \cdot 2 \cdot 3, 1 \cdot 3 \cdot 3 \cdot 1, 1 \cdot 3 \cdot$	
	2.2.2, 4.1.1, 5.1.2,		
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2;	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
City of Walker	1.1.1; 1.1.2; 1.2.2;	1.1.1; 1.1.2; 1.2.1;	1.1; 2.1; 3.2; 4.2;
	1.2.3; 1.3.1; 1.3.2	1.2.2; 1.2.3; 1.3.1;	4.4
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2;	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
Bronaugh R-VII	1.1.1: 1.1.2: 1.2.2:	1.1.1: 1.1.2: 1.2.1:	1.3: 2.3: 3.2: 4.2
School District	1.2.3: 1.3.1: 1.3.2	1.2.2: 1.2.3: 1.3.1:	-, -, <b>-</b> , <b>-</b>
	$222 \cdot 411 \cdot 512$	1 3 2 2 1 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2	
	6 1 1	$231 \cdot 232 \cdot 311 \cdot 321 \cdot 321 \cdot 322 \cdot 311 \cdot 321 \cdot 322 \cdot 311 \cdot 322 \cdot 311 \cdot 321 \cdot 322 \cdot 311 \cdot 311 \cdot 322 \cdot 311 \cdot 322 \cdot 311 \cdot 311 \cdot 311 \cdot 322 \cdot 311 $	
	0.1.1	2.3.1, 2.3.2, 3.1.1, 3.2.1, 3.2.2, 3.1.1, 3.2.1, 3.2.2, 3.1, 3.2.2, 3.1, 3.2, 3.2, 3.2, 3.2, 3.2, 3.2, 3.2, 3.2	
		5.3.1, 5.4.1, 4.1.1, 5.1.1, 5.1.2,	
Neveds D.V		<u> </u>	
Nevada K-V	1.1.1; 1.1.2; 1.2.2;	1.1.1, 1.1.2, 1.2.1;	1.3, 2.3, 3.2, 4.2
School District	1.2.3; 1.3.1; 1.3.2	1.2.2; 1.2.3; 1.3.1;	
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2;	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
Sheldon R-VIII	1.1.1; 1.1.2; 1.2.2;	1.1.1; 1.1.2; 1.2.1;	1.3; 2.3; 3.2; 4.2
School District	1.2.3: 1.3.1: 1.3.2	1.2.2: 1.2.3: 1.3.1:	. , , ,
	2.2.2; 4.1.1; 5.1.2;	, -,,	

	6.1.1	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3; 2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2; 5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	
Sac Osage	1.1.1; 1.1.2; 1.2.2;	1.1.1; 1.1.2; 1.2.1;	1.4; 2.2; 3.2; 4.1
Electric Coop	1.2.3; 1.3.1; 1.3.2	1.2.2; 1.2.3; 1.3.1;	
	2.2.2; 4.1.1; 5.1.2;	1.3.2; 2.1.1; 2.2.1; 2.2.2; 2.2.3;	
	6.1.1	2.3.1; 2.3.2; 3.1.1; 3.2.1; 3.2.2;	
		3.3.1; 3.4.1; 4.1.1; 5.1.1; 5.1.2;	
		5.2.1; 5.2.2; 6.1.1; 6.1.2; 6.1.3	

**Table 4.2** Provides a summary of the completed and deleted actions from the previous plan.

# Table 4.2. Summary of Completed and Deleted Actions from the Previous Plan

Completed Actions	Completion Details (date, amount, funding source)
1.1.1	At least bi-annually, with local and federal funding
1.1.2	Done monthly (ongoing) local funding
1.2.1	Done regularly during events (ongoing)
1.2.2	Done though annual storm spotter training
1.3.1	Done at least annually (ongoing) partnering with local utilities
1.3.2	Done annually partnering with KBRPC and MoDOT (ongoing) Local, state,
	and federal funding
2.2.2	Ongoing, local funding
4.1.1	Ongoing monthly/annual trainings local, state, federal funding
5.1.2	Ongoing, required for schools, local, state and federal funding
6.1.1	Ongoing
<b>Deleted Actions</b>	Reason for Deletion
1.1.1	Redundant, not measureable or obtainable due to funding and community
	participation
1.1.2	Redundant, not measureable or obtainable due to funding and community
	participation
1.2.1	Redundant, not measureable or obtainable due to funding and community participation
1.2.2	Redundant, not measureable or obtainable due to funding and community
123	Redundant, not measureable or obtainable due to funding and community
1.2.0	narticination
131	Redundant not measureable or obtainable due to funding and community
1.0.1	participation
1.3.2	Redundant, not measureable or obtainable due to funding and community
	participation
2.1.1	Redundant, not measureable or obtainable due to funding and community
	participation
2.2.1	Redundant, not measureable or obtainable due to funding and community
	participation
2.2.2	Redundant, not measureable or obtainable due to funding and community
	participation

2.2.3	Redundant, not measureable or obtainable due to funding and community participation
2.3.1	Redundant, not measureable or obtainable due to funding and community participation
2.3.2	Redundant, not measureable or obtainable due to funding and community participation
3.1.1	Redundant, not measureable or obtainable due to funding and community participation
3.2.1	Redundant, not measureable or obtainable due to funding and community participation
3.2.2	Redundant, not measureable or obtainable due to funding and community participation
3.3.1	Redundant, not measureable or obtainable due to funding and community participation
3.4.1	Redundant, not measureable or obtainable due to funding and community participation
4.1.1	Redundant, not measureable or obtainable due to funding and community participation
5.1.1	Redundant, not measureable or obtainable due to funding and community participation
5.1.2	Redundant, not measureable or obtainable due to funding and community participation
5.2.1	Redundant, not measureable or obtainable due to funding and community participation
5.2.2	Redundant, not measureable or obtainable due to funding and community participation
6.1.1	Redundant, not measureable or obtainable due to funding and community participation
6.1.2	Redundant, not measureable or obtainable due to funding and community participation
6.1.3	Redundant, not measureable or obtainable due to funding and community participation

Source: Previously approved County Hazard Mitigation Plan; Data Collection Questionnaires.

For actions that have not been completed, the incomplete actions have either been combined with other actions, moved to a new goal, or are an ongoing continuous action at this time. Several actions have been implemented and are categorized as ongoing sustainable actions. The deleted actions were deemed unobtainable, not measureable, or redundant, by the MPC committee, due to either lack of funding or lack of community participation in the action. The committee has determined that writing and enforcing all jurisdictions to mandatorily do the deleted actions is out of their and other jurisdictional authority.

# 4.3 Implementation of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

Jurisdictional MPC members were encouraged to meet with others in their community to finalize the actions to be submitted for the updated mitigation strategy. Throughout the MPC consideration

and discussion, emphasis was placed on the importance of a benefit-cost analysis in determining project priority. The Disaster Mitigation Act requires benefit-cost review as the primary method by which mitigation projects should be prioritized. The MPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the Missouri State Hazard Mitigation Plan. The benefit/cost review at the planning stage primarily consisted of a qualitative analysis, and was not the detailed process required grant funding application. For each action, the plan sets forth a narrative describing the types of benefits that could be realized from action implementation. The cost was estimated as closely as possible, with further refinement to be supplied as project development occurs.

FEMA's STAPLEE methodology was used to assess the costs and benefits, overall feasibility of mitigation actions, and other issues impacting project. During the prioritization process, the MPC used worksheets to assign scores. The worksheets posed questions based on the STAPLEE elements as well as the potential mitigation effectiveness of each action. Scores were based on the responses to the questions as follows:

Definitely yes = 3 points Maybe yes = 2 points Probably no = 1 Definitely no = 0

The following questions were asked for each proposed action.

S: Is the action socially acceptable?

T: Is the action technically feasible and potentially successful?

A: Does the jurisdiction have the administrative capability to successfully implement this action?

P: Is the action politically acceptable?

L: Does the jurisdiction have the legal authority to implement the action?

E: Is the action economically beneficial?

E: Will the project have an environmental impact that is either beneficial or neutral? (score "3" if positive and "2" if neutral)

Will the implemented action result in lives saved? Will the implanted action result in a reduction of disaster damage?

The final scores are listed below in the analysis of each action. The worksheets are attached to this plan in the Appendix. The STAPLEE final score for each action, absent other considerations, such as a localized need for a project, determined the priority. Low priority action items were those that had a total score of between 0 and 24. Moderate priority actions were those scoring between 25 and 29. High priority actions scored 30 or above. A blank STAPLEE worksheet is shown in 0

# Figure 4.1. Blank STAPLEE Worksheet

	WITELT-JURISDICTIONAL		
	Loc	AL HAZARD	MITIGATION PLAN
Action Title:		Jurisdiction:	
Action ID:			
STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	3	Score
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?			
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			

# XXXXXX COUNTY MULTI JUDISDICTIONAL

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):

Priority Level: High (30+ points) Medium (25-29 points) Low (less than 25 points)

Completed by (name/title/phone #):

<u>Action 1.1</u>: Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet		
Name of Jurisdiction:	Vernon County	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency alert systems.	
Hazard(s) Addressed:	All	
	Action or Project	
Action/Project Number:	Vernon County 1.1	
Name of Action or Project:	Develop, install, and implement alert system	
Action or Project Description:	Secure funding to assist rural communities with purchasing updated and new notification systems to assist in preventing any injuries or deaths that could be sustained during inclement weather	
Applicable Goal Statement:	1	
Estimated Cost:	\$500,000.00	
Benefits:	Providing a line of defense from oncoming or potential disasters by	
	alerting the public to possible hazards.	
Plan for Implementation		
Responsible Organization/Department:	and sirens with the help of the County EMD as well as any county emergency personnel that has been appointed to help in the project.	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants	
Local Planning Mechanisms	County Emergency Plan, County Hazard Mitigation Plan, Budgetary	
to be Used in	Review Process	
Implementation, if any:		
Astism Otatus	Progress Report	
Action Status		
Report of Progress		

<u>Action 1.1:</u> Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet		
Name of Jurisdiction:	City of Bronaugh	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency alert systems.	
Hazard(s) Addressed:	All	
	Action or Project	
Action/Project Number:	Bronaugh 1.1	
Name of Action or Project:	Develop, install, and implement alert system	
Action or Project Description:	Secure funding to assist City of Bronaugh with purchasing updated and new notification systems to assist in preventing any injuries or deaths that could be sustained during inclement weather	
Applicable Goal Statement:	1	
Estimated Cost:	\$500,000.00	
Benefits:	Providing a line of defense from oncoming or potential disasters by alerting the public to possible hazards.	
	Plan for Implementation	
Responsible Organization/Department:	City Council, Mayor	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process	
	Progress Report	
Action Status	New	
Report of Progress		

<u>Action 1.1:</u> Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet	
Name of Jurisdiction:	Village of Deerfield
	Risk / Vulnerability
Problem being Mitigated:	Lack of emergency alert systems.
Hazard(s) Addressed:	All
	Action or Project
Action/Project Number:	Deerfield 1.1
Name of Action or Project:	Develop, install, and implement alert system
Action or Project Description:	Secure funding to assist Village of Deerfield with purchasing updated and new notification systems to assist in preventing any injuries or deaths that could be sustained during inclement weather
Applicable Goal Statement:	1
Estimated Cost:	\$500,000.00
Benefits:	Providing a line of defense from oncoming or potential disasters by alerting the public to possible hazards.
	Plan for Implementation
Responsible Organization/Department:	Village of Deerfield elected officials
Action/Project Priority:	High
Timeline for Completion:	2-5 years
Potential Fund Sources:	State and Federal grants
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process
	Progress Report
Action Status	New
Report of Progress	

<u>Action 1.1:</u> Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet	
Name of Jurisdiction:	Village of Metz
	Risk / Vulnerability
Problem being Mitigated:	Lack of emergency alert systems.
Hazard(s) Addressed:	All
	Action or Project
Action/Project Number:	Metz 1.1
Name of Action or Project:	Develop, install, and implement alert system
Action or Project Description:	Secure funding to assist Village of Metz with purchasing updated and new notification systems to assist in preventing any injuries or deaths that could be sustained during inclement weather
Applicable Goal Statement:	1
Estimated Cost:	\$500,000.00
Benefits:	Providing a line of defense from oncoming or potential disasters by alerting the public to possible hazards.
	Plan for Implementation
Responsible Organization/Department:	Village officials
Action/Project Priority:	High
Timeline for Completion:	2-5 years
Potential Fund Sources:	State and Federal grants
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process
	Progress Report
Action Status	New
Report of Progress	

<u>Action 1.1:</u> Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet	
Name of Jurisdiction:	City of Richards
	Risk / Vulnerability
Problem being Mitigated:	Lack of emergency alert systems.
Hazard(s) Addressed:	All
	Action or Project
Action/Project Number:	Richards 1.1
Name of Action or Project:	Develop, install, and implement alert system
	Secure funding to assist City of Richards with purchasing updated and
Action or Project	new notification systems to assist in preventing any injuries or deaths
Description:	that could be sustained during inclement weather
Applicable Goal Statement:	1
Estimated Cost:	\$500,000.00
Benefits:	Providing a line of defense from oncoming or potential disasters by
	alerting the public to possible hazards.
	Plan for Implementation
Responsible	City of Richards Mayor and council
Organization/Department:	
Action/Project Priority:	High
Timeline for Completion:	2-5 years
Potential Fund Sources:	State and Federal grants
Local Planning Mechanisms	County Emergency Plan, County Hazard Mitigation Plan, Budgetary
to be Used in	Review Process
Implementation, if any:	
	Progress Report
Action Status	New
Report of Progress	

<u>Action 1.1:</u> Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet		
Name of Jurisdiction:	Sac Osage Electric Cooperative	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of proper coordination during disasters	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Sac Osage 1.4	
Name of Action or Project:	Develop and improve lines of communication with emergency management agencies.	
Action or Project Description:	Maintain working relationships to reduce and prevent the impact of power outages. These include improvements to safety and reporting information, mutual aid agreements, and other efforts which seek to expand and improve both customer service and disaster planning.	
Applicable Goal Statement:	1	
Estimated Cost:	\$2,500.00	
Benefits:	Improvement to customer service and disaster planning	
	Plan for Implementation	
Responsible Organization/Department:	Operations Department	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 1.1:</u> Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet		
Name of Jurisdiction:	City of Sheldon	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency alert systems.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Sheldon 1.1	
Name of Action or Project:	Develop, install, and implement alert system	
Action or Project Description:	Secure funding to assist City of Sheldon with purchasing updated and new notification systems to assist in preventing any injuries or deaths that could be sustained during inclement weather	
Applicable Goal Statement:	1	
Estimated Cost:	\$500,000.00	
Benefits:	Providing a line of defense from oncoming or potential disasters by alerting the public to possible hazards.	
Plan for Implementation		
Responsible Organization/Department:	City Clerk, Mayor, City Council, Public Works	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 1.1:</u> Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet		
Name of Jurisdiction:	City of Schell City	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency alert systems.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Schell City 1.1	
Name of Action or Project:	Develop, install, and implement alert system	
Action or Project Description:	Secure funding to assist Schell City with purchasing updated and new notification systems to assist in preventing any injuries or deaths that could be sustained during inclement weather	
Applicable Goal Statement:	1	
Estimated Cost:	\$500,000.00	
Benefits:	Providing a line of defense from oncoming or potential disasters by alerting the public to possible hazards.	
	Plan for Implementation	
Responsible Organization/Department:	City Clerk, Mayor, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 1.1:</u> Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet		
Name of Jurisdiction:	Village of Stotesbury	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency alert systems.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Stotesbury 1.1	
Name of Action or Project:	Develop, install, and implement alert system	
Action or Project Description:	Secure funding to assist the Village of Stotesbury with purchasing updated and new notification systems to assist in preventing any injuries or deaths that could be sustained during inclement weather	
Applicable Goal Statement:	1	
Estimated Cost:	\$500,000.00	
Benefits:	Providing a line of defense from oncoming or potential disasters by alerting the public to possible hazards.	
Plan for Implementation		
Responsible Organization/Department:	Village of Stotesbury elected officials	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 1.1:</u> Participating jurisdictions will build and support local partnerships to continuously become less vulnerable to hazards.

Action Worksheet		
Name of Jurisdiction:	City of Walker	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency alert systems.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Walker 1.1	
Name of Action or Project:	Develop, install, and implement alert system	
Action or Project Description:	Secure funding to assist City of Walker with purchasing updated and new notification systems to assist in preventing any injuries or deaths that could be sustained during inclement weather	
Applicable Goal Statement:	1	
Estimated Cost:	\$500,000.00	
Benefits:	Providing a line of defense from oncoming or potential disasters by alerting the public to possible hazards.	
	Plan for Implementation	
Responsible Organization/Department:	City Clerk, Mayor, City Officials, Public Works	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 1.2:</u> Participating jurisdictions will ensure that 100% of all structures within the city limits are properly addressed.

Action Worksheet		
Name of Jurisdiction:	City of Nevada	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of adequate 911 addressing.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Nevada 1.2	
Name of Action or Project:	Develop a streamlined address system throughout the city.	
Action or Project Description:	Secure funding to develop and implement a streamlined address system throughout the city for quicker response in emergency situations or in the event structures are destroyed.	
Applicable Goal Statement:	1	
Estimated Cost:	\$2,500.00	
Benefits:	Provide accurate addressing in the event of a major national disaster while also allowing for quicker response time for emergency services.	
	Plan for Implementation	
Responsible Organization/Department:	Mayor, City Clerk, City Council, Public Works	
Action/Project Priority:	34 High	
Timeline for Completion:	1-2 years	
Potential Fund Sources:	State and Federal grants, local funds	
Local Planning Mechanisms	County Emergency Plan, County Hazard Mitigation Plan, Budgetary	
to be Used in	Review Process, Comprehensive Plan, Capital Improvement Plan	
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 1.3:</u> Participating jurisdictions will seek funding to provide adequate emergency shelters within the county.

Action Worksheet		
Name of Jurisdiction:	Bronaugh R-VII School District	
	Bisk / Vulnerability	
Problem being Mitigated:	Lack of emergency shelter for public during dangerous storms	
Hazard(s) Addressed:	Tornados, Thunderstorms, High Winds, Lightening, Hail	
Action or Project		
Action/Project Number:	Bronaugh R-VII School District 1.3	
Name of Action or Project:	Safe Room	
Action or Project Description:	Secure funding to build a community safe room.	
Applicable Goal Statement:	1	
Estimated Cost:	\$900,000	
Benefits:	Protect the lives of citizens in the event of a tornado, thunderstorm, high winds, lightening, and hail.	
Plan for Implementation		
Responsible Organization/Department:	Superintendent	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local funds	
Local Planning Mechanisms to be Used in Implementation, if any:	Budgetary Review Process, Master Plan, School Emergency Plan	
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 1.3:</u> Participating jurisdictions will seek funding to provide adequate emergency shelters within the county.

Action Worksheet		
Name of Jurisdiction:	Nevada R-V School District	
Name of ourisaletion.		
	Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency shelter for public during dangerous storms.	
Hazard(s) Addressed:	Tornados, Thunderstorms, High Winds, Lightening, Hail	
Action or Project		
Action/Project Number:	Nevada R-V School District 1.3	
Name of Action or Project:	Safe Room	
Action or Project Description:	Secure funding to build a community safe room.	
Applicable Goal Statement:	1	
Estimated Cost:	\$900,000	
Benefits:	Protect the lives of citizens in the event of a tornado, thunderstorm, high winds, lightening, and hail.	
	Plan for Implementation	
Responsible	Superintendent	
Organization/Department:		
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local funds	
Local Planning Mechanisms	Budgetary Review Process, Master Plan, Capital Improvement Plan,	
to be Used in	School Emergency Plan	
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 1.3:</u> Participating jurisdictions will seek funding to provide adequate emergency shelters within the county.

Action Worksheet		
Name of Jurisdiction:	Sheldon R-VIII School District	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency shelter for public during dangerous storms.	
Hazard(s) Addressed:	Tornados, Thunderstorms, High Winds, Lightening, Hail	
Action or Project		
Action/Project Number:	Sheldon R-VIII School District 1.3	
Name of Action or Project:	Safe Room	
Action or Project Description:	Secure funding to build a community safe room.	
Applicable Goal Statement:	1	
Estimated Cost:	\$900,000	
Benefits:	Protect the lives of citizens in the event of a tornado, thunderstorm, high winds, lightening, and hail.	
Plan for Implementation		
Responsible	Superintendent	
Action/Project Priority	Liab	
Timolino for Completion:		
Potential Fund Sources:	State and Federal grants, local funds	
Local Planning Mechanisms	Budgetary Review Process, Master Plan, School Emergency Plan	
to be Used in		
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Vernon County	
	Risk / Vulnerability	
Problem being Mitigated:	Improved drainage to prevent flooding.	
Hazard(s) Addressed:	Flood	
Action or Project		
Action/Project Number:	Vernon County 2.1	
Name of Action or Project:	Storm Draining	
Action or Project Description:	Secure funding to repair, replace, and upgrade drainage natural and manmade. Replace/install culverts and rectify low water crossings.	
Applicable Goal Statement:	2	
Estimated Cost:	Unknown	
Benefits:	Safer travel elimination of repeated repairs to roads and property.	
	Plan for Implementation	
Responsible Organization/Department:	Vernon County Commission, road and bridge, and public works department	
Action/Project Priority:	High	
Timeline for Completion:	5-10 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process, Flood	
to be Used in	Mitigation Assistance Plan, Transportation Plan	
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Bronaugh	
	Risk / Vulnerability	
Problem being Mitigated:	Improved drainage to prevent flooding.	
Hazard(s) Addressed:	Flood	
Action or Project		
Action/Project Number:	Bronaugh 2.1	
Name of Action or Project:	Storm Draining	
Action or Project Description:	Secure funding to repair, replace, and upgrade drainage natural and manmade. Replace/install culverts and rectify low water crossings.	
Applicable Goal Statement:	2	
Estimated Cost:	Unknown	
Benefits:	Safer travel elimination of repeated repairs to roads and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, City Council and Public Works Department	
Action/Project Priority:	High	
Timeline for Completion:	5-10 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process,	
to be Used in	Transportation Plan, Flood Mitigation Assistance Plan	
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Village of Deerfield	
	Risk / Vulnerability	
Problem being Mitigated:	Improved drainage to prevent flooding.	
Hazard(s) Addressed:	Flood	
Action or Project		
Action/Project Number:	Deerfield 2.1	
Name of Action or Project:	Storm Drainage	
Action or Project Description:	Secure funding to repair, replace, and upgrade drainage natural and manmade. Replace/install culverts and rectify low water crossings.	
Applicable Goal Statement:	2	
Estimated Cost:	Unknown	
Benefits:	Safer travel elimination of repeated repairs to roads and property.	
	Plan for Implementation	
Responsible Organization/Department:	Mayor, Village Clerk, City Council and Public Works Department	
Action/Project Priority:	High	
Timeline for Completion:	5-10 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process,	
to be Used in Implementation, if any:	I ransportation Plan	
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet	
Name of Jurisdiction:	Village of Metz
Risk / Vulnerability	
Problem being Mitigated:	Improved drainage to prevent flooding.
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	Metz 2.1
Name of Action or Project:	Storm Draining
Action or Project Description:	Secure funding to repair, replace, and upgrade drainage natural and manmade. Replace/install culverts and rectify low water crossings.
Applicable Goal Statement:	2
Estimated Cost:	Unknown
Benefits:	Safer travel elimination of repeated repairs to roads and property.
	Plan for Implementation
Responsible Organization/Department:	Mayor, Village Clerk, City Council and Public Works Department
Action/Project Priority:	High
Timeline for Completion:	5-10 years
Potential Fund Sources:	State and Federal grants, local dollars
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process,
to be Used in	Transportation Plan
Implementation, if any:	
Progress Report	
Action Status	New
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	City of Richards
	Risk / Vulnerability
Problem being Mitigated:	Improved drainage to prevent flooding.
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	Richard 2.1
Name of Action or Project:	Storm Draining
Action or Project Description:	Secure funding to repair, replace, and upgrade drainage natural and manmade. Replace/install culverts and rectify low water crossings.
Applicable Goal Statement:	2
Estimated Cost:	Unknown
Benefits:	Safer travel elimination of repeated repairs to roads and property.
	Plan for Implementation
Responsible Organization/Department:	Mayor, City Clerk, City Council and Public Works Department
Action/Project Priority:	High
Timeline for Completion:	5-10 years
Potential Fund Sources:	State and Federal grants, local dollars
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process,
to be Used in	Transportation Plan
Implementation, if any:	
Progress Report	
Action Status	New
Report of Progress	

Action Worksheet		
Name of Jurisdiction:	City of Schell City	
	Risk / Vulnerability	
Problem being Mitigated:	Improved drainage to prevent flooding.	
Hazard(s) Addressed:	Flood	
Action or Project		
Action/Project Number:	Schell City 2.1	
Name of Action or Project:	Storm Draining	
Action or Project Description:	Secure funding to repair, replace, and upgrade drainage natural and manmade. Replace/install culverts and rectify low water crossings.	
Applicable Goal Statement:	2	
Estimated Cost:	Unknown	
Benefits:	Safer travel elimination of repeated repairs to roads and property.	
	Plan for Implementation	
Responsible Organization/Department:	Mayor, City Clerk, City Council and Public Works Department	
Action/Project Priority:	High	
Timeline for Completion:	5-10 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process,	
to be Used in	Transportation Plan	
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Sheldon	
	Risk / Vulnerability	
Problem being Mitigated:	Improved drainage to prevent flooding.	
Hazard(s) Addressed:	Flood	
Action or Project		
Action/Project Number:	Sheldon 2.1	
Name of Action or Project:	Storm Draining	
Action or Project Description:	Secure funding to repair, replace, and upgrade drainage natural and manmade. Replace/install culverts and rectify low water crossings.	
Applicable Goal Statement:	2	
Estimated Cost:	Unknown	
Benefits:	Safer travel elimination of repeated repairs to roads and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, City Council, Public Works Department	
Action/Project Priority:	High	
Timeline for Completion:	5-10 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process,	
to be Used in	Transportation Plan, Comprehensive Plan	
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Village of Stotesbury	
	Risk / Vulnerability	
Problem being Mitigated:	Improved drainage to prevent flooding.	
Hazard(s) Addressed:	Flood	
Action or Project		
Action/Project Number:	Stotesbury 2.1	
Name of Action or Project:	Storm Draining	
Action or Project Description:	Secure funding to repair, replace, and upgrade drainage natural and manmade. Replace/install culverts and rectify low water crossings.	
Applicable Goal Statement:	2	
Estimated Cost:	Unknown	
Benefits:	Safer travel elimination of repeated repairs to roads and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, Village Clerk, City Council, Public Works	
Action/Project Priority:	High	
Timeline for Completion:	5-10 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process,	
to be Used in	Transportation Plan	
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet	
Name of Jurisdiction:	City of Walker
	Risk / Vulnerability
Problem being Mitigated:	Improved drainage to prevent flooding.
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	Walker 2.1
Name of Action or Project:	Storm Draining
Action or Project Description:	Secure funding to repair, replace, and upgrade drainage natural and manmade. Replace/install culverts and rectify low water crossings.
Applicable Goal Statement:	2
Estimated Cost:	Unknown
Benefits:	Safer travel elimination of repeated repairs to roads and property.
	Plan for Implementation
Responsible Organization/Department:	Mayor, City Clerk, City Council and Public Works Department
Action/Project Priority:	High
Timeline for Completion:	5-10 years
Potential Fund Sources:	State and Federal grants, local dollars
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process,
to be Used in	Transportation Plan
Implementation, if any:	
Progress Report	
Action Status	New
Report of Progress	

Action Worksheet		
Name of Jurisdiction:	City of Nevada	
	Risk / Vulnerability	
Problem being Mitigated:	Loss of utilities, and property	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Nevada 2.2	
Name of Action or Project:	Tree Trimming	
Action or Project Description:	Secure funding to develop and maintain a tree trimming program.	
Applicable Goal Statement:	2	
Estimated Cost:	\$40,000-\$50,000	
Benefits:	Less loss of utilities and property.	
	Plan for Implementation	
Responsible Organization/Department:	Mayor, City Clerk, City Council and Public Works Department	
Action/Project Priority:	High	
Timeline for Completion:	5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary Review Process,	
to be Used in	Comprehensive Plan	
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

Action 2.2: Participating jurisdictions will develop tree trimming and dead tree removal programs.

<u>Action 2.4:</u> Clean debris from drainage channels and under bridges to improve capacities of storm drainage systems.

Action Worksheet		
Name of Jurisdiction:	City of Nevada	
	Risk / Vulnerability	
Problem being Mitigated:	Buildup of debris in flood areas.	
Hazard(s) Addressed:	Flood	
Action or Project		
Action/Project Number:	Nevada 2.4	
Name of Action or Project:	Storm Water Impact	
Action or Project Description:	Clean debris from drainage channels and under bridges to improve capacities of storm drainage systems.	
Applicable Goal Statement:	2	
Estimated Cost:	\$500-\$7,000	
Benefits:	Improved public safety during hazard events; mitigate future damage.	
	Plan for Implementation	
Responsible Organization/Department:	City of Nevada EMD, Public Works, City Administration, Road and Bridge	
Action/Project Priority:	High	
Timeline for Completion:	3-5 Years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Hazard Mitigation Plan, Budgetary process, Flood Mitigation	
to be Used in	Assistance Plan,	
Implementation, if any:		
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Sac Osage Electric Cooperative	
Risk / Vulnerability		
Problem being Mitigated:	Loss of utilities, and property	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Sac Osage 2.2	
Name of Action or Project:	Tree Trimming	
Action or Project Description:	Secure funding to develop and maintain a tree trimming program.	
Applicable Goal Statement:	2	
Estimated Cost:	\$12,000,000,000 over a 5 year period	
Benefits:	Less loss of utilities and property.	
	Plan for Implementation	
Responsible Organization/Department:	Operations Department	
Action/Project Priority:	High	
Timeline for Completion:	5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

Action 2.2: Participating jurisdictions will develop tree trimming and dead tree removal programs.

Action Worksheet	
Name of Jurisdiction:	Bronaugh R-VII School District
Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency procedures to protect students and staff.
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	Bronaugh R-VII School District 2.3
Name of Action or Project:	Protect Critical Facilities
Action or Project Description:	Secure funding to develop and install a confidential emergency plan/flip chart for staff to be used in the event of a hazard.
Applicable Goal Statement:	2
Estimated Cost:	\$1,000-\$2,000.00
Benefits:	A uniform guide for staff to reference in the event of a hazard.
	Plan for Implementation
Responsible	Superintendent
Organization/Department:	
Action/Project Priority:	High
Timeline for Completion:	1 Year
Potential Fund Sources:	State and Federal grants, local dollars
Local Planning Mechanisms to be Used in Implementation, if any:	School Emergency Plan, Budgetary Review Process
Progress Report	
Action Status	New

Action 2.3: Participating jurisdictions will develop and install security measures at critical facilities.

Action Worksheet		
Name of Jurisdiction:	Nevada R-V School District	
Risk / Vulnerability		
Problem being Mitigated:	Lack of emergency procedures to protect students and staff.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Nevada R-V School District 2.3	
Name of Action or Project:	Protect Critical Facilities	
Action or Project Description:	Secure funding to develop and install a confidential emergency plan/flip chart for staff to be used in the event of a hazard.	
Applicable Goal Statement:	2	
Estimated Cost:	\$1,000-\$2,000.00	
Benefits:	A uniform guide for staff to reference in the event of a hazard.	
	Plan for Implementation	
Responsible	Superintendent	
Organization/Department:		
Action/Project Priority:	High	
Timeline for Completion:	1 Year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	School Emergency Plan, Budgetary Review Process	
Progress Report		
Action Status	New	

Action 2.3: Participating jurisdictions will develop and install security measures at critical facilities.

Action Worksheet	
Name of Jurisdiction:	Sheldon R-VIII School District
Risk / Vulnerability	
Problem being Mitigated:	Lack of emergency procedures to protect students and staff.
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	Sheldon R-VIII School District 2.3
Name of Action or Project:	Protect Critical Facilities
Action or Project Description:	Secure funding to develop and install a confidential emergency plan/flip chart for staff to be used in the event of a hazard.
Applicable Goal Statement:	2
Estimated Cost:	\$1,000-\$2,000.00
Benefits:	A uniform guide for staff to reference in the event of a hazard.
	Plan for Implementation
Responsible Organization/Department:	Superintendent
Action/Project Priority:	High
Timeline for Completion:	1 Year
Potential Fund Sources:	State and Federal grants, local dollars
Local Planning Mechanisms to be Used in Implementation, if any:	School Emergency Plan, Budgetary Review Process
Progress Report	
Action Status	New

Action 2.3: Participating jurisdictions will develop and install security measures at critical facilities.
Action Worksheet		
Name of Jurisdiction:	Vernon County	
	Risk / Vulnerability	
Problem being Mitigated:	Flood Depth Signage in deep water crossings.	
Hazard(s) Addressed:	Flood	
Action or Project		
Action/Project Number:	Vernon County 3.1	
Name of Action or Project:	County awareness systems	
Action or Project Description:	Secure funding to purchase and install signage for low water crossings to prevent potential drownings and trapped motor vehicles.	
Applicable Goal Statement:	3	
Estimated Cost:	\$15,000	
Benefits:	Providing a line of defense from oncoming or potential disasters.	
Plan for Implementation		
Responsible Organization/Department:	Vernon County Commission, County EMD	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Hazard Mitigation Plan, Budgetary Review Process, Flood Mitigation Assistance Plan	
Progress Report		
Action Status	New	
Report of Progress		

Action 3.1: Participating jurisdictions will secure funding for low-water crossing and depth signage.

Action Worksheet		
Name of Jurisdiction:	City of Bronaugh	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Bronaugh 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, Public Works Department, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Village of Deerfield	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Deerfield 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, Village Clerk, Public Works Department, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Village of Metz	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Metz 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, Village Clerk, Public Works Department, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Nevada	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Nevada 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, Public Works Department, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process, Capital Improvement Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Richards	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Richards 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, Public Works Department, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Schell City	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Schell City 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, Public Works Department, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Sheldon	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Sheldon	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, Public Works Department, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan Budgetary Review Process, Comprehensive Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Village of Stotesbury	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Stotesbury	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, Village Clerk, Public Works Department, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Walker	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Walker 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, Public Works Department, City Council	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Emergency Plan, County Hazard Mitigation Plan, Local	
to be Used in	Emergency Plan, Budgetary Review Process	
Implementation, if any:		
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Bronaugh R-VII School District	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Bronaugh R-VII School District 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Superintendent	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	Budgetary Review Process, School Emergency Plan, Master Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Nevada R-V School District	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Nevada R-V School District 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Superintendent	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	Budgetary Review Process, School Emergency Plan, Master Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Sheldon R-VIII School District	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Sheldon R-VIII School District 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Superintendent	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	Budgetary Review Process, School Emergency Plan, Master Plan	
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Sac Osage Electric Cooperative	
	Risk / Vulnerability	
Problem being Mitigated:	Communication in the event of natural hazards.	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Sac Osage 3.2	
Name of Action or Project:	Equipment Upgrades	
Action or Project Description:	Secure funding to purchase and install equipment upgrades for communications in the event of a hazard.	
Applicable Goal Statement:	3	
Estimated Cost:	\$1,000-\$15,000.00	
Benefits:	Better communication to reduce loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Operations Department	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 4.1:</u> Participating jurisdictions will work with entities to develop emergency plans to guard against loss of life from natural hazards.

Action Worksheet		
Name of Jurisdiction:	Vernon County	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disaster Plans and Practices	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Vernon County 4.1	
Name of Action or Project:	Natural Disaster Preparedness	
Action or Project Description:	Secure funding to develop and implement disaster plans for local entities.	
Applicable Goal Statement:	4	
Estimated Cost:	Unknown	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Vernon County Commission, EMD	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, County Hazard Mitigation Plan, Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

<u>Action 4.1:</u> Participating jurisdictions will work with entities to develop emergency plans to guard against loss of life from natural hazards.

Action Worksheet		
Name of Jurisdiction:	Sac Osage Electric Cooperative	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disaster Plans and Practices	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Sac Osage 4.1	
Name of Action or Project:	Natural Disaster Preparedness	
Action or Project Description:	Secure funding to develop and implement disaster plans for local entities.	
Applicable Goal Statement:	4	
Estimated Cost:	Unknown	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Operations Department	
Action/Project Priority:	High	
Timeline for Completion:	2-5 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, Budgetary Review Process	
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Bronaugh	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Bronaugh 4.2	
Name of Action or Project:	Coordinate drills	
Action or Project Description:	Coordinate and implement disaster drills.	
Applicable Goal Statement:	4	
Estimated Cost:	\$0-\$500.00	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, and Public Works Department	
Action/Project Priority:	High	
Timeline for Completion:	1 year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Village of Deerfield	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Deerfield 4.2	
Name of Action or Project:	Coordinate drills	
Action or Project Description:	Coordinate and implement disaster drills.	
Applicable Goal Statement:	4	
Estimated Cost:	\$0-\$500.00	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, Village Clerk, and Public Works Department	
Action/Project Priority:	High	
Timeline for Completion:	1 year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan	
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Village of Metz	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Metz 4.2	
Name of Action or Project:	Coordinate drills	
Action or Project Description:	Coordinate and implement disaster drills.	
Applicable Goal Statement:	4	
Estimated Cost:	\$0-\$500.00	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, Village Clerk, and Public Works Department	
Action/Project Priority:	High	
Timeline for Completion:	1 year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan	
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet	
Name of Jurisdiction:	City of Richards
	Risk / Vulnerability
Problem being Mitigated:	Natural Disasters
Hazard(s) Addressed:	All
	Action or Project
Action/Project Number:	Richards 4.2
Name of Action or Project:	Coordinate drills
Action or Project Description:	Coordinate and implement disaster drills.
Applicable Goal Statement:	4
Estimated Cost:	\$0-\$500.00
Benefits:	Reduction loss of life and property.
Plan for Implementation	
Responsible Organization/Department:	Mayor, City Clerk, City Officials
Action/Project Priority:	High
Timeline for Completion:	1 year
Potential Fund Sources:	State and Federal grants, local dollars
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan
Progress Report	
Action Status	New
Report of Progress	

Action Worksheet		
Name of Inviodiction.		
Name of Jurisdiction:	City of Schell City	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Schell City 4.2	
Name of Action or Project:	Coordinate drills	
Action or Project Description:	Coordinate and implement disaster drills.	
Applicable Goal Statement:	4	
Estimated Cost:	\$0-\$500.00	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk City Officials	
Action/Project Priority:	High	
Timeline for Completion:	1 year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms	County Emergency Plan	
Implementation, if any:		
Progress Report		
Action Status	New	
Report of Progress		

Action Worksheet	
Name of Jurisdiction:	City of Sheldon
	Risk / Vulnerability
Problem being Mitigated:	Natural Disasters
Hazard(s) Addressed:	All
	Action or Project
Action/Project Number:	Sheldon 4.2
Name of Action or Project:	Coordinate drills
Action or Project Description:	Coordinate and implement disaster drills.
Applicable Goal Statement:	4
Estimated Cost:	\$0-\$500.00
Benefits:	Reduction loss of life and property.
Plan for Implementation	
Responsible Organization/Department:	Mayor, City Clerk, City Officials
Action/Project Priority:	High
Timeline for Completion:	1 year
Potential Fund Sources:	State and Federal grants, local dollars
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan
	Progress Report
Action Status	New
Report of Progress	

Action Worksheet		
Name of Jurisdiction:	Village of Stotesbury	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Stotesbury 4.2	
Name of Action or Project:	Coordinate drills	
Action or Project Description:	Coordinate and implement disaster drills.	
Applicable Goal Statement:	4	
Estimated Cost:	\$0-\$500.00	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, Village Clerk, Village Officials	
Action/Project Priority:	High	
Timeline for Completion:	1 year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Walker	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
Action or Project		
Action/Project Number:	Walker 4.2	
Name of Action or Project:	Coordinate drills	
Action or Project Description:	Coordinate and implement disaster drills.	
Applicable Goal Statement:	4	
Estimated Cost:	\$0-\$500.00	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Mayor, City Clerk, and City Officials	
Action/Project Priority:	High	
Timeline for Completion:	1 year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Bronaugh R-VII School District	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
	Action or Project	
Action/Project Number:	Bronaugh R-VII School District 4.2	
Name of Action or Project:	Coordinate drills	
Action or Project Description:	Coordinate and implement disaster drills.	
Applicable Goal Statement:	4	
Estimated Cost:	\$0-\$500.00	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Superintendent	
Action/Project Priority:	High	
Timeline for Completion:	1 year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, School Emergency Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Nevada R-V School District	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
	Action or Project	
Action/Project Number:	Nevada R-V School District 4.2	
Name of Action or Project:	Coordinate drills	
Action or Project Description:	Coordinate and implement disaster drills.	
Applicable Goal Statement:	4	
Estimated Cost:	\$0-\$500.00	
Benefits:	Reduction loss of life and property.	
	Plan for Implementation	
Responsible Organization/Department:	Superintendent	
Action/Project Priority:	High	
Timeline for Completion:	1 vear	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, School Emergency Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	Sheldon R-VIII School District	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
	Action or Project	
Action/Project Number:	Sheldon R-VIII School District 4.2	
Name of Action or Project:	Coordinate drills	
Action or Project Description:	Coordinate and implement disaster drills.	
Applicable Goal Statement:	4	
Estimated Cost:	\$0-\$500.00	
Benefits:	Reduction loss of life and property.	
Plan for Implementation		
Responsible Organization/Department:	Superintendent	
Action/Project Priority:	High	
Timeline for Completion:	1 year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, School Emergency Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action Worksheet		
Name of Jurisdiction:	City of Nevada	
	Risk / Vulnerability	
Problem being Mitigated:	Natural Disasters	
Hazard(s) Addressed:	All	
	Action or Project	
Action/Project Number:	Nevada 4.3	
Name of Action or Project:	Emergency Operation Center Identification	
Action or Project Description:	Identify and locate Emergency Operation Centers in the area.	
Applicable Goal Statement:	4	
Estimated Cost:	\$1,000-\$1,500.00	
Benefits:	Eliminate confusion on where Emergency Operation Centers are located and who should be present during an emergency.	
Plan for Implementation		
Responsible Organization/Department:	City of Nevada EMD	
Action/Project Priority:	High	
Timeline for Completion:	1 year	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Plan, Budgetary Review Process	
	Progress Report	
Action Status	New	
Report of Progress		

Action 4.3: Participating jurisdictions will locate and identify Emergency Operation Centers.

Action 4.4: Participating jurisdiction	s will identify and partic	cipate in floodplain id	dentification and
mapping.			

Action Worksheet		
Name of Jurisdiction:	Vernon County	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of knowledge pertaining to 100 and 500 year floodplains locations and development in floodplains.	
Hazard(s) Addressed:	Flood	
	Action or Project	
Action/Project Number:	Vernon County 4.4	
Name of Action or Project:	Prevent future development of public facilities in flood hazard areas and protect critical facilities.	
Action or Project Description:	Identify and participate in floodplain identification and mapping to prevent future development of public facilities in flood hazard areas and ensure protection of critical facilities	
Applicable Goal Statement:	4	
Estimated Cost:	\$500-\$5,000	
Benefits:	Protection of critical facilities and prevention of flood damages.	
	Plan for Implementation	
Responsible Organization/Department:	Vernon County EMD, County Commission	
Action/Project Priority:	High	
Timeline for Completion:	1-3 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Hazard Mitigation Plan, Flood Mitigation Assistance Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action 4.4: Participating jurisdictions	s will identify a	and participate in	floodplain	identification and	Ł
mapping.					

Action Worksheet		
Name of Jurisdiction:	City of Bronaugh	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of knowledge pertaining to 100 and 500 year floodplains locations and development in floodplains.	
Hazard(s) Addressed:	Flood	
	Action or Project	
Action/Project Number:	Bronaugh 4.4	
Name of Action or Project:	Prevent future development of public facilities in flood hazard areas and protect critical facilities.	
Action or Project Description:	Identify and participate in floodplain identification and mapping to prevent future development of public facilities in flood hazard areas and ensure protection of critical facilities	
Applicable Goal Statement:	4	
Estimated Cost:	\$500-\$5,000	
Benefits:	Protection of critical facilities and prevention of flood damages.	
Plan for Implementation		
Responsible Organization/Department:	City Council, Mayor, Public Works	
Action/Project Priority:	High	
Timeline for Completion:	1-3 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in	County Hazard Mitigation Plan, Flood Mitigation Assistance Plan	
implementation, if any:	Brogross Poport	
Action Status		
Report of Progress		
Report of Flogress		

Action 4.4: Participating jurisdiction	s will identify and partic	cipate in floodplain id	dentification and
mapping.			

Action Worksheet		
Name of Jurisdiction:	City of Nevada	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of knowledge pertaining to 100 and 500 year floodplains locations and development in floodplains.	
Hazard(s) Addressed:	Flood	
	Action or Project	
Action/Project Number:	City of Nevada 4.4	
Name of Action or Project:	Prevent future development of public facilities in flood hazard areas and protect critical facilities.	
Action or Project Description:	Identify and participate in floodplain identification and mapping to prevent future development of public facilities in flood hazard areas and ensure protection of critical facilities	
Applicable Goal Statement:	4	
Estimated Cost:	\$500-\$5,000	
Benefits:	Protection of critical facilities and prevention of flood damages.	
	Plan for Implementation	
Responsible Organization/Department:	City of Nevada EMD, City Administration, City Council	
Action/Project Priority:	High	
Timeline for Completion:	1-3 years	
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Hazard Mitigation Plan, Budgetary Review Process, Flood Mitigation Assistance Plan, Capital Improvement Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action 4.4: Participating jurisdiction	s will identify and partic	cipate in floodplain id	dentification and
mapping.			

Action Worksheet		
Name of Jurisdiction:	City of Walker	
	Risk / Vulnerability	
Problem being Mitigated:	Lack of knowledge pertaining to 100 and 500 year floodplains locations and development in floodplains.	
Hazard(s) Addressed:	Flood	
	Action or Project	
Action/Project Number:	City of Walker 4.4	
Name of Action or Project:	Prevent future development of public facilities in flood hazard areas and protect critical facilities.	
Action or Project Description:	Identify and participate in floodplain identification and mapping to prevent future development of public facilities in flood hazard areas and ensure protection of critical facilities	
Applicable Goal Statement:	4	
Estimated Cost:	\$500-\$5,000	
Benefits:	Protection of critical facilities and prevention of flood damages.	
	Plan for Implementation	
Responsible	City Council, Mayor, Public Works	
Action/Department:	High	
Timeline for Completion:		
Potential Fund Sources:	State and Federal grants, local dollars	
Local Planning Mechanisms to be Used in Implementation, if any:	County Hazard Mitigation Plan, Budgetary Process, Flood Mitigation Assistance Plan	
	Progress Report	
Action Status	New	
Report of Progress		

# **5 PLAN MAINTENANCE PROCESS**

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This chapter provides an overview of the overall strategy for plan maintenance and outlines the method and schedule for monitoring, updating and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

## 5.1 Monitoring, Evaluating, and Updating the Plan

44 CFR Requirement 201.6(c)(4): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

#### 5.1.1 Responsibility for Plan Maintenance

The Mitigation Planning Committee (MPC) has served as the advisory body during the plan update process, but is not a standing committee. Many MPC representatives and stakeholders are also represented on the Local Emergency Planning Committee (LEPC), as well as several other committees and groups in Vernon County. Kaysinger Basin Regional Planning Commission will be responsible for overseeing the plan monitoring, evaluation and maintenance of the Plan. However, it will be up to the County Commission, Office of Emergency Management, and the local jurisdictions to carry out the goals and actions outlined. Maintenance will involve agreement of the participating jurisdictions, including schools and special districts to:

- Meet annually, and after a disaster event, to monitor and evaluate the implementation of the plan;
- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high priority, low- or no-cost recommended actions;
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;

- Report on plan progress and recommended changes to the County Board of Supervisors and governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

#### 5.1.2 Plan Maintenance Schedule

The MPC agrees to meet annually and after a state or federally declared hazard event as appropriate to monitor progress and update the mitigation strategy. Kaysinger Basin Regional Planning Commission will be responsible for initiating the plan reviews and will invite members of the MPC to the meeting.

In coordination with all participating jurisdictions, a five-year written update of the plan will be submitted to the Missouri State Emergency Management Agency (SEMA) and FEMA Region VII per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule.

#### 5.1.3 Plan Maintenance Process

Progress on the proposed actions can be monitored by evaluating changes in vulnerabilities identified in the plan. The MPC during the annual meeting should review changes in vulnerability identified as follows:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions,
- Increased vulnerability due to hazard events, and/or
- Increased vulnerability as a result of new development (and/or annexation).

Future 5-year updates to this plan will include the following activities:

- Consideration of changes in vulnerability due to action implementation,
- Documentation of success stories where mitigation efforts have proven effective,
- Documentation of unsuccessful mitigation actions and why the actions were not effective,
- Documentation of previously overlooked hazard events that may have occurred since the previous plan approval,
- Incorporation of new data or studies with information on hazard risks,
- Incorporation of new capabilities or changes in capabilities,
- Incorporation of growth data and changes to inventories, and
- Incorporation of ideas for new actions and changes in action prioritization.

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

- Each proposed action in the plan identified an individual, office, or agency responsible for action implementation. This entity will track and report on an annual basis to Kaysinger Basin Regional Planning Commission on action status. The entity will provide input on whether the action as implemented meets the defined objectives and is likely to be successful in reducing risk.
- If the action does not meet identified objectives, the jurisdictional MPC will determine

necessary remedial action, making any required modifications to the plan.

Changes will be made to the plan to remedy actions that have failed or are not considered feasible. Feasibility will be determined after a review of action consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring of this plan. Updating of the plan will be accomplished by written changes and submissions, as the MPC deems appropriate and necessary. Changes will be approved by the Vernon County Commissioners and the governing boards of the other participating jurisdictions.

### **5.2** Incorporation into Existing Planning Mechanisms

# 44 CFR Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Where possible, plan participants, including school and special districts, will use existing plans and/or programs to implement hazard mitigation actions. Those existing plans and programs were described in Section 2.2 of this plan. Based on the capability assessments of the participating jurisdictions, communities in Vernon County will continue to plan and implement programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through the following plans:

- General or master plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Vernon County Emergency Operations Plan;
- Capital improvement plans and budgets;
- Other community plans within the County, such as water conservation plans, storm water management plans, and parks and recreation plans;
- School and Special District Plans and budgets; and
- Other plans and policies outlined in the capability assessment sections for each jurisdiction in Chapter 2 of this plan.

The MPC members involved in updating these existing planning mechanisms will be responsible for integrating the findings and actions of the mitigation plan, as appropriate. The MPC is also responsible for monitoring this integration and incorporation of the appropriate information into the five-year update of the multi-jurisdictional hazard mitigation plan.

Additionally, after the annual review of the Hazard Mitigation Plan, Kaysinger Basin Regional Planning Commission will provide the updated Mitigation Strategy with current status of each mitigation action to the County Commissioners as well as all Mayors, City Clerks, and School District Superintendents. Kaysinger Basin Regional Planning Commission will request that the mitigation strategy be incorporated, where appropriate, in other planning mechanisms.

**Table 5.1.1** below lists the planning mechanisms by jurisdiction into which the Hazard MitigationPlan will be integrated.

Jurisdiction	Planning Mechanisms	Integration Process for Previous Plan	Integration Process for Current Plan
Unincorporated Vernon County	County Emergency Operations Plan Economic Development Plan Transportation Plan Land-use Plan Flood Mitigation Assistance Plan Floodplain Ordinance	Cleared ditches Replaced culverts Floodplain enforcement	Annual Budget County Emergency Operations Plan Flood Mitigation Assistance Plan Floodplain Ordinance
City of Bronaugh	Transportation Plan Land-use Plan Flood Mitigation Plan Building Code Ordinance Floodplain Ordinance	Cleared ditches Building Code Enforcement Floodplain enforcement	Annual Budget Flood Mitigation Plan Floodplain Ordinance
Village of Deerfield	Transportation Plan Economic Development Plan	None-limited staff & funding	Annual budget
Village of Metz	Economic Development Plan Transportation Plan	Did not participate	Annual budget
City of Nevada	Comprehensive Plan Capital Improvement Plan Local Emergency Operations Plan County Emergency Operations Plan Transportation Plan Land-use Plan Flood Mitigation Assistance Plan Zoning Ordinance Building Code Ordinance Floodplain Ordinance Nuisance Ordinance Storm Water Ordinance Drainage Ordinance Site Plan Review Requirements	Cleared ditches Replaced culverts Reinforced City Ordinances NFIP regulation enforcement	Annual budget Building Code Emergency Operations Plan Floodplain Ordinance Comprehensive Plan
City of Richards	Local Emergency Operations Plan	None-limited staff & funding	Annual budget
City of Schell City	Transportation Plan Nuisance Ordinance	Nuisance Ordinance enforcement	Annual budget Nuisance Ordinance
City of Sheldon	Comprehensive Plan Transportation Plan Building Code Ordinance	New building regulations adopted	Building Code ordinance Annual budget Comprehensive Plan
Village of Stotesbury	Transportation Plan	Did not participate	Annual Budget
City of Walker	Local Emergency Operations Plan Transportation Plan Nuisance Ordinance	Did not participate	Annual Budget Nuisance Ordinance
Bronaugh R- VII School District	Master Plan School Emergency Plan Weapons Policy	Ongoing plan review	Annual budget Master plan School Emergency Plan
Nevada R-V School District	Master Plan Capital Improvement Plan School Emergency Plan Weapons Policy	Alert system updates Ongoing plan review Evacuation routes improved	Annual Budget Master Plan School Emergency Plan Capital Improvement Plan
Sheldon R-VIII School District	Master Plan School Emergency Plan Weapons Policy	Evacuation routes improved Ongoing plan review	Annual Budget Master Plan School Emergency Plan
Sac Osage Electric Cooperative	Comprehensive Plan	I rees trimmed	Annual Budget Comprehensive Plan

#### Table 5.1 Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

The planning committee members involved in updating these existing planning mechanisms will be
responsible for integrating the findings and actions of the mitigation plan, as appropriate. The committee members are also responsible for monitoring this integration and incorporation of the appropriate information into the five-year update of the multi-jurisdictional hazard mitigation plan. Including hazard mitigation is now routine for any planning projects or plan updates carried out by the Kaysinger Basin Regional Planning Commission (KBRPC). Applicable goals and action items from hazard mitigation plans have been incorporated into the regional transportation plan as well as the Community Economic Development Strategy for the region. Both of these documents are resources for cities and counties within the seven county area and are updated on a regular basis with input from city and county representatives. This review and update process has helped city and county representatives better understand and appreciate the importance of including hazard mitigation in all applicable plans. In addition, KBRPC and the hazard mitigation planning committee are also working to encourage the incorporation of hazard mitigation into the planning activities of all local governments, school districts, and local entities through presentations and participation in planning activities.

## **5.3 Continued Public Involvement**

## 44 CFR Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

The hazard mitigation plan update process provides an opportunity to publicize success stories resulting from the plan's implementation and seek additional public comment. Information about the annual reviews will be posted in the local newspaper as well as on Kaysinger Basin Regional Planning Commission's website following each annual review of the mitigation plan. When the MPC reconvenes for the five-year update, it will coordinate with all stakeholders participating in the planning process. Included in this group will be those who joined the MPC after the initial effort, to update and revise the plan. Public notice will be posted and public participation will be actively solicited, at a minimum, through available website postings and press releases to local media outlets, primarily newspapers.